Local Unit Alignment, Reorganization, and Consolidation Commission

Literature Review and Analysis Related to Optimal Municipal Size and Efficiency

Marc Holzer, Ph.D.
Principal Investigator

John Fry
Project Director

Etienne Charbonneau
Deputy Project Director

Gregg Van Ryzin, Ph.D.
Supervising Faculty

Etienne Charbonneau
Tiankai Wang
Senior Research Associate

Eileen Burnash
Librarian

RUTGERS
NEWARK
SCHOOL OF PUBLIC AFFAIRS AND ADMINISTRATION
SPAA
competence || diversity || knowledge || service

May 6, 2009

TABLE OF CONTENTS

Literature Review and Analysis Related to Optimal Municipal Size and Efficiency

EXECUTIVE SUMMARY

The Local Unit Alignment, Reorganization, and Consolidation Commission (LUARCC) contracted with the School of Public Affairs and Administration (SPAA) at Rutgers University, Newark campus in October of 2008 to conduct a review of the literature and prepare a report on *optimal size and municipal efficiency*. Policymakers generally believe that larger municipalities exhibit greater efficiency.

There is a healthy literature on municipal size and the efficiency of the delivery of municipal services. The belief that larger size governments would be more efficient has motivated much of this work and, further, has motivated the call for consolidation to cure the supposed inefficiencies. The literature provides little support for the size and efficiency relationship, and, therefore, little support for the action of consolidation, except as warranted on a case-by-case basis.

- There is little overall correlation between size and efficiency for municipalities with populations between 25,000 and 250,000.
- The literature does suggest that smaller municipalities (population under 25,000) are less efficient, but details are important.
- Much of the literature argues that small municipalities are not less efficient, except in specialized services.
- Increasing size is related to increased efficiency in capital-intensive services such as utility systems or public works.
- For labor-intensive services, such as police work, an increase in size is related to a decrease in efficiency − smaller units are more efficient than larger units are.
- Larger municipalities with populations over 250,000 are clearly less efficient.
- The literature suggests that cost per capita may not be a good measure of efficiency or performance because of the distorting effect of other factors. Yet, studies use this measure commonly.

Overall, the literature addressed the relationship between size and efficiency that was the basic question of the scope of work. Although the findings are somewhat inconsistent, two main substantive conclusions and one technical point stand out:

- There is an inverted U-shaped relationship between size and efficiency on a general level. Efficiency increases with population size up to about 25,000 people, at which point it is stable until about 250,000 people, and declines with population after that. In essence, the curve states that the smallest and largest municipalities are least efficient.
- The (inverted) U-shaped relationship is not consistent when evaluating specific service types.

- There are many distorting influences on cost per capita as a measure of efficiency, leading to a serious lack of comparability between jurisdictions.

The literature does not address most of the municipal characteristics enumerated in the scope of work.

<u>Questions from the Scope of Work on *Optimal Municipal Size and Efficiency*</u>

Purpose of the Literature Review:
Is there an optimal size or range of sizes for a municipal government entity from the standpoint of efficiency and to minimize duplication of efforts? Are there diseconomies of scale associated with larger governments requiring proportionally more administration?

> *The literature identifies a broad range of population between 25,000 and 250,000 as the most efficient. There are diseconomies of scale beyond 250,000 people. Small municipalities, those under 25,000, are less efficient only when services are specialized or capital intensive.*

Evaluate and rank the effect of population density (a pattern of sprawl versus compactness)

> *The findings in the literature are neither consistent nor strong about the relationship between population density and efficiency.*

Evaluate and rank the effect of demographic characteristics of the population (wealth, poverty, age characteristics, education level, demand for services)

> *The literature does not generally study population characteristics as determinants of municipal efficiency, but in explaining the weak effects of size on efficiency there was some evidence that wealth is a factor because of increased demands for quality of service. Isolated findings that very old and very young populations show lesser costs per capita and that economically deprived populations show higher costs (in library services) are too infrequent in the literature to be considered significant.*

Evaluate and rank the effect of the extent to which important services are regionalized (for example, schools, the existence of regional utilities and emergency service compacts which limit municipal service responsibilities)

> *The literature on size did not speak broadly to the frequency of regionalization of services, but it did state that capital-intensive services like water provision and*

rural road maintenance are sometimes regionalized to achieve economies of scale.

Evaluate and rank the effect of character of land use (bedroom community versus heavily commercial or industrial tax base)

The literature did not generally address these factors.

Evaluate and rank the effect of natural features (limitations on development owing to aquifers, steep slopes, other environmental sensitivities)

The literature did not generally address these factors.

Evaluate and rank the effect of age of community and infrastructure (older industrial cities versus newer settlements on the ex-urban fringe)

The literature did not generally address these factors.

Evaluate and rank the effect of demands on municipal services and infrastructure (seasonal peaks, bedroom community versus employment hub)

The literature did not generally address these factors.

Evaluate and rank the effect of stress on the property tax base (high proportion of tax exempt property, land use restrictions that inhibit ratable growth)

The literature did not generally address these factors.

The optimal size of municipal governmental jurisdiction that maximizes cost efficiency in municipal service provision

The overall result -- that municipalities between 25,000 and 250,000 in population are the most efficient -- breaks down when specific services are considered. The literature makes statements about smaller and larger, but is not consistent and specific about the ranges of population for specific tasks or services.

The identification of a range of optimal sizes depending upon municipal characteristics such as any enumerated above

The literature provides very little evidence about the impact of these municipal characteristics.

Whether optimal size varies based on what services are provided at the municipal level/the intergovernmental context

The literature finds that the specifics of the service are very important in the relationship between size and efficiency. Larger (up to a point, which is not specified in the literature) municipalities will deliver specialized and capital-

intensive services more efficiently. Smaller municipalities (as low as 5,000 population is mentioned) deliver labor-intensive services more efficiently.

Other variables which would be helpful for commission members to understand in attempting to identify criteria for consolidation

The most important point is the differentiation by the type of service. The literature even suggests that the details of tasks within a service type are critical. For example, small communities deliver police services more efficiently for routine patrol tasks, but large municipalities perform better in traffic light maintenance and special investigations. Over 80 percent of municipal services are of a routine and labor-intensive nature. Allocative efficiencies (management of resources) are more important than scale efficiencies in these routine service situations.

Purpose of the Report

To meet its overall goals as expressed in the legislation signed into law on March 15, 2007, the Local Unit Alignment, Reorganization, and Consolidation Commission (LUARCC) commissioned a literature review to address the question of whether there is an optimal size or range of sizes for a municipal government entity from the standpoint of efficiency and to minimize duplication of efforts. In the RFP it issued, LUARCC made it clear that size relates to the need for consolidation, which the enabling legislation for the establishment of LUARCC also states indirectly:

> Consolidating local units, structurally and administratively streamlining county and municipal government, and transferring services to the most appropriate level of government for delivery would help to alleviate the property tax crisis by reducing the administrative costs of local government and making the delivery of local services more efficient due to economies of scale.

The Commission stated the review of the literature on optimal size should take into consideration the diversity of local government and local government conditions in the State of New Jersey. The primary goal was the identification of an optimal size of a municipal government jurisdiction that maximizes cost efficiency in municipal service provision. The Commission asked whether the optimal size varies with the services provided and asked for information on any additional variables useful in the development of criteria for consolidation. LUARCC asked SPAA to seek evidence in the literature of any diseconomies associated with larger governments requiring proportionally more administration.

SPAA searched the literature with these guiding questions as a focus. The research team sought published research on the range of optimal sizes for a municipality in light of population density; physical area; demographics of the population served; land use characteristics; natural features; age of the community and infrastructure; unusual demands on municipal services and the infrastructure; and stress on the property tax base. The annotated bibliography that is included in this report is the result of that research. SPAA synthesized the information in the articles that are listed in the bibliography and arrived at the conclusions presented in this report.

Our review of the literature reveals that the size of local government and the closely related issue of fragmentation are not concerns specific only to New Jersey or to this period in time. New York and Indiana have recently formed commissions to study the same concerns. The 1970 New Jersey County and Municipal Government Commission Report on Joint Services – A Local Response to Area Wide Problems advanced these same issues.

It is not surprising to find no easy answers, no optimal size, and no ideal government structure in the literature, as there are a number of factors that influence the ability to measure the relationship between government size and expenditures reliably. Among these are the array of services under the responsibility of a local government, the quality of services provided, the willingness of citizens to fund local government services and the wealth of the citizenry. Based on the long-running North Carolina Benchmarking Project, Ammons and Rivenbark (2008) reflect on these sources of inconsistency in comparisons of municipal efficiency:

> Because of the inadequacies of efficiency measurement and lack of uniformity in cost accounting rules, most cities and counties wishing to compare their services with other jurisdictions are well advised to focus primarily on measures of effectiveness and quality, where cost accounting and the differentiation of multiple duties are not at issue, and only secondarily on measures of efficiency.

Although there are predominant themes relating size to the efficient delivery of municipal services, there are discrepancies. Our discussion starts with the predominant themes, but it then delves into specific service areas and the underlying factors involved in these specific service areas. It will also discuss types of efficiency and suggest that there are a number of different ways to obtain increases in efficiency.

