


CONSOLIDATING OR
MERGING THE PUBLIC
SERVICE PROVISION IN
VIRGINIA CITIES AND
COUNTIES: WHERE CAN
WE SAVE THE MOST
MONEY?



Interest in consolidating or merging the provision of some publicly provided services in Hampton Roads has been a persistent topic of interest in the Commonwealth. The rationale usually has been twofold – mergers and consolidations could save money and at the same time improve the quality of services offered. Thus, many want to explore combining police forces, educational systems, Commonwealth’s Attorney offices and the like.

The National League of Cities (www.nlc.org) takes a broad view of mergers and consolidations and asserts that at least six benefits could accrue from such combinations:

- **Cost Savings:** This is the classic reason motivating most joint service provision agreements between and among jurisdictions. Lower unit costs appear because larger operating units enable savings (“economies of scale”).
- **Increased Efficiency:** Unification might reduce duplicative expenditures, especially overhead costs.
- **Increased Quality:** Increased scale in the provision of services could result in greater citizen choice and enhanced quality of those services.
- **Improved Resource Base:** This is essentially a political argument. Unification of jurisdictions generates more political clout, resulting in a greater ability to attract revenue and achieve goals.

- **Enhanced Ability to Plan:** The expectation is that unification results in more rational planning and thereby reduces the number of contradictory policies and operations.
- **Improved Accountability:** Because many citizens live in one jurisdiction but work and recreate in another, it can be difficult to assign responsibility for critical metropolitan services such as traffic, sanitation, crime prevention, etc., because these activities span boundaries. Unification is seen as a way to reduce such problems.

The Salient Question

Let's accept the notion that there could be benefits that accrue to governmental units and citizens if some (though not all) public services were combined/merged/consolidated across city lines. The salient question is: Which ones? How do we identify the prime candidates for the consolidation or merger of services (CMS) in Virginia's 95 counties and 39 independent cities?¹

A perusal of discussions surrounding proposals for CMS in other cities around the United States reveals that the *sine qua non* of such discussions is cost savings. If government officials cannot promise cost savings from CMS proposals, then these ideas nearly always falter. Yes, arguments that CMS will increase the quality of services supplied do receive consideration, as do assertions that CMS will result in increased political clout. Nevertheless, decision makers and citizens usually focus intently on cost savings as their motivation for proposing public service CMS.

Cost arguments are more easily understood (and usually more easily measured) than are assertions concerning anticipated quality enhancements or political benefits. It is difficult to measure the quality of public service provision when increased political power for one group may mean decreased

¹ Virginia also boasts more than 190 incorporated "towns," a few of which are larger than some of its 39 independent "cities." Cities are independent jurisdictions; towns are situated within one or more counties. Cities may be surrounded by counties, but are independent of the counties. Thus, city residents do not vote for county officials or pay county taxes. However, town residents vote for county officials and pay county taxes. Towns have not been included in this analysis because of their generally small size (though the "town" of Blacksburg, for example, has more than 40,000 residents, about 10 times as many as the "city" of Norton).

political clout for another. Thus, cost arguments usually dominate CMS discussions.

In this chapter, we focus on identifying which public services now being provided by the counties and cities of Virginia will offer the greatest cost savings to participating governmental units if these units were to decide upon selected CMS initiatives. Our analysis will reveal that there are more than one dozen public services where investigating consolidation and merger of those services makes sense.

We do not deny that there are many political and sociological motives that either spur or deter CMS. We're all aware of ancient divisions among our counties and cities as well as demographic and social differences that ultimately impinge on conversations concerning CMS between public governmental units. Instead, stating the question in terms of money recognizes the practicality that without demonstrable potential cost savings, CMS discussions are not likely to get out of the proverbial batter's box.

Our Approach To Identifying The Best Candidates For CMS

Virginia's Auditor of Public Accounts annually produces a report that discloses the total amount of money spent on more than two dozen public services as well as each city's per capita expenditures on those services (www.apa.virginia.gov). These cost data are reported by the auditor for all of Virginia's 95 counties and 39 independent cities. For example, in 2013, Manassas Park spent \$428,819 (\$228.90 per capita) on its city court system. Data such as these in the auditor's annual report constitute the primary basis for a rigorous analysis of the costs of service provision and the merits of possible CMS initiatives in Virginia's counties and cities.