REVIEW AND SYNTHESIS OF THE LITERATURE

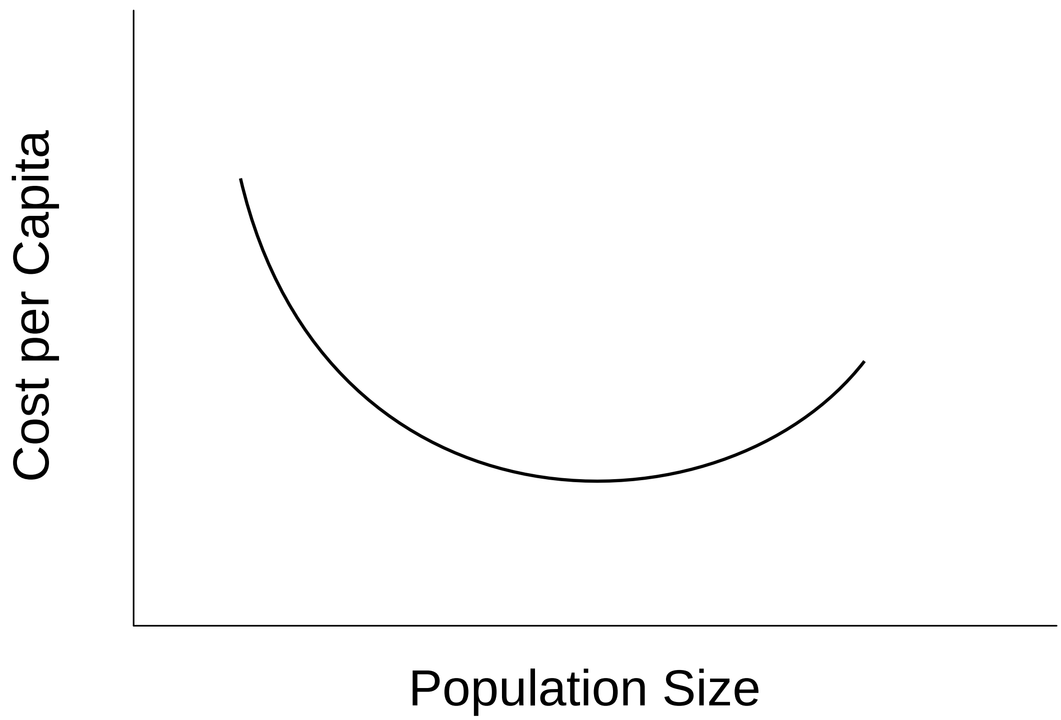
Overall Relationship between Municipal Size and Efficiency

The preponderance of the literature discusses the U-shaped curve between municipal size (as measured by population) and cost per capita to deliver municipal services (see Figure 1). The cost per capita measure is a general indicator of efficiency (rather, the inverse of efficiency, or inefficiency) commonly used in this kind of analysis. In other words, the U-shape suggests that in the smallest governments, one finds the greatest costs or inefficiencies, that there are some gains in efficiency (costs savings) as size increases, but these level off in the middle ranges of size, and for the largest municipalities some inefficiency returns.

However, even this discussion of the (inverted) U-shaped nature of the relationship between size and efficiency has variations. This clear statement is a starting point: "The consensus among researchers who have studied consolidation efforts is that nearly 80 percent of municipal services and activities do not possess economies of scale beyond a population of approximately 20,000 residents." (Katsuyama, 2003) Gabler uses a threshold of 25,000 (in 1960 population numbers) and is more emphatic about the diseconomies at the large end of the scale: "The results of this present study suggest that large cities tend to employ and spend more per capita than the smaller jurisdictions and that this tendency is attributable − in part − to the effects of city size." (Gabler, 1971) The 1987 report of the Advisory Commission on Intergovernmental Relations, "The Organization of Local Public Economies" provides further support for these numbers. The report reviewed the studies of several researchers and concluded that per capita costs generally fall with increasing size for municipalities with populations up to 25,000, remain fairly constant for those up to 250,000, but then rise significantly.

The U-shaped curve seems relatively consistent and generalizable across social and cultural contexts. A study of water supply in rural India (World Bank, 2008a) provides more evidence of the U-shape, but in this case, it is applied to households and in a very different context. "The size classes 500 to 1,000 households and 1,000 to 1,500 households have relatively lower cost, compared to smaller or larger piped water supply schemes." Post-war amalgamation in Japan also showed the U-shaped function, but with somewhat different levels of population, indicating 115,109 persons was the threshold at which efficiency gains would reverse (Mabuchi, 2001).

FIGURE 1: Hypothesized shape of the relationship between size of jurisdiction and cost of public services



Several studies show little or no relationship between size and efficiency. In a study of counties providing local services in Iowa (Koven and Hadwiger, 1992), the authors see no evidence for the 'bigger is better' mantra.

> The big county is not superior in most respects. Per capita expenditures of the large county exceed those of four of the five smaller counties. Per capita taxes, similarly, are higher in the big county functions but were generally no higher than the per capita expenditures in smaller counties, except for hospitals, highways, and capital outlays. The evidence from the double-sized county indicates that economies of scale leading to lower taxes and spending have not transpired. Factors such as quality of services, organizational slack, and willingness of residents to pay for services must be considered in order to draw more definitive inferences concerning the advantages of plans for structural reorganization. The Iowa data, however, do not support the view that bigger is necessarily more efficient.

This does not necessarily refute the U-shaped curve finding and, in fact, may support it, but the message of the author clearly focused on opposing consolidation. Another quote makes that completely clear: "Consolidation may not produce savings or be politically feasible." Note that capital outlays are an exception, which is a point that is evident in other references.

Australia enacted many consolidations based on the widespread acceptance among policy makers that larger municipalities would exhibit greater economic efficiencies. Byrnes and Dollery (2002) reviewed the literature to determine if an empirical basis existed for this view. Their conclusion was, "The lack of rigorous evidence of significant economies of scale in municipal service provision casts considerable doubt on using this as the basis for amalgamations."

An early study from Ontario, Canada finds little support for the relationship between size and efficiency, including even among the smallest municipalities (Bodkin and Conklin, 1971). The study was investigating the proposition of consolidation promoting efficiency and stated "…our calculations suggest that quite small municipalities, even those with populations in the range of 5,000 to 10,000 persons, can provide fire and police protection, sanitation and waste removal, conservation of health, recreation, and general government services as cheaply, or even more cheaply, than can the larger municipalities."

"Sources of Public Service Improvement" (Boyne, 2003) presents a review of empirical studies of public service performance. It concludes: "Little support is found as to the proposed relationship between organizational size and service performance." Generally, many factors assumed important had little or no impact on performance. "There is no indication that extra resources (financial & real resources) lead to poorer services, and there is only moderate support for the proposition that it will lead to better services." On one factor, the author gives a positive thumbs-up: managerial variables have a significant impact on performance. We discuss management further under types of efficiency.

Although the focus of Mera's article, "On the Urban Agglomeration and Economic Efficiency" (Mera, 1973), is economic development, there is a clear statement from the evidence that relates to government expenditures per capita:

> the evidence supported the proposition that wealth or resources (measured in terms of median family income and state aid) is far more important than population size or density in explaining variations in total per capita expenditures among local units...This conclusion is not unique; it confirms earlier studies which tend to show that the expenditure per capita is not very much related to the population size when the expenditure is one way or another adjusted for quality differences.

The study, "Fragmentation and Sprawl: Evidence from Interregional Analysis" (Carruthers and Ulfarrson, 2002), that focused on the relationship between fragmentation and sprawl, also notes the effect on public expenditures. "Fragmentation is associated with lower densities and higher property values but has no direct effect on public service expenditures."

Impact on Specific Service Types

The literature shows not all service types react to municipal size in the same manner. In fact, some effects are opposite to the general finding of the U-shaped curve, depending on the service rendered to the public. Bish (2001) reviews over fifty years of literature on amalgamation in coming to the conclusion that policymakers need to change their thinking about governance, abandoning the discredited belief in large hierarchical organizations and moving to a research based understanding of the conditions under which local governments can function successfully.

One general distinction in the overall relationship between size and efficiency stands out: capital-intensive versus labor-intensive services. Generally, capital-intensive services, such as water delivery, sewer services, and road maintenance become more efficient or less costly with increasing size. This is fairly intuitive. Not as intuitive is that labor-intensive services not only fail to benefit from increasing size of a municipality, but also may actually show diseconomies of scale. Jake Haulk, President of the Allegheny Institute for Public Policy in Pittsburgh, says research shows that towns are most efficient in delivering services such as police, fire protection and roads at a population of about 15,000 (Cauchon, 2006). The small towns often fill needs specific to the tiny areas they serve. Police services are the most studied example of such labor-intensive services.

An enduring article from half a century ago summarizes these effects succinctly: "…water and sewage services, which often account for about 8-10 per cent of total expenditures, tend to be rendered in a vertically integrated plant. Growth and consolidation will lead to a decline in per capita expenditures until a very large scale is reached, so large that few city and metropolitan areas have achieved it." On the other hand, "Public education, fire protection, police protection, refuse collection, etc., accounting for around 80-85 per cent of all expenditures, will be furnished in horizontally integrated service plants. Growth and consolidation appear to have little, if any, significant effect on per capita expenditures for these services." (Hirsch, 1959) The author also includes general administrative services, but there is a more complex relationship for this service type. "The central administration of municipal or special district governments, accounting for 3 - 6 per cent of total local government expenditures in metropolitan areas, is performed mainly in a circularly integrated plant. In the early growth stage, per capita expenditures for these services will tend to decline. Beyond a point found in medium-sized communities, growth or consolidation will tend to produce per capita expenditure increases." Administrative services appear similar to other labor-intensive services, but show efficiency gains at the low end of municipal size, reversing that trend at the higher end, much like other labor-intensive services.

A different conceptualization produces the same conclusion. Services that require capital investments are easy to measure, are needed only rarely, possess economies of scale in relation to the population served, and may be produced most efficiently for large populations. Conversely, services that are labor-intensive are difficult to measure, are performed frequently and regularly, and are likely to possess diseconomies of scale (Bish, 2001). The author also observes most researchers conclude that approximately 80 percent of local government activities do not show economies of scale beyond populations of 10,000 to 20,000. The remaining 20 percent are for specialized services needed infrequently by small municipalities.

Other studies mirror the results for water services (Fox and Gurley, 2006; Tynan and Kingdom, 2005; World Bank, 2008a; Bodkin and Conklin, 1971). It is not surprising that water services are often delivered as a contractual service with either a private or public provider or are provided through a regional authority. These mechanisms are better at amassing the required capital for infrastructure development and enhancement. Tynan and Kingdom note further, however, that a desire for increased customer responsiveness has been pushing the transfer of services to the municipality, which will result in cost increases.

Public works services can incur high capital costs for equipment, but unlike water and sewer systems, these are not at the level of infrastructure development. Some authors have investigated road maintenance in rural New England and found it behaves like water and sewer services rather than like police services (Deller, et al, 1992, Deller and Halstead, 1994). The authors conclude: "small town governments may best match local demand with services, but at high cost". The first, but not the only factor, is the scale efficiency obtained with increasing size. "The data strongly support the notion of economies of size in the production of rural road services." One option would be to consolidate this service, but efficiencies are also possible through joint or cooperative purchasing.

The second factor the authors point to is not scale efficiency, but allocative efficiency (management use of resources). Small towns do not use resources efficiently. Deller and Halstead seem to link the bulk of the 40 percent higher-than-necessary costs with the inefficient use of inputs. In sum, the authors boldly state: "… the current institutional arrangement of placing rural road maintenance responsibilities in the hands of town officials is highly inefficient in terms of both size economies and managerial efficiency" and then back off with: "These results, however, should not necessarily be used to promote reforming smaller units of government into larger, more economically efficient units."