The reality is that the service delivery costs reported by the auditor are numbers that do not take into account a host of factors that might cause one city to spend more than another city on a specific public service. For

example, one must consider the impact that major differences in prices, wages and incomes among Virginia's cities have upon their expenditures. For example, in 2013, the cost of living was 37.7 percent above the national average in Alexandria, but only .6 percent above the national average in Bristol. Consequently, it would be misleading to assume that inefficiency is the only reason that Alexandria spent \$109.52 per capita on its courts in 2013, while Bristol spent only \$59.35 per capita on the same service.

In order to establish a level economic playing field where public service costs are concerned, one must adjust them for the differences in the cost of living just noted. C2ER (the Council for Community and Economic Research, www.c2er.org) publishes a cost-of-living index (COLI) for every city and county in the United States, and we use that index in all of our statistical analyses. We are interested in "real" cost differentials, not differences in the cost of living.

In order to make our results more easily understood, we index all of the per capita cost data so the average value is 100. For example, in the case of K-12 expenditures on instruction, Buchanan County spent a total of \$15,344,250 in 2013; this was \$888.23 per capita. Since the average per capita expenditure for the 134 counties and cities in Virginia was \$1,183.68, Buchanan County is assigned an index number of $\$888.23/\$1,183.68 = 75$ for this service.

It's clear that the expenditures a city makes on public health, law enforcement or K-12 education reflect its peculiar circumstances and needs as they are interpreted locally. The demographic and economic structure of each city makes a difference. For example, a city with a higher rate of poverty would be expected to spend more on welfare and social services. To wit, Poquoson spent \$52.01 per capita on welfare and social services, while its neighbor Newport News spent \$225.51 per capita. Per se, this expenditure differential does not necessarily represent inefficiency, but rather the demographic and economic realities of the two different cities.

In order to deal with the effects of the distinctive characteristics of each city on its public service expenditures, one must estimate what each city likely would be expected to spend on this service, given its peculiar characteristics. This requires developing an estimating equation capable of predicting accurately what each city's per capita expenditures on a public service would be expected to be, given its demographic and economic circumstances.

What demographic, economic and political factors most likely influence spending on particular public services? We focused upon the following 11 factors, each of which plausibly influences the provision of public services in Virginia cities and counties:

The per capita expenditure of each city "i" on each service "j" (PCEij) depends upon:

- **City Size/Scale (POP):** This is measured by each city's population in all cases except public K-12 education, where scale is measured by the number of students in the city's school district. If economies of scale are present, then per capita costs will decline as population increases – holding all other influences constant. Scale (city size or school district size) is a critical variable when mergers and consolidations of public services are being considered.
- **City Size/Scale Squared (POP SQ):** Including the squared value of the POP variable allows for the possibility of nonlinear relationships between expenditure costs and city size/scale – costs per capita are allowed to increase or decrease in nonproportional ways as size increases. Put simply, including this variable allows for the possibility that the relationship between expenditures per capita and city size isn't best reflected by a straight line, but instead a curve.
- **Population Density (POP DENS):** Higher population densities may require higher levels of expenditures on some public services because the number of human interactions and complications rises rapidly as population density increases.
- **Cost-of-Living Index (COLI):** Including each county or city's C2ER cost-of-living index recognizes cost differences that have nothing to do with efficiency, but instead reflect the higher or lower cost of doing business in a county or city.
- **Poverty Rate (POV RATE):** It is reasonable to expect that expenditures upon certain public city services will be sensitive to city poverty rates. Even so, the impact of poverty upon law enforcement expenditures might well be different from the impact of poverty upon cultural expenditures.

- **Hosted Private-Sector Jobs to Population Percentage (PRIV JOBS PCT):** Cities that host high proportions of private-sector jobs relative to their populations (that is, cities to which many individuals commute to work) plausibly must expend funds upon infrastructure, traffic and law enforcement, and similar services to accommodate those job holders. However, such cities are not responsible for providing other services, such as K-12 education, to the inward-bound job commuters.²
- **Fiscal Stress Rank (FISCAL STRESS RANK):** Annually, the Commonwealth’s Department of Housing and Community Development (www.dhcd.virginia.gov) produces a report that ranks each city and county in terms of their “composite fiscal stress,” that is, the ability of each to pay for the apparent needs it faces. The supposition is that the greater a city or county’s ability to pay (given its circumstances), the more it will spend on public services (though state financial assistance dulls this effect).
- **Homeowner Percent (HOME PCT):** Cities with higher proportions of homeowners (as opposed to renters and apartment dwellers) plausibly could prefer higher expenditures upon certain services, such as schools.
- **County or City (CITY DUMMY):** Both counties and cities are governmental units, but they are different animals in terms of their obligations, demographics and revenue capacity. This dummy variable, which assumes a value of 1 if the governmental body is a city and 0 otherwise, is designed to pick up such differences.
- **Revenue Per Capita (REV PER CAP):** This governmental version of “If you build it, they will come” instead is, “If you raise money in taxes, you will spend it.” This variable reflects both the potential and actual revenue-raising activity of the counties and cities.
- **Percent Commonwealth Funding (COMMON REV PCT):** This variable measures the percentage of a city’s expenditures that are self-funded by a particular city. A reasonable expectation is that

cities’ spending on public services will increase when the state and federal governments pay for increased proportions of that spending; however, the opposite could be true if those “outside” funding sources are viewed as not being dependable.

In the case of public school expenditures, two “scale” variables involving student headcount are used rather than city population:

- **Student Headcount Enrollment (ENROLL):** Student headcount enrollment measures the size of each city’s school district and is critical in assessing the existence of economies of scale in the provision of K-12 educational services.
- **Student Headcount Enrollment Squared (ENROLL SQ):** As true for the POP SQ variable described previously, this variable allows for the possibility that the relationship between costs and school district size is best reflected by a curve rather than a straight line.

The Results

The results presented below constitute a cost-of-living-adjusted analysis of the spending of Virginia’s 95 counties and 39 independent cities for 23 distinct public services. Five of these services involve K-12 education.

The statistical source of the results is a conventional linear regression estimating equation.³

We take into account the 11 factors noted above in estimating how much we would reasonably expect each of the 134 governmental units to spend on a particular public service, per capita, given its demographic and economic situations. We then utilize the results for two purposes:

- To determine if economies of scale exist in the provision of this public service such that it might be a viable candidate

³ $PCE_{ij} = a + b_1(POP) + b_2(POP SQ) + b_3(POP DENS) + b_4(COLI) + b_5(POV RATE) + b_6(FISCAL STRESS) + b_7(HOME PCT) + b_8(JOBS PCT) + b_9(CITY DUMMY) + b_{10}(REV PER CAP) + b_{11}(COMMON PCT)$

² Public-sector jobs might make a difference as well, but in the case of the military, the Department of Defense bears a proportion of this cost that is difficult to ascertain, and therefore public-sector employees have not been included.

for consolidation or merger. If the average cost of providing a particular service (adjusted for the 11 factors above) declines as city size increases, then this constitutes a *prima facie* argument for considering the possibility of consolidation or merger because cost economies exist.

- To estimate the efficiency of operations of each public service by each city. The estimating equation tells us what a particular city might be expected to spend per capita on a particular public service. If it is spending noticeably more than this, then perhaps it is not efficient in providing this service. If it is spending noticeably less than this, then perhaps it is efficient in providing this service. While such differentials certainly are not definitive, wide variations from the expected should prompt analysis of the quality of the services provided as well as the efficiency of the provision of those services.

With respect to city service provision efficiency, if the estimating equation described above predicts that a governmental unit might be expected to spend \$200 per capita annually on sanitation and waste removal, but actually it is spending \$250 per capita for that purpose, then this is a finding worthy of attention and analysis. It could be that it is simply inefficient in its provision of sanitation and waste removal. However, it also could be that this governmental unit has decided to offer perceptibly higher levels of quality for this service. Elements of both could be true.

The most important result generated by this analysis, however, relates to economies of scale. If larger cities serving more citizens are able to supply a service at noticeably lower cost than smaller cities, then an argument exists for considering the possibility of CMS for that service. On the other hand, if costs per capita increase as city size increases, then this is a service that apparently would not generate any cost savings if CMS occurred. The goal, via this estimating process, is to identify public services that are the most obvious candidates for merger/consolidation.

Once again, it is important to note that costs are not the only thing that should be considered when merger and consolidation discussions occur. Nevertheless, arguments for merging or consolidating the delivery of a public service are not likely to gain significant traction if no cost economies can be demonstrated.