When we turn our attention to police services, the initial research is strongly in favor of small departments. These results are in part because of perceptions of safety and responsiveness, but they are also directly related to efficiency and cost containment. There is also a reaction in the literature to what one author terms "the anti-consolidationists."

> Their (Elinor Ostrom et al) work consistently demonstrates that smaller units tend to be more responsive providers of police services. …No study

> has found a large police department (over 350 officers) able to perform more effectively in delivering direct services to citizens in similar neighborhoods than smaller departments. Frequently small departments deliver better service at lower cost. (Advisory Commission on Intergovernmental Relations, 1987)

This report showed similar results for small town efficiencies in other service areas, such as education.

Allocative efficiency (management of resources) is more effective in small departments, but it is slightly offset by the U-shaped curve of scale efficiency (size economies) in the middle range of department size (Drake and Simper, 2000). Drake and Simper assert the reasons for the better management efficiencies are that "effective resource usage and cost control are easier to accomplish in smaller police forces than in larger ones." Scale efficiency leads to the results that predominate in the literature. First, there is a diseconomy of scale in the largest departments − efficiency declines with increasing size. But at moderate levels of size, larger size units show greater efficiency. These gains in efficiency within the moderate size departments are modest.

Ostrom and Whitaker's work in the '70's refutes the theory that size will beget efficiency in policing. Although there is some evidence that there are gains at the lower end of the size spectrum, because of less responsive performance at medium sizes and above, the evidence supports the provision of services by smaller departments. The initial study (Ostrom and Whitaker, 1973) compared three independent communities adjacent to Indianapolis with three matched neighborhoods within the city. The citizens in the independent communities were victimized less, received assistance more, the assistance came more rapidly, and the residents rated the police-citizen relationships as good in a higher percentage (94% versus 82% of residents). The police departments in the independent communities achieved a higher level of output. The authors' conclusion was, "Our findings strongly suggest that in the area studied, small police forces under local community control are more effective than a large, city-wide-controlled police department in meeting citizen demands for police protection."

Three years later Ostrom looked at a series of empirical studies (Ostrom, 1976). "In general, examining the full set of respondents, we found consistent but weak relationships between size of jurisdiction and general evaluations of police services. All significant relationships run counter to those predicted in the simplified consolidation model. Feelings of safety decrease with size; fear of break-in and attack increase with size; and the rating of police honesty decreases with size. In regard to the cost of police services, we found a positive relationship between city size and per capita costs." The author concludes that small departments are better performing than large: "…very small- to medium-sized police departments consistently perform more effectively and frequently at less cost than do large police departments."

Pachon and Lovrich disagree and re-analyzed the data on public perceptions of police in 15 cities (Pachon and Lovrich, 1977). They assert that the effects Ostrom saw were due to the socioeconomic characteristics of the respondents:

> ... [T]here appears to be very little evidence of a negative relationship between jurisdictional size and citizen satisfaction when controlling for socioeconomic characteristics. Quite to the contrary, the overwhelming trend is in the opposite direction: in five of the six partial correlations calculated there is weakly positive relationship between city size and citizen satisfaction! The strength of this positive relationship is particularly evident in the small suburbs category.

The authors also refute Ostrom's statement that large police departments are not more efficient or economical. However, they produce no additional data or analysis, simply stating that the evidence is still inconclusive.

A study of English libraries is one of the few instances in which the population served was considered in assessing the relationship between municipal size and efficiency (Stevens, 2005). Although no direct effect of population density on expenditures was in evidence, an indirect one exists. Costs are lower either where a large young population (under 16) or a large senior population (over 65) exists. Costs are higher in areas serving a large economically deprived population. Although not as detailed in evaluating other factors, another study of libraries in the bottom half of the globe (New South Wales, Australia) found that efficiency can be achieved for population levels between twenty and thirty thousand persons (Worthington, 1999)

Considering the different relationships between size and efficiency for different service types, it is difficult to conclude that one size government is optimal in all circumstances. Bish (2001) takes this statement further by observing that even in a service category, there can be both functions that small governments deliver more efficiently and functions that large governments deliver more efficiently. For example, police services include both routine patrol (favoring small) and specialized homicide investigations (favoring large). The conclusion is that no single size of organization is suitable for all services, even within a service type.

Some Additional Detailed Findings

The details in the work of Gabler; Revelli and Tovmo; Katsuyama; and Boyne provide evidence of how difficult it can be to identify effects that are consistent. We present them here, in part for completeness, but also to demonstrate the inconsistencies in the results in the literature.

Gabler studied efficiency in three states: Texas, Ohio, and New Jersey (Gabler, 1969). Many results are not consistent in all three states. When he looked at the medium size municipalities (25,000 to 250,000 population), the only systematic relationship between size and per capita expenditures was for fire protection in Texas, in which size led to higher per capita cost. Size and public employment rose together for parks and recreation in Texas and Ohio, and for administration, police, and fire in Texas. No other relationships are significant in the three states and service areas studied. Given these mixed results for medium-sized populations, Gabler concludes that no major economies or diseconomies of scale exist.

Among the larger cities (over 250,00 population), Ohio shows greater police expenditures with increasing size, but this is not related to greater manpower needs. Texas shows no relationship between size and costs or employment other than a slight tendency for expenditures for administration to increase with size. In New Jersey, diseconomies of scale exist in total expenditures per capita, total employment, administrative employment, expenditures for sanitation, employment for sanitation, expenditures for police, and expenditures for fire. No other relationships are evident other than an economy of scale for highway expenditures and employment. (Table 1 compares expenditure data in New Jersey's two largest cities with 34 smaller cities.)

TABLE 1 – PER CAPITA EXPENDITURES PER 100 POPULATION FOR SELECTED FUNCTIONS BY CITY SIZE IN NEW JERSEY

City Size 1960 Population	Total	Highways	Police	Fire	Sanitation and Sewerage	Parks and Rec.	General Control
34 Cities (25,000 – 250,000)	139.93	6.11	15.87	13.38	11.43	5.46	3.21
Jersey City (276,101)	192.39	4.29	24.47	18.34	9.68	6.21	4.15
Newark (405,220)	211.50	4.06	30.02	20.52	14.02	3.90	2.96

Reformatted from "Economies and Diseconomies of Scale in Urban Public Service" (Gabler, 1969). Expenditure data are from 1962 and are divided by the 1960 census figures of population.

Gabler's study also looked at the effect of population density on expenditures per capita and employment per capita. The findings are less significant and uniform than those for population size. There are not clear-cut findings for service areas that apply across all three states, although his general finding that larger cities experience diseconomies of scale is supported more often than it is not. His later study (Gabler, 1971) confirms these mixed results, but also shows that the largest cities do experience diseconomies of scale.

A study from Norway that looked at both population size and population density adds to the lack of consistency associating these factors with efficiency (Revelli and Tovmo, 2007). These authors found a negative relationship between size and efficiency (larger governments were less efficient) and a positive relationship between the sparseness of the population and efficiency. Rural areas attained higher levels of efficiency.

The general finding of Katsuyama's review of studies of consolidation was that there was a population threshold of 20,000, beyond which economies of scale do not persist (Katsuyama, 2003). However, for the 20 percent of municipal services that are highly specialized, used infrequently, or require large capital investments, the results are different. Spreading large capital costs over a larger population will reduce the cost per capita. Katsuyama agrees with others that, on the other hand, labor-intensive services show diseconomies of scale with increasing size for populations in excess of the population threshold at 20,000. Under that threshold, some studies indicate there may be economies of scale from consolidation, either with a larger municipality or between two smaller municipalities.

New Public Management (NPM) theorists believe that disaggregating large municipalities into smaller units enhances performance. The NPM perspective is not focused entirely on cost efficiency. The belief is that large organizations are bureaucratic, inefficient and lack the managerial flexibility to meet their goals. Boyne analyzed data on six service areas to evaluate this anti-consolidation position (Boyne, 1996). The study uses five dimensions of performance (service coverage, quality, speed, efficiency, and administrative effectiveness) with measures of scale based on workload and output, not population. Since there is no direct relationship to municipal size in the tested hypothesis, the application of the findings is difficult. Boyne states that only in half of the cases, the smallest units were the best performers and, when performance declined with scale, the very largest units showed a reversal of the trend. The author states further that the negative relationship between scale and performance reverses at a very large scale. This result is present in social services, waste recycling, planning, and housing.

COMMENTS ON THE LITERATURE

The main dependent variable in this analysis, expenditure per capita, is a difficult one to measure. Ammons, who serves on the National Performance Management Advisory Board, a joint effort of eleven leading public interest associations to develop a comprehensive, conceptual framework for public sector performance management, expresses serious concerns about the complexity of measuring efficiency across jurisdictions. He is also one of the highly regarded faculty at University of North Carolina's Institute of Government, where they have conducted the practice of comparative performance measurement and benchmarking for at least a decade. He and his colleagues have grappled with cross-jurisdictional comparisons in North Carolina.

> Expenditure data is inconsistent. In the face of these complexities, too many local governments resort to reporting "FTEs per 1,000 population" or "cost per capita" for services overall or for the services of a particular department. These are extremely crude measures of efficiency, if they can be called efficiency measures at all. (Ammons and Rivenbark, 2008)

Burkholder, who, as the principal of Summit Collaboratives, LLC, has been gathering and reporting data in a small consortium of municipalities in New Jersey, provided testimony before LUARCC about many causes of comparative inconsistency, such as:

- Additional services that were provided under identical department names
- Similar services that are categorized under different department names in different towns
- Loaning of personnel during peak needs in other departments, with no concomitant budgetary accounting
- Personnel that routinely provide services in multiple departments without appropriate division of labor expenses

Factors such as these affect both the overall expenditures of a municipality and its division into department budget lines. This is even more problematic in a line item than in a program-based budget. There is no evidence in the academic literature of a detailed analysis of the array or depth of services included in accounting or departmental categories. And there is no evidence that the studies SPAA has found controlled for these difficult inconsistencies. That being said, this affects the precision and use of the results, rather than the overall findings.

If the relationship between size and efficiency is confounded by varying levels of service provided by different governments, one might expect to see differences in public satisfaction with the services delivered. Academics do study citizen satisfaction, but they often find there is little or no evidence that service productivity actually enhances such satisfaction (Moore et al, 2005). Anyone who has lived or worked in a small town knows the expectations of service are less. Although this does not mean that a citizen is willing to wait 23 minutes rather than six for an EMS response, it does mean he/she may be accustomed to the tax assessor not being available or the construction code official having part-time hours. The literature indeed suggests that citizen expectations do play a role in citizen satisfaction ratings (Van Ryzin 2004, 2006). But it is not clear how different expectations, if they exist, should be dealt with systematically across the diversity of a large state such as New Jersey.

Although a few of the references SPAA found in its search did address demographic factors in looking at the relationship between size and efficiency, most studies do not take demographic or other external factors into account. The distinctions studied are for internal variables, such as service type or forms of efficiency. This is an important limitation in the literature.

Ideology plays a role in the literature. The New Public Managers, who favor disaggregation of large municipalities, face off against the Consolidationists. Pachon and Ostrom argue about the relationship between size and citizen satisfaction with policing. We have tried our best to present these opposing findings and suggest where the interpretations may outstrip the data.

CONCLUSIONS

Although the literature does not reveal strong and consistent relationships between size and efficiency in the delivery of local government services, some relationships are evident. The first relationship describes the overall effect of size of government on efficiency. The second and third statements show that the general relationship does not hold when specific services are considered. The fourth point, about the difficulties of measuring efficiency, is very important in the determination of what promotes municipal efficiency:

- The Inverted U-shaped Curve

  There is an inverted U-shaped relationship between size and efficiency on a general level. Efficiency increases with population size up to about 25,000 people, at which point it is stable until size is about 250,000 people, and efficiency declines with increasing population size after that. The inverted U-shaped curve that describes the relationship between municipal size and efficiency offers two opportunities for improvement: the very smallest and the very largest governments. The literature defines the smallest as populations less than 20,000 to 25,000. The largest are municipalities with populations in excess of 250,000, which is a limited pool in New Jersey. However, in the one reference from the literature search that specifically studied New Jersey (Gabler, 1969), the diseconomy at the largest end of the spectrum was more uniformly pronounced than in two other states to which it was compared. The literature suggests New Jersey should examine its largest governments as well as its smallest governments for ways to increase efficiencies.

- Service Specific Relationships

  The most important finding other than the inverted U-shaped curve was the difference in the relationship between size and efficiency in capital based services as opposed to labor-intensive services. Efficiency gains are related to size for capital or infrastructure intensive services such as sewer and water. The literature supports the finding that this same concept is operative for seldom used and specialized services, such as a high technology crime lab. This suggests that contracting, sharing, or receiving specialized services from a larger entity can make selected services more efficient.

- Labor-Intensive Services

  Labor-intensive services are more efficient in smaller governments. The literature only offers burdens of management control and excess administration in larger governments as an explanation for such inefficiencies. Reduced levels of services and expectations in smaller towns may also be operating to reduce costs. This finding of increased efficiency in smaller units is an important conclusion, because the literature attributes over 80 percent of governmental cost to labor-intensive services including police, fire, and education.

- Complexity of Measuring Efficiency

  An additional finding from the literature is the difficulty in determining one measure of efficiency that works well at the level of a municipality or even for a service area. The most common basis for a measurement of efficiency is expenditure data, which is the numerator in the cost per capita indicator used throughout the literature. Varying definitions of expenditure measures across jurisdictions are the culprit in the comparability of this indicator. LUARCC has begun to evaluate the possibility of using municipal expenditure data in New Jersey to examine efficiency and the factors that promote it. While a difficult task, this makes a great deal of sense, because of the ability to attempt to control some of the confounding influences.

Finally, we must recognize that there are many inconsistencies in the literature. Even the most consistent findings of the inverted U-shaped curve and the relationship for capital-intensive versus labor-intensive services have variations supported by some authors. For example, we could not reconcile the debate over police responsiveness and inefficiency in small versus large units. Different authors observed greater managerial efficiencies in small units, but others saw relative efficiencies in large units. The literature does not provide a high level of confidence for further action on a systematic and broad basis.

APPENDIX A -- ANNOTATED BIBLIOGRAPHY
Literature Review and Analysis Related to Optimal Municipal Size and Efficiency

Advisory Commission on Intergovernmental Relations (1987). The Organization of Local Public Economies**:** 1 - 56.

> This commission report reviews the optimal structure of local government. The report declares that a multiplicity of general and special purpose governments contributes to democratic values and a coherent local public economy. The report distinguishes between the provision (that is, the determination of what) and the production (that is, the determination of how) of public goods and services.

Ammons, D. N., and William C. Rivenbark (2008). "Factors Influencing the Use of Performance Data to Improve Municipal Services: Evidence from the North Carolina Benchmarking Project." Public Administration Review **68**(2): 304-318.

> Many local governments measure and report their performance, but the record of these governments in actually using performance measures to improve services is more modest. The authors of this study examine patterns of performance measurement use among a set of North Carolina cities and conclude that the types of measures on which officials rely, the willingness of officials to embrace comparison, and the degree to which measures are incorporated into key management systems distinguish cities that are more likely to use performance measures for service improvement from those less likely to do so..

Bish, R. (2001). Local Government Amalgamations: Discredited Nineteen-Century Ideas Alive in the Twenty-First. Communiqué, C. D. Howe Institute.

> The twenty-first century will be one of rapid change and great need for institutional adaptability. Yet, in the critical area of the relationships among citizens, the civil community, and local governance, some provincial governments are imposing an intellectual fashion of the nineteenth century in the form of an almost religious faith in monolithic organizations and central control. This *Commentary* undertakes a comprehensive review of 50 years of evidence on the relationship between the structure and performance of local governments in metropolitan areas.

Bodkin, R. G., and David W. Conklin (1971). "Scale and Other Determinants of Municipal Government Expenditures in Ontario: A Quantitative Analysis." International Economic Review **71**(3): 465-481.

> This article summarizes a study of the determinants of municipal government expenditures, which was undertaken for the Government of Ontario. It examines the abilities of large and small municipalities to deliver specific types of services efficiently.

Borukhov, E. (1975). "On the Urban Agglomeration and Economic Efficiency: Comment." Economic Development and Cultural Change 199 - 205.

In a recent article Koichi Mera addressed himself to the question of the economic efficiency of urban agglomeration. Specifically, he claims to have demonstrated that "in terms of economic efficiency, even the largest metropolitan area in the world is likely to less than the 'optimal' size." The purpose of this article is to dispute this claim. The original article and this comment are focused on the effect of size on overall economic productivity, not local government expenditure, but Borukhov does reference studies on the expenditure of local government.

Boyne, G. A. (1992). "Local Government Structure And Performance: Lessons From America?" Public Administration **70**(Autumn): 333-357.

The debate in the UK on the reform of local government structure is poorly informed by empirical evidence. This article bridges part of the empirical gap by drawing upon analyses of structural effects in the USA. Two main dimensions of structure are outlined: fragmentation and concentration, both of which can vary vertically and horizontally. Fourteen structural hypotheses are identified and categorized as technical, competitive and political effects.

Boyne, G. A. (1996). "Scale, Performance and the New Public Management: An Empirical Analysis of Local Authority Services." Journal of Management Studies **33**(6): 809-826.

New public management (NPM) arguments on strategy and structure suggest that performance is enhanced if large organizations are disaggregated into smaller units. The NPM perspective reflects the views of public choice theorists who claim that big organizations are unresponsive to public needs, inefficient and fail to achieve their formal goals. These arguments have underpinned many recent changes in the structure of public services at both central and local levels. This paper uses data on six local government services to test the NPM hypothesis that there is a negative relationship between scale and performance. Five dimensions of performance are analyzed: service coverage, quality, speed of provision, efficiency, and administrative effectiveness. Scale is measured through indicators of service output, caseload and needs. The impact of scale is tested in multivariate statistical models which control for other potential influences on variations in performance across local authorities.

Boyne, G. A. (2003). "Sources of Public Service Improvement: A Critical Review and Research Agenda." Journal of Public Administration Research and Theory **13**: 357-394.

Evidence from sixty-five empirical studies of the determinants of public service performance is critically reviewed. The statistical results are grouped on the basis of five theoretical perspectives: resources, regulation, markets, organization, and management. The analysis suggests that the most likely sources of service improvement are extra resources and better management. A research agenda for further work is identified, and recommendations are made to enhance the theoretical and methodological qualities of studies of public service improvement

Byrnes, J., and Brian Dollery (2002). "Do Economies of Scale Exist in Australian Local Government? A Review of the Research Evidence." Urban Policy and Research **20**(4): 391-414.

The 1990s witnessed a major era of structural reform in Australian local government. Amalgamation programmes in all six states resulted in a substantial decrease in the number of local authorities in Australia. The chief rationale underlying local government mergers lay apparently in the belief that larger municipalities would exhibit greater economic efficiencies. Despite its widespread acceptance amongst policy elites, this argument did not derive from a solid empirical base. This article seeks to evaluate available research evidence on the controversial question of economies of scale in Australian local government.

Capello, R., and Roberto Camagni (2000). "Beyond Optimal City Size: An Evaluation of Alternative Urban Growth Patterns " Urban Studies **37**(9): 1479-1496.

The aim of the paper is to present a critical view of theoretical works on city size. Note that the dependent variable is not the efficiency of government, but efficiency of the city, as a whole. It begins with the consideration that, during the 1960s and 1970s, the question of optimal city size tended to be expressed in a misleading way. The real issue is not 'optimal city size' but 'efficient size', which depends on the functional characteristics of the city and on the spatial organization within the urban system. Economies of scale exist up to a certain city size. However, urban development generates conditions leading to structural readjustments which may create new economic advantages. These structural adjustments may either be sectoral transformations towards higher-order functions, or increases in external linkages with other cities. The paper provides empirical evidence of these processes, and contains an econometric evaluation of urban location benefits and cost functions with respect to different levels of network integration, size and urban function. The model is applied to 58 Italian cities.

Carey, M., Ashok Srinivasan, and Robert Strauss (1996). "Optimal Consolidation of Municipalities: An Analysis of Alternative Designs." Socio-Economic Science **30**(2): 103-119.

The authors present a model for estimating the cost of providing local government services, and then introduce the notion of the "optimal" size of a municipality. In this paper, they present an analytic framework for the geographic aggregation of municipalities into larger and more populous municipal districts in order to reduce the costs of providing public services. The model allows the authors to determine the optimal number of districts for a fixed population size in a given geographic area, and to arrive at the extent of cost savings possible in the absence of additional considerations.