LIST OF PUBLIC SERVICES EXAMINED

This study examines the provision of the following 25 public services:

- (1) General City Financial and Administrative Activities
- (2) Commonwealth's Attorney
- (3) Community Development
- (4) Corrections and Detention
- (5) Courts
- (6) Cultural Activities
- (7) Elections
- (8) Environmental Activities
- (9) Fire and Rescue
- (10) Public Health
- (11) Inspections
- (12) Law Enforcement and Traffic
- (13) Legislative and Governance
- (14) Maintenance of Buildings and Grounds
- (15) Maintenance of Roads, Bridges and Highways
- (16) Mental Health and Mental Retardation
- (17) Parks and Recreation
- (18) Public Library
- (19) Sanitation and Waste Removal
- (20) Welfare and Social Services
- (21) K-12 Educational Administration
- (22) K-12 Food Provision and Non-Instruction
- (23) K-12 Instruction
- (24) K-12 Operations and Maintenance
- (25) K-12 Pupil Transportation

EXAMPLE: GENERAL CITY FINANCIAL AND ADMINISTRATIVE ACTIVITIES

Graph 1 shows the estimated relationship between per capita expenditures on general financial and administrative activities in the 134 governmental units and the populations of those cities and counties – taking into account all of the factors noted above. **One can see that the 134 units enjoy reduced unit costs (they experience economies of scale) in their financial and administrative activities, as they grow larger – but only to a certain point. Beyond a certain point (roughly 630,000 population), estimated unit costs begin to rise.**⁴

Graph 1 and all of the graphs that follow are “best fit” relationships. They illustrate what the cost data tell us. County and city names have been inserted to provide context. This does not mean that a particular county or city actually resides precisely on the “best fit” line that characterizes all 134 counties and cities. In a succeeding section, we will illustrate how a specific city or county’s situation can be compared to the “best fit” situation.

In Virginia, the median (50th percentile) size of our 134 counties and cities is only 25,655. Therefore, Virginia has more than 65 county and independent city governing entities that are comparatively small. This is an important reason why conversations concerning the cost-saving potential of CMS have immediate relevance for us. The impressively large economies of scale illustrated in Graph 1 for financial and administrative tasks suggest that many of our smaller governmental units could save money if they consolidated or merged these services.

Some words of caution are appropriate at this point. The population of the city of Virginia Beach is 449,628. There is only one governmental unit (Fairfax County) that has a larger population; Fairfax County’s population was 1,116,897 in 2013. Hence, the estimates in Graph 1 between these two populations are extrapolations of what the relationship between costs and population looks like if that relationship is smooth and continuous. In any case, fully 132 of the 134 county/city observations involve populations smaller than Virginia Beach and we can have much greater confidence concerning the shape of the cost curve in that interval.

⁴ One must be very careful here, however, because there is only one governmental unit of this size in Virginia (Fairfax County). Hence, strong conclusions about rising unit costs beyond 630,000 population should be avoided.

If the cost relationship depicted in Graph 1 is accurate, then the optimal county/city size in terms of minimizing financial and administrative costs is about 630,000. This is the population that offers the lowest per capita financial and administrative costs. Note, however, that only Fairfax County, with more than 1.1 million residents, is larger than Virginia Beach’s 449,628 citizens, so caution is called for with respect to the shape of the cost curve beyond 449,628 population.