Carruthers, J. I., and Gudmundur F. Ulfarsson (2002). "Fragmentation and Sprawl: Evidence from Interregional Analysis." Growth and Change **33**(summer): 312-340.

Recent years have witnessed widespread expansion of state and regional planning programs in the United States. A major purpose of these efforts is to reduce urban sprawl, -- low density, discontinuous, suburban-style development, often characterized as the result of rapid, unplanned, and/or uncoordinated growth -- by promoting jurisdictional cooperation and regulatory consistency across metropolitan areas. This paper evaluates the efficacy of this approach by examining the relationship between governmental fragmentation and several measureable outcomes of urban development: density, urbanized land area, property value, and public expenditures on infrastructure. The four dimensions are modeled in a simultaneous equations framework, providing substantive evidence on how fragmentation and other exogenous factors affect metropolitan growth patterns.

Cauchon, D. (2006). Big Government? N.J. Has Scads of Little Ones; State Looks at Consolidation to Cut Taxes. USA Today**:** 1-2.

This newspaper article coincided with the beginning of the New Jersey special legislative session on property taxes. The article presented the perspectives of the governor, legislators, local officials and the public, as reflected in a Gannett poll. The USA Today article analyzed New Jersey local government to be only slightly more costly than that of the average state.

Chicoine, D. L., S.C. Deller, and N. Walzer (1989). "The Size Efficiency of Rural Governments: The Case of Low-Volume Rural Roads." Publius: The Journal of Federalism **Winter**: 127-138.

The deterioration of the supply of public infrastructure throughout the United States has been found to be accelerating. The reason most often cited for the increasing rates of deterioration is the lack of available funding, or fiscal stress, present in many local governments. A popular short-term solution to fiscal stress is to defer infrastructure repairs and/or replacement programs. This is particularly true in rural areas where a declining agricultural base and redirected federal policy have placed significant downward pressure on revenues. The search for a long-term solution has renewed the debate about the optimal size of local governments. The research reported here examines the issue of size efficiency in the production of low-volume rural roads in the Midwest. At issue is the ability of Midwest townships to realize size economies. Overall, size inefficiencies were identified, which suggests that cost savings may be realized from the reorganization of the production of low-volume road services.

Christoffersen, H., Martin Paldam, and Allan Wurtz (2007). "Public versus Private Production and Economies of Scale." Public Choice **130**(3-4): 311-328.

The cost of producing the same good often differs substantially for public and private producers. The study investigates the effect of organization in a case where the production technology is simple: The cleaning of Danish schools. Three forms of organization are used: decentralized municipal, central municipal or private.

County and Municipal Government Study Commission (1970). Joint Services - A Local Response to Area Wide Problems.

This 1970 report was referenced in the LUARCC project reports to provide evidence of the on-going nature of the interest in shared services and the effficiency of local government

Deller, S. C., and C.H. Nelson (1991). "Measuring the Economic Efficiency of Producing Rural Road Services." American Journal of Agricultural Economics **73**(1): 194-201.

The research reported here examines the ability of a sample of Midwest township officials to produce low-volume rural road services in an economically efficient manner. Farrell-type measures of input use and scale efficiency are reported. Results suggest that over 50% of costs may be unnecessarily incurred because of input use inefficiency. Correlation between output measures and the efficiency measures suggests that larger jurisdictions are more efficient than smaller jurisdictions. In addition, 84.5% of the townships exhibit technology characterized by increasing returns to scale. These results suggest that jurisdictional consolidation of production-related responsibilities may yield substantial cost savings.

Deller, S. C., Carl H. Nelson, and Norman Walzer (1992). "Measuring Managerial Efficiency in Rural Government." Public Productivity & Management Review **15**(3 (Spring)): 355-370.

Structural limitation and narrow managerial capacity have consistently hampered both an effective and efficient decision-making process in small rural governments. Due to small size and relative isolation, rural governments are inherently limited in developing either effective policy or efficient delivery systems. These structural barriers have prevented many rural public officials from developing the capacity, resources, and expertise needed for managing increasingly complex problems. This article provides a brief review of the performance measurement literature and suggests an alternative approach to assessing the efficiency of producing local public services. The proposed method seeks to incorporate microeconomic theory into the measurement process. The case of producing low-volume rural road services in the Midwest is examined to illustrate the method. The data used to study managerial efficiency in the production of rural road services were gathered from a mail survey of Illinois, Minnesota and Wisconsin township road officials and the 1982 Census of government. The sample contains 435 independent observations of Midwestern townships.

Deller, S. C., and John M. Halstead (1994). "Efficiency in the Production of Rural Road Services: The Case of New England Towns." <u>Local Economics</u> **70**(20): 247-59

An analysis of size and managerial efficiency of northern New England towns in the production of rural road services is reported. A stochastic cost frontier was used as the normative efficiency reference set. Empirical results provide evidence of economies of size in the production of road service in New England and evidence that size inefficiencies are present. Results also suggest that managerial inefficiencies, or input use inefficiencies, are present and costs may be 40 percent higher than necessary. At issue is the effectiveness of current institutional arrangements: small town governments may best match local demand with services, but at high cost.

Department of Infrastructure, Transportation,, Regional Development and Local Government, (2004). 2003-2004 Report on the Operation of the Local Government (Financial Assistance) Act 1995

This report of the Australian government examines various structural reforms. Typically, economic approaches to local government performance improvements take one of two forms. In the 'conventional' view, large, hierarchical, multipurpose organizations are seen as the best way to organize local public services. This approach argues that in a 'consolidated' structure, all services are provided by a single unit that covers a wide geographical area. Economic arguments usually advanced in support of this view include economies of scale, economies of scope, administration and compliance costs (Dollery & Crase 2004). The 'public choice' perspective that has gained prominence in the last 40 years provides a sharply contrasting view. Proponents argue that efficiency and responsiveness are enhanced by local government structures that are based on markets and competition rather than on structural and administrative consolidation.

Dollery, B., Chong Mun Ho, and James Alin (2008). "No Lessons Learned: A Critique of the Queensland Local Government Reform Commission Final Report." Agenda. Retrieved January 28, 2009, from http://epress.anu.edu.au/agenda/015/01/mobile_devices/ch05.html#d0e2389.

On 17 April 2007 the Queensland government established a Reform Commission to consider the compulsory amalgamation of local councils. On 27 July 2007 the Commission recommended a program of compulsory amalgamation that would reduce the number of local councils from 157 to 73. These recommendations were passed into law amidst great acrimony in the early hours of 10 August. This paper provides a critical evaluation of the arguments for amalgamation presented by the Commission in the light of the scholarly literature on local government mergers.

Drake, L., and R. Simper (2000). "Productivity Estimation and the Size-Efficiency Relationship in English and Welsh Police Forces: An Application of DEA and Multiple Discriminant Analysis." International Review of Law and Economics **20**(1): 53-73.

This article utilizes data envelopment analysis (DEA) to estimate the productivity of the English and Welsh police forces and to determine whether there are categorical scale effects in policing using multiple discriminant analysis (MDA). The article demonstrates that by using DEA efficiency results it is possible to make inferences about the optimal size and structure of the English and Welsh police forces.

Drake, L., and R. Simper (2002). "X-Efficiency and Scale Economies in Policing: A Comparative Study Using the Distribution Free Approach and DEA." Applied Economics **34**(15): 1859-1870.

This study uses both parametric and nonparametric techniques to analyze scale economies and relative efficiency levels in policing in England and Wales. Both techniques suggest the presence of significant scale effects in policing and considerable divergence in relative efficiency levels across police forces.

Duncombe, W., and John Yinger (1993). "An Analysis of Returns to Scale in Public Production, with An Application to Fire Protection." Journal of Public Economics **52**(1): 49-72

This paper analyzes returns to scale in public production. Existing studies fail to differentiate among three dimensions of scale: service quality, the level of governmental activity, and the number of people served. A fourth dimension, economies of scope, is need for agencies that provide multiple services. This paper provides a formal definition of returns to scale for each dimension. This framework is applied to fire protection, using a translog cost function with two services, fire prevention and fire suppression. The results indicate economies of scope, increasing returns to quality scale, and constant returns to population scale.

Duncombe, W., Jerry Miner, and John Ruggiero (1995). "Potential Cost Savings from School District Consolidation: A Case Study of New York." Economics of Education Review. **14**(3): 265.

This article presents the results of a detailed study of potential cost savings from consolidation of New York school districts. It extends past research on consolidation by developing a theoretical framework which distinguishes several dimensions of economies of scale and defines an empirical cost function for schooling. While findings apply directly to New York, the method developed here has general relevance to state education policy by helping to target candidate school districts for consolidation, and, where consolidation is not feasible, adjusting state aid formulae to reflect more accurately the cost impacts of scale.

Fox, W., and Tami Gurley (2006). Will Consolidation Improve Sub-National Governments?, World Bank.

Local government size varies dramatically around the world. In Sudan, Côte d'Ivoire and the United Kingdom municipalities average more than 125,000 people. Those in many European countries have less than 10,000 people. Countries often consider consolidation of local governments as a means to lower service delivery costs, improve service quality, enhance accountability, improve equity or expand participation in government. The paper reviews a number of theoretical arguments and empirical findings concerning the size of sub-national governments. Countries should not presume that amalgamation will solve the problems because benefits and costs are situation specific. Success depends on many factors including getting incentives right for the various players and managing the transition properly. The effects on costs must be examined in terms of all changes occurring with consolidation, including geographic size.

Gabler, L. R. (1969). "Economies and Diseconomies of Scale in Urban Public Service." Journal of Land Economics **45**(4): 425-434.

Previous studies have yielded somewhat different conclusions as to the effect of population size on city per capita expenditures. The analysis in this article was motivated not only by the differing conclusions, but also by the increased concern expressed by policy-makers with the effects of population growth and redistribution on urban areas in general and cities in particular. This article attempts to assess the effects of three population factors -- size, density, and rate of change -- on the provision of certain public services.

Gabler, L. R. (1971). "Population Size as Determinant of City Expenditures and Employment - Some Further Evidence." Land Economics **47**(2): 130-138.