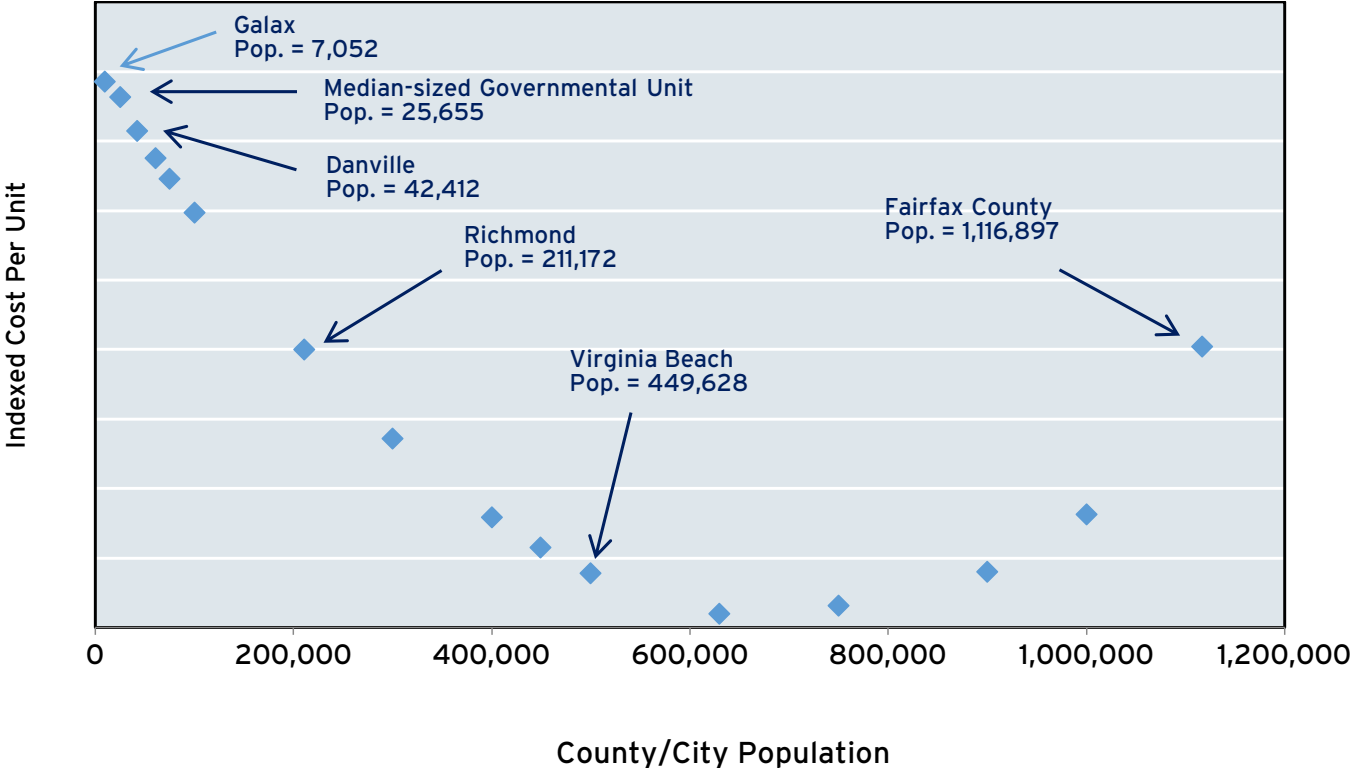
The apparent cost implications of Graph 1, however, cannot be missed – significant economies of scale exist in the provision of general financial and administrative services for at least 132 of Virginia’s 134 counties and cities. Finance and administration is a service that appears to be ripe for CMS discussions. Graph 1 informs us that there is money to be saved by means of CMS where finance and administration are concerned. The logical place for counties and cities to start such discussions is with adjacent governmental units. Nevertheless, some of the available economies of scale potentially could be generated by non-adjacent counties and cities if, for example, they were to engage in joint purchases of items ranging from paper to automobiles, utilize common software licenses, and share affirmative action officers and retraining of specialists, etc.

The financial stakes are large. In 2013, according to the Auditor of Public Accounts, the 134 counties and cities spent \$1.008 billion on general financial and administrative activities. If these governmental units were able to save only 5 percent of this amount (\$50 million) by means of CMS, this would be worth \$6 annually to every Virginian. Note that there are 24 other public service CMS possibilities that have the potential to add to this saving.

Some Virginians may feel that the Commonwealth maintains too many local governmental units because of our complicated system of independent cities, towns and counties. However, we have only 6.1 governmental units per 1,000 citizens – a paltry number when compared to North Dakota’s 389.9 governmental units per 1,000 citizens, or even neighboring North Carolina’s 10. www.governing.com/gov-data/number-of-governments-by-state.html

GRAPH 1

**THE PER CAPITA COST CURVE FOR GENERAL FINANCIAL AND ADMINISTRATIVE SERVICES
RELATIVE TO POPULATION IN 134 VIRGINIA COUNTIES AND CITIES, 2013**



Source: Center for Economic Analysis and Policy, Old Dominion University

EXAMPLE: MAINTENANCE OF ROADS, BRIDGES AND HIGHWAYS

“Everybody has to do it,” commented one elected official. She was referring to the need for government to maintain public roads, bridges and highways. Yes, this need includes filling ubiquitous road potholes, cutting grass, removing trash and other necessary, but unglamorous, tasks.

In contrast to financial and administrative tasks, mild diseconomies of scale exist for most Virginia governmental units with respect to the maintenance of their roads, bridges and highways. Graph 2 reveals that per capita costs rise gradually as city and county populations grow until governmental units serve about 250,000 people. After that, these per capita costs begin to recede. Fairfax County, with a population of 1,116,897, potentially enjoys substantial economies of scale. However, it is the only observation involving a population of this size so caution should be exercised concerning the shape of this cost curve beyond the size of Virginia Beach (449,628).