The influence of various population factors on the level of per capita expenditures has attracted increased attention in the recent past, both in the professional journals and among policy-makers at all government

levels. Differences in city expenditures per capita have been linked with variations in such factors as city size, rate of population growth, and population density. Yet, earlier studies, using different units of observation and analytical approaches, have, not surprisingly, reached different conclusions. The purpose of this article is to utilize the now available 1967 Census data and to expand an earlier inquiry to encompass eight -- as opposed to three -- states.

Garcia-Sanchez, I. (2006). "Efficiency Measurement in Spanish Local Government: The Case of Municipal Water Services." Review of Policy Research **23**(2): 355-371.

In this study, the authors established a procedure for evaluating the efficiency of providing the water supply. This procedure has allowed the authors to find that the proposed indicators have a discriminating capability in the analysis of the service, and to reject criticisms traditionally assigned to the sensitivity of the data envelopment analysis (DEA) technique in relation to degrees of freedom. The article studies efficiency but is also illustrative of the use of the technique of Data Envelopment Analysis.

Grossman, P. J. (1987). "The Optimal Size of Government." Public Choice **53**(2): 131-147.

In the economic analysis of the theory of government, two views of government are evident. The Pigovian view sees government as a benevolent actor striving to correct for the inadequacies and excesses of an unrestrained marketplace. The Public Choice' view of government portrays government as the tool of special interest groups as likely to generate distortions as to correct them. In this paper, a model of government that incorporates both views will be developed and then empirically tested. The model developed assumes that all expenditures by the government are inputs into the private sector production. Treating government expenditures as inputs into the production of private sector output, there is some optimal size of government that maximizes private sector output. The model incorporates a general production function for private sector output. Output is a function of private labor, private capital, and government expenditures. The Pigovian and Public Choice views of government are reflected in the assumed impact of G on the marginal productivities of L and K. The model is tested using United States data and a Cobb-Douglas production function.

Gyimah-Brempong, K. (1987). "Economies of Scale in Municipal Police Departments: The Case of Florida." The Review of Economics and Statistics **69**(2): 352-356

This paper estimates scale economies in police production, using data from municipal police departments in the state of Florida. A multiproduct translog cost function is estimated using cross section data from Florida's

municipal police departments. It estimates a multi-product translog cost function and applies duality theorems to derive economies of scale of the underlying production function. The paper also tests for the existence of economies of scope. It is by estimating scale economies from different data sets under different conditions that the extent of scale economies in police production in general can be inferred. A different data set with more observations aids efficient estimation. The analysis disaggregates labor into sworn (police) and non-sworn (civilian) personnel and includes a capital input.

Hanes, N. (2001). Amalgamation Impact on Local Public Expenditures in Sweden. 6th Nordic Conference on Local Public Finance. Helsinki.
Two extensive municipal reforms have substantially reduced the number of municipalities in Sweden. The main objective of the first municipal reform in 1952 was to form municipalities with no less than 2 000 inhabitants in order to increase administration efficiency and to exploit economies of scale in the provision of local public services. This paper studies whether the growth in local public expenditures differed between the newly formed municipalities and the ones that were not affected by the reform. The empirical analysis is based on data for the years 1951, 1953 and 1959.

Hirsch, W. (1959). "Expenditure Implications of Metropolitan Growth and Consolidation." The Review of Economics and Statistics **41**(3): 232-241.
Metropolitan areas are growing fast and so are their problems. To make this growth smoother and fiscal problems less burdensome, the consolidation of metropolitan area governments is widely advocated on the premise that it will reduce per capita expenditures of local government services. It is argued that, just as there are economies of scale in manufacturing, average municipal costs and expenditures likewise decline as the size of the local government unit increases. This paper will attempt to develop a theoretical framework for analyzing the question "What are the likely expenditure effects of metropolitan growth and consolidation?" The deductive answers will then be tested by an empirical analysis of 149 government units in the St. Louis metropolitan area and some Massachusetts cities.

Holcombe, R. G., and D. W. Williams (2008). "The Impact of Population Density and Government Expenditures." Public Finance Review **36** (3): 359-373.
Data from 487 municipal governments with populations greater than 50,000, as reflected in Historical Finance Database from the 2000 U.S. Census, are examined to see the relationship between population density and per capita government expenditures. It uses aggregate data on expenditures and is therefore subject to the same concerns plaguing most studies. This study examines the proposition that sprawling development increases government costs relative to more compact urban development

by looking at the impact of population density on the cost of providing government services. The relationship between per capita total expenditures and population density has policy relevance because it indicates that when all government expenditures are taken into account, policies that increase population density will not reduce per capita government expenditures and, in larger cities, will lead to higher per capita government expenditures.

Katsuyama, B. (2003). "Is Municipal Consolidation the Answer?". Retrieved November 10, 2008, from <http://www.mrsc.org/Publications/mrnews/mrnews0603.aspx>.

This article reviews the literature on size and evaluates the effectiveness of consolidations. The article begins by stating that fragmentation is usually assumed to be inefficient, but remarks that there is a growing body of evidence indicating that this conventional wisdom may not always be true. It compares the arguments for and against consolidation and reviews some of the research and case studies. The article suggests alternatives to consolidation that may provide alternative paths to efficiency.

Koven, S. G., and Don F. Hadwiger (1992). "Consolidation of Rural Service Delivery." Public Productivity & Management Review **15**(3 (Spring)): 315-328.

The efficiency of rural counties in Iowa varying in size is evaluated and potential structural changes are reviewed with those findings considered. In particular, the decline of both population and revenue in counties in rural Iowa is seen as pushing the need for a structural change such as consolidation. The article also discusses obstacles to consolidation that are associated with a rural environment.

Long Island Index (2007). "A Case Study Comparing Governance, Taxes and Local Services on Long Island and in Northern Virginia: Executive Summary." Long Island Index. Retrieved November 10, 2008, from http://www.longislandindex.org/fileadmin/pdf/pollreport/Long_Island_Index_Case_Study_Executive_Summary.pdf.

According to the Long Island Index 84% of Long Islanders believe that high taxes are an “extremely” or “very serious” problem and a near majority (45%) cites it as the major local problem. With an eye to finding out how other regions address the issue of local taxes, the Long Island Index compared Long Island to several peer suburban regions and found one stood out in stark contrast. Northern Virginia (including Fairfax County, Loudoun County, Fairfax City and the city of Falls Church) has significantly lower per capita property taxes than Long Island. In order to explore this question, the Long Island Index commissioned two studies. First, they asked the Center for Governmental Research (CGR) in Rochester, New York to conduct an analysis that compared local taxes in each region in order to clarify the key cost drivers. Second, they asked

Stony Brook University's Center for Survey Research to conduct a survey comparing how residents in the two regions felt about the services provided by local governments. They found there was the potential for greater cost savings coupled with higher satisfaction.

Mabuchi, M. (2001). "Municipal Amalgamation in Japan." Retrieved November 24, 2008, from <http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2005/07/26/000090341_20050726131910/Rendered/PDF/330380JP0wbi37175.pdf>.

This paper describes the causes and consequences of post-war municipal amalgamations in Japan. It shows that recent amalgamations have been inspired in part by the desire to ensure that municipalities thus formed had sufficient capacity to deliver important public services in such areas as education, sanitation and welfare. It notes that there may be cost-efficiency gains associated with amalgamation in that the costs of delivering public services in Japan appear to be lower for larger municipalities (up to a point). Furthermore, case studies of some prefectures show that voter turnout in elections is not significantly affected by amalgamations.

Maggiotto, M. A., and Frank McKenna, Jr. (1992). "Assessing Productivity and Management in Local Government: [Introduction]." Public Productivity & Management Review **15**(3 (Spring)): 309-313.

This article reviews productivity and management in local government for a symposium. The authors suggest the tools of policy analysis and program evaluation become more important in periods of relative scarcity. Further, they focus on small local governments as having the most to gain from these tools. The article reviews various techniques in policy analysis and program evaluation as an overview of the productivity tools that are available.

Mera, K. (1973). "On the Urban Agglomeration and Economic Efficiency." Economic Development and Cultural Change **21**(2): 309-24.

This article evaluates the effects of population size on economic development but some comments are made about the impact on government expenditures from size or other factors. The article addresses wealth of the population as a determinant of government cost per capita expenditure.

Moomaw, R. D. (1981). "Productivity and City Size: A Critique of the Evidence " The Quarterly Journal of Economics **96**(4): 675-688.

This article provides a critique of two leading articles in the literature on productivity (economic productivity, not government productivity) and city-size. The results of this critique include a change in estimates of the productivity advantages of large cities. In particular, extant estimates of the elasticity of productivity with city size are revised downward by over

100 percent for the manufacturing sector and about 25 percent for the entire urban economy. After revision, productivity advantages of larger cities are found to be much larger for the nonmanufacturing sector than for the manufacturing sector. Hence, revitalization policies for large cities should be focused on nonmanufacturing sectors.

Moore, A., James Nolan, and Geoffrey F. Segal (2005). "Putting Out the Trash: Measuring Municipal Service Efficiency in U.S. Cities." Urban Affairs Review **41**(2): 237-259.

The authors discuss Data envelopment analysis (DEA) as a response to their view that theliterature describing the performance of municipal services often uses imperfect or partial measures of efficiency. DEA has emerged as an effective tool for measuring the relative efficiency of public service provision. This article uses DEA to measure the relative efficiency of 11 municipal services in 46 of the largest cities in the United States over a period of 6 years. In addition, this information is used to explore efficiency differences between cities and services and provide input into a statistical analysis to explore factors that may explain differences in efficiency between cities. Finally, the authors discuss municipal governments' use of performance measures and problems with collecting municipal data for benchmarking.

Mower, J. (2003). City-County Consolidation and Other Regional Approaches to Reorganizing Local Government: Lessons Learned from Examples and Experts.

This memo, an informal but comprehensive document prepared for the City of Syracuse, includes a selection of lists, charts, and excerpts from research conducted related to municipal mergers in varying metropolitan statistical areas (MSAs). The author summarizes the latest city-county merger of Louisville, Kentucky and summarizes case studies from several other MSAs. Substantive lists of the "easiest" and "hardest" methods of providing shared services are included, and reasons for failure or success of municipal mergers are noted.

Nussbaum, P. (2007). School-tax reformers face hard alternatives. The choice: Excellence or economy. The Philadelphia Inquirer.

This newspaper article examines school district costs, size, and academic performance according to national rankings of the states with New Jersey schools as its focus. It reviews state and federal funding differences as well as local property taxes. The article also relates opinions and statements on local control, optimal size and cost.

Ostrom, E. (1972). "Metropolitan Reform: Propositions Derived from Two Traditions." Social Science Quarterly **53**(3): 20.

This essay examines the theoretical structure behind the metropolitan reform movement, as well as alternative theoretical structures, to better focus future empirical research on the validity of the propositions contained in the theoretical structures. With a better understanding of the relationships between variables such as size and multiplicity of governmental units; output, efficiency, and equal distribution of costs; responsibility of public officials; and citizen participation, reforms can be devised which will produce desired, rather than undesired, outcomes. The essay also discusses the need for agreed upon definitions of terms and their operationalizations.

Ostrom, E., and Gordon Whitaker (1973). "Does Local Community Control of Police make a Difference? Some Preliminary Findings." American Journal of Political Science **17**(1): 48-76.

Using a comparative research design, this study examines the consequences of organizing neighborhood patrol functions on a large scale by a city-wide police force or on a small scale by local communities. The research was conducted in three small independent communities adjacent to Indianapolis, and three matched neighborhoods within the city. The findings indicate a consistent pattern of higher levels of police performance in the independent communities when compared to the Indianapolis neighborhood. The findings strongly suggest that in the area studied, small police forces under local community control are more effective than a large, city-wide controlled police department in meeting citizen demands for neighborhood police protection. Further studies have been initiated to ascertain if the patterns found in this metropolitan area are also present in other areas.

Ostrom, E. (1976). "Size and Performance in a Federal System." Publius **6**(2): 33-73.

The author is concerned with the call for municipal reform based on untested theories. In particular, the assertion that the number of police jurisdictions should be curtailed in favor of larger police departments has no support from the evidence. The article summarizes empirical studies on the impact of size on efficiency of government services, particularly police services

Pachon, H. P., and Nicholas P..Lovrich, Jr. (1977). "The Consolidation of Urban Public Services: A Focus on the Police." Public Administration Review **37**(6): 38-47.

A set of literature in public administration has recently emerged, associated with the Public Choice perspective, which argues against metropolitan consolidation and police consolidation specifically. This article reviews the major assertions which the "anti-consolidationists" make in specific reference to the consolidation of urban police departments: (1) that larger police departments are not more efficient or economical; and (2) that citizen satisfaction with urban police services varies inversely with the size of the municipality. On the first assertion the authors find that evidence is still inconclusive regarding the economy and efficiency of larger police departments. On the second assertion, the results indicate that, contrary to the anti-consolidationist viewpoint, citizen satisfaction with police services is more a reflection of the differentiated socio-economic characteristics of central cities and suburban cities than a function of city size.

Percy, A. (2003). "Why Smaller Councils Make Sense." Australian Journal of Public Administration **63**(3): 74-81.
This article presents a case for smaller local governments based on notions of economic efficiency, community identity, service responsiveness, and political accountability. The arguments of skeptics (or those favoring greater council amalgamations) are challenged and refuted. The answer is to break up metropolitan councils into smaller political units and amalgamate their back offices into contestable shared service centers.

Peters, J. W. (2007). Lips Move, but No Mergers Result. New York Times.
This newspaper article reports the perspectives of New Jersey state legislators, state officials, local mayors, and municipal consultants when they were meeting at the 2007 New Jersey League of Municipalities convention. The focus of the article is on the debate about consolidation - whether it will produce the cost savings its proponents claim.

Revelli, F., and Per Tovmo (2007). "Revealed Yardstick Competition: Local Government Efficiency Patterns in Norway." Journal of Urban Economics **62**(1): 121–134.
This paper investigates whether the production efficiency of Norwegian local governments exhibits a spatial pattern that is compatible with the hypothesis of yardstick competition. In order to check whether yardstick competition is really responsible for the observed spatial pattern and rule out alternative theoretical explanations, the paper exploits unique information from a survey on local politicians' attitudes towards comparative evaluation of local bureaus' performances against other jurisdictions' (benchmarking).

Rouse, P., and M. Putterill (2005). "Local Government Amalgamation Policy: A Highway Maintenance Evaluation." Management Accounting Research **16**(4): 438-463.
Evaluating the effects of a change in public policy setting is a critical element in the chain of accountability. Factors such as effectiveness and efficiency in government operations are often difficult to measure. In this study of efficiency outcomes, the authors follow events before and after significant structural change arising from local authority amalgamation. The study focuses on highway maintenance and uses Data Envelopment Analysis (DEA) to evaluate whether greater efficiency was achieved. Results (confined to highway management activities) show no evidence

that amalgamation was justified in terms of diseconomies arising from smallness (i.e. increasing returns to scale). While new governance practices introduced contemporaneously lifted the level of performance of local authorities in terms of higher technical efficiency, there is no evidence that the amalgamation policy contributed to this improvement. The policy impact evaluation methodology developed in this paper has potential for application to other local government service activities.

Sancton, A. (2001a). "Municipalities, Mergers and the Outward Expansion of the City." Journal of Eastern Townships Studies **Fall** (19).

As the previous discussion has shown, it is quite possible for a single urban area to evolve in such a way that it contains many separate municipalities. Adjoining rural municipalities might have become urban over time; new urban municipalities might have been established within a former part of a rural municipality; two previously distinct urban areas might have grown into each other; or all or some of these processes might have occurred simultaneously. Ever since the mid-nineteenth century, there have been politicians, civil servants, academics, and sometimes even real-estate developers who have observed such phenomena with growing concern. They began to refer to the increasing number of municipalities within a single urban area as "fragmentation." This article discusses the need for redrawing municipal boundaries, particularly in light of different demands for service in rural and urban communities.

Segal, D. (1976). "Are There Returns to Scale in City Size? ." The Review of Economics and Statistics **58**(3): 339-350.

This article examines the relationship between city size and economic production, such as output per worker. It does not address government efficiency, although production efficiency is a general benefit to the society.

Singell, L. D. (1974). "Optimum City Size: Some Thoughts on Theory and Policy." Journal of Land Economics **50**(3): 207-212.

The author relates size to a number of factors, including municipal expenditures. The perspective of the article is that there may be a reason to control urban growth, but that absent a federal policy to do so, there is reason to believe the limitations may lead to inefficiencies. Government expenditures are only one of the variables investigated.

Slack, E. (2007). "Managing the Coordination of Service Delivery in Metropolitan Cities: the Role of Metropolitan Governance ". Retrieved November 24, 2008, from <http://econ.worldbank.org/external/default/main?pagePK=64165259&theSitePK=469372&piPK=64165421&menuPK=64166093&entityID=000158349_20070814091849>.

This paper examines different models of governing structure found in metropolitan areas around the world. It evaluates how well these models achieve the coordination of service delivery over the entire metropolitan area as well as the extent to which they result in the equitable sharing of costs of services. Based on theory and case studies from numerous cities in developed and less developed countries, the paper concludes that there is no "one size fits all" model of metropolitan governance.

Sorensen, R. J. (2006). "Local Government Consolidations: The Impact of Political Transaction Costs." Public Choice(127): 75-95.

Local government in Norway comprises a large number of small municipalities. Cost efficiency can be improved by consolidating local authorities, and central government has designed a framework to stimulate voluntary mergers. Existing theories suggest that political transaction costs will impede consolidations. The author offers an explicit test of several efficiency and cost propositions based on data for Norwegian local government.

Stevens, P. A. (2005). "Assessing the Performance of Local Government." National Institute Economic Review **193**(1): 90-101.

This article considers the measurement of performance in the public sector in general, focusing on local government and the provision of library services by English local authorities in particular. The author considers two methodologies that assess the performance of local authorities in terms of the efficiency with which they provide services, and considers methods that allow for the identification of exogenous influences on performance such as the socio-economic profile of the population served by the authority. The author finds that although both methods' results appear similar, the implications for potential cost savings vary widely. Omitting to account for background factors leads to an overstatement of the level of inefficiency and hence the scope for reducing expenditure.

Trenner, R. (1998). GOVERNMENT; One Lawmaker's Ideas on Peeling Away Layers of Redundant Services New York Time.

This newspaper article reviews Alan Karcher's then forthcoming book "Multiple Municipal Madness". Opinions of academicians about the statements in the book and the perspective of the book are included in the article. The book discusses the number of municipal governments in New Jersey and expresses a need to consolidate them into fewer units.

Tynan, N., and Bill Kingdom (2005). "Optimal Size for Utilities?" Public Policy for the Private Sector. Retrieved October 13, 2008, from <http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2005/02/28/000090341_20050228132513/Rendered/PDF/315620PAPER0VP2830tynan.pdf>.

Using data from 270 water and sanitation providers, this article investigates the relationship between a utility's size and operating costs. The current trend toward transferring responsibility for providing services to the municipal level is driven in part by the assumption that this will make providers more responsive to customers' needs. But findings reported here suggest smaller municipalities may face higher per customer costs and could lower costs (and prices for consumers) by merging.

Van Ryzin, G. (2004). "Expectations, Performance, and Citizen Satisfaction with Urban Services." Journal of Policy Analysis and Management, 23(3).

This reference helps to explain the relationship between citizen expectation and citizen satisfaction with government performance. The expectancy disconfirmation model has dominated private-sector research on customer satisfaction for several decades, yet it has not been applied to citizen satisfaction with urban services. The model views satisfaction judgments as determined - not just by product or service performance - but by a process in which consumers compare performance with their prior expectations. The study uses data from a New York City citizen survey,. Additional implications for research and public management practice are discussed.

Van Ryzin, G. (2006). "Testing the Expectancy Disconfirmation Model of Citizen Satisfaction with Local Government." Journal of Public Administration Research and Theory, 16(4).

This reference helps to explain some of the conclusions in the report on optimal size and efficiency. It is important that public administration researchers and practitioners understand how citizens form satisfaction judgments regarding local government services. A prior study by Van Ryzin (2004) found strong support for an expectancy disconfirmation model of citizen satisfaction, which focuses on the gap between performance and expectations. This model has been tested for decades in studies of private sector customer satisfaction, yet it is little known and applied in the field of public administration. The present study seeks to replicate the Van Ryzin (2004) results, which were based on a telephone survey in New York City, using a nationwide sample and a much different survey methodology, namely, an online, self-administered survey of a national panel. In addition, this study tests the sensitivity of the results to two alternative measures of disconfirmation (or the gap between performance and expectations). Results using subtractive disconfirmation confirm the basic expectancy disconfirmation model, but results using perceived disconfirmation do not, calling into question the policy and management implications of the prior study.

World Bank (2008a). "Inefficiency of Rural Water Supply Schemes in India " Policy Paper Retrieved October 13,2008, from <http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2008/07/23/000333037_20080723003033/Rendered/PDF/447910PP0P09411741301PUBLIC10PAPER2.pdf>.

In the last one-and-a-half decades, there has been an annual average expenditure of about one billion US dollars in the rural water supply sector in India. This has led to an appreciable increase in coverage (from 75 percent in 1997 to 97 percent in 2006, according to official statistics), but the overall improvement in the provision of water supply in rural areas has not been commensurate with the level of expenditure undertaken due to inefficiencies and wastages of various kinds. The 10-state study on the Effectiveness of Rural Water Supply Schemes, undertaken by the World Bank at the request of the Government of India, has looked at various aspects of 'inefficiency' along with measures to address these issues.

World Bank (2009). World Development Report 2009: Reshaping Economic Geography, Chapter 4: Scale Economies and Agglomeration Worldbank, The World Bank**:** 126-145.

Developing economies are entering a new realm of agglomeration. A century of experience indicates that as countries develop from agricultural to industrial to service-oriented production, entrepreneurs and workers leave behind not just their villages and their agrarian occupations, but also a world in which scale does not matter much. More and more of them enter not just larger and denser settlements, but also a world in which scale matters - where production and distribution enjoy scale economies, especially those associated with places. Proximity matters more, not just for access to markets for goods and services, but also for access to ideas. Thus, the need for shared services and economies of scale is of increasing importance in these developing areas. This article focuses on economic productivity rather than government productivity.

Worthington, A. (1999). "Performance Indicators and Efficiency Measurement in Public Libraries." Australian Economic Review **32**(1): 31-42.

A sample of one hundred and sixty-eight New South Wales local government libraries is used to analyze the efficiency measures derived from the non-parametric technique of data envelopment analysis. Depending upon the assumptions employed, 9.5 per cent of local governments were judged to be overall technically efficient in the provision of library services, 47.6 per cent as pure technically efficient, and 10.1 per cent as scale efficient. The study also analyses the posited linkages between comparative performance indicators, productive performance and non-discretionary environmental factors under these different model formulations.

APPENDIX B
Methodology

SPPA employed a methodology for the literature reviews that consisted of thorough searches in all of the major databases representing social and policy journals. In consultations with SPAA faculty, the research associates used the knowledge from the early stages of the research to refine and expand the search, as was appropriate. SPAA created or used the following tools to assure we accomplished the aims of the Commission:

- LUARCC questions from the RFP
- Bibliographic databases
- Search terms specific to each report
- Reference database
- Annotated bibliographies
- Articles/web resources

In the first phase of the basic strategy, SPAA devised appropriate search terms and used them to search all the relevant bibliographic databases. Promising articles were recorded as citations in the reference database (EndNote®) and the full-text article content was saved to the article file (as a PDF).

In the second phase of the search, research associates assigned to the project thoroughly examined the articles for findings that addressed LUARCC's questions. The research associates recorded each finding in the reference database, attaching it to the question it addressed and evaluating the degree to which the article or information resource substantiated the finding. The research associates completed this substantiation, weeding out articles based solely on ideology and rating the remaining articles according to the amount of evidence or the concreteness of the argument presented. During this process, team members reported any new search terms or resources they encountered to the project librarian and project director. Subsequent searches utilized this additional information.

The supervising faculty member assigned to this project and the project director reviewed the results of the first phase of the search, which found the potential articles. When necessary, they redirected the search to clarify information or find new sources. In addition, the faculty members and project director reviewed each finding for relevance to the LUARCC questions.

SPAA sought LUARCC's input through the review of an outline of the proposed methodology to ensure that the literature search was comprehensive and focused on the questions LUARCC raised. Because of the iterative process used in the information review, the early results of our search enhanced the project tools further.

LUARCC Questions

SPAA extracted the questions from the LUARCC RFP into a spreadsheet and distributed it to all team members assigned to the project. The research team coded each of these questions with a Question ID, using the listing in the spreadsheet. This allowed the research associate to link a finding from an article to the question it addressed using the abbreviated Question ID. The questions and Question ID are in the appendix.

Bibliographic Databases

The Bibliographic Database appendix lists all the literature and news databases and other information resources, such as websites and books that SPAA used to find relevant information for LUARCC. The researchers and the project librarian knew certain resources were more comprehensive and relevant for this project. SPAA focused on *Lexis/Nexis Academic* as a resource for periodicals, including newspaper articles, journal articles, and legal documents; *Academic Search Premier* as the best resource for academic journals; *Business Source Premier* as a similar resource; and *Public Affairs Information Service* for government reports, monographs, and articles.

Search Terms

The search within the bibliographic databases and in other resources used the following terms::

- Optimal size
- Economy of scale
- Diseconomy
- Size/efficiency
- Fragmentation
- Small government
- Per capita efficiency
- Scale of operation
- Size/productivity

The searches always used the following additional governmental terms as limiters:

- Municipality
- Local government
- Borough
- Village
- Town
- Township
- City
- County
- State

Since the search engines differ in their filter capabilities (and the Boolean logic which drives some of them), the research associates used their familiarity with literature searches to make efficient search decisions. They focused on North American articles, cross-cultural studies that included the United States, or other articles, despite their geographic origins, if they were applicable to the subjects the Commission wanted to investigate in a New Jersey context.

Winnowing the search results while casting a broad enough net is not always easy, and never automatic, as our preliminary analysis showed. The research associates, with faculty guidance, used their expertise in the content area they investigated and their experience with literature reviews as doctoral students to make the searches practical and the results comprehensive and responsive.

Reference Database – EndNote®

SPAA summarized the important information from the articles and reports found in the literature searches in EndNote®, a high-quality bibliographic software program by Thompson Reuters. As part of its work products, SPAA will provide a copy of EndNote**®** to LUARCC with the on-line annotated bibliography for all five projects it completed. A printed copy of the annotated bibliography for this project is Appendix A to this report.

The findings are the core of the reference database and of this project. The findings contain a brief extract from the article or a summary of a key point that links the article to LUARCC's questions. The following information is contained with the findings to provide a quick review:

- **Question ID** – this will contain a project designation and identify the specific question addressed
- **Finding** – a brief description of the finding, conclusion or discussion
- **Cases** – if it is based on an empirical study, the number of cases that support the finding
- **Basis** – reviewer's evaluation of the substantiation of the finding in the source on a 0 to 4 scale. If there is no basis, it is rated a 0; poor evidence, a 1; some evidence, 2; well substantiated, 3; considered a fact, 4
- **Unit** – the government unit or region cited in the finding

It is not necessary to use EndNote**®** to make the most of the project completed by SPAA. Rather, the working details contained in EndNote**®** are there to support this report.

Library of Documents

Each article, or an appropriate extract from the article, report, book excerpt or other research document, has been stored and will be accessible in a separate file as a Word Document or PDF. LUARCC will be able to link to it from the EndNote® reference database that SPAA will provide as a final work product. It will contain the full text of appropriate parts of the information sources found. Hence, it will allow LUARCC or its staff to review the original information that SPAA has summarized, allowing the Commissioners to be confident about their decisions as LUARCC goes forward.

Preparing the Final Report

SPAA used the findings in the EndNote® annotated bibliography to organize the report for each project around the questions initially specified by LUARCC in the original RFP. In preparing the report, the faculty and project director reviewed the findings, interacted with the research associates who had found and read the articles, and, when warranted to resolve any ambiguity, read the original texts. This final review generated SPAA's conclusions in this report. In addition to this report, SPAA will provide an overall summary report for all five projects it completed.

APPENDIX C
RFP QUESTIONS

RFP Question	Question ID
Is there an optimal size or range of sizes for a municipal government entity from the standpoint of efficiency and to minimize duplication of efforts? Are there diseconomies of scale associated with larger governments requiring proportionally more administration?	OS
Evaluate and rank the effect of population density (a pattern of sprawl versus compactness)	OS1
Evaluate and rank the effect of physical expanse of the municipality	OS2
Evaluate and rank the effect of demographic characteristics of the population (wealth, poverty, age characteristics, education level, demand for services)	OS3
Evaluate and rank the effect of the extent to which important services are regionalized (for example, schools, the existence of regional utilities and emergency service compacts which limit municipal service responsibilities)	OS4
Evaluate and rank the effect of character of land use (bedroom community versus heavily commercial or industrial tax base)	OS5
Evaluate and rank the effect of natural features (limitations on development owing to aquifers, steep slopes, other environmental sensitivities)	OS6
Evaluate and rank the effect of age of community and infrastructure (older industrial cities versus newer settlements on the ex-urban fringe)	OS7
Evaluate and rank the effect of demands on municipal services and infrastructure (seasonal peaks, bedroom community versus employment hub)	OS8
Evaluate and rank the effect of stress on the property tax base (high proportion of tax exempt property, land use restrictions that inhibit ratable growth)	OS9
The optimal size of municipal governmental jurisdiction that maximizes cost efficiency in municipal service provision	OS10
The identification of a range of optimal sizes depending upon municipal characteristics such as any enumerated above	OS11
Whether optimal size varies based on what services are provided at the municipal level/the intergovernmental context	OS12
Other variables which would be helpful for commission members to understand in attempting to identify criteria for consolidation	OS13

APPENDIX D
BIBLIOGRAPHIC DATABASES

Academic Search Premier
Books in Print with Reviews
Business Source Premier
Catalog of U.S. Government Publications
Conference Board Research Collection
CQ Researcher
Eagleton Poll Archive
Factiva
Gartner Research
GPO Access
Historical Statistics of the United States: Millennial Edition
Human Population & Natural Resource Management
Index to Legal Periodicals Full Text
Investext Plus
Lexis/Nexis Academic
Lexis/Nexis Statistical
National Technical Information Service
New York Times
Public Affairs Information Service - International and Archive
SA ePublications Social Science & Humanities Collection
Social Sciences Full Text
Statistics Canada's E-STAT
TV-NewsSearch: The Database of the Vanderbilt Television News Archive
Value Line Research Center
Wilson OmniFile Full Text, Mega Edition
Worldwide Political Science Abstracts

Other Information Sources

Research and Information Resources for Public Administration
Using the Political Science and Government Literature
Public Performance and Measurement Review
http://spaa.newark.rutgers.edu/sharedservice.html
SPAA's Public Performance and Reporting Network