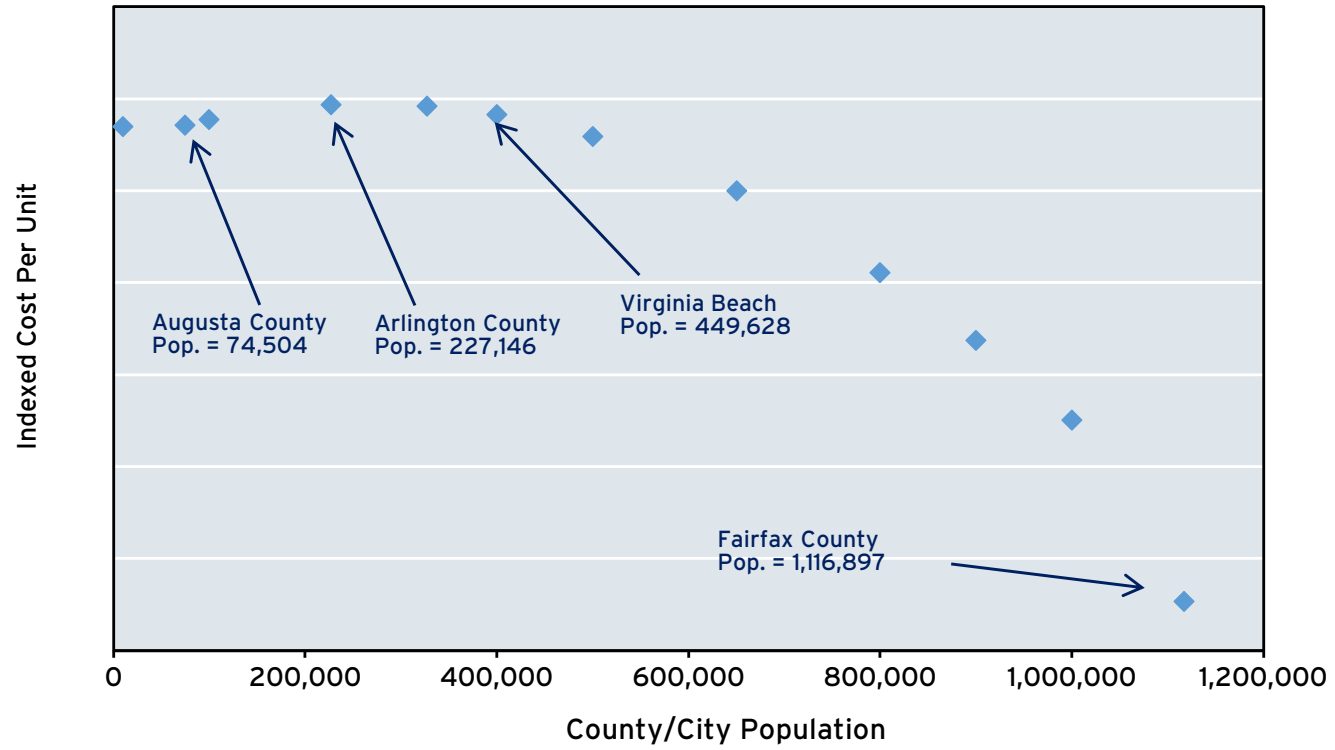
In addition to Fairfax County, only six other jurisdictions (Arlington County, Chesterfield County, Henrico County, Loudoun County, Prince William County and the city of Virginia Beach) are large enough to be able to experience available economies of scale on their own. There are, however, many medium-sized cities (Alexandria, Chesapeake, Hampton, Newport News, Norfolk, Richmond and Roanoke) and medium-sized counties (Spotsylvania and Stafford) that presumptively could lower their road, bridge and highway maintenance costs by CMS.

On the other hand, the maintenance data suggest that there is relatively little to be gained cost-wise by pursuing CMS in the Commonwealth’s smaller governmental units.



GRAPH 2

**THE PER CAPITA COST CURVE FOR MAINTENANCE OF ROADS, BRIDGES AND HIGHWAYS
RELATIVE TO POPULATION IN 134 VIRGINIA COUNTIES AND CITIES, 2013**



Source: Center for Economic Analysis and Policy, Old Dominion University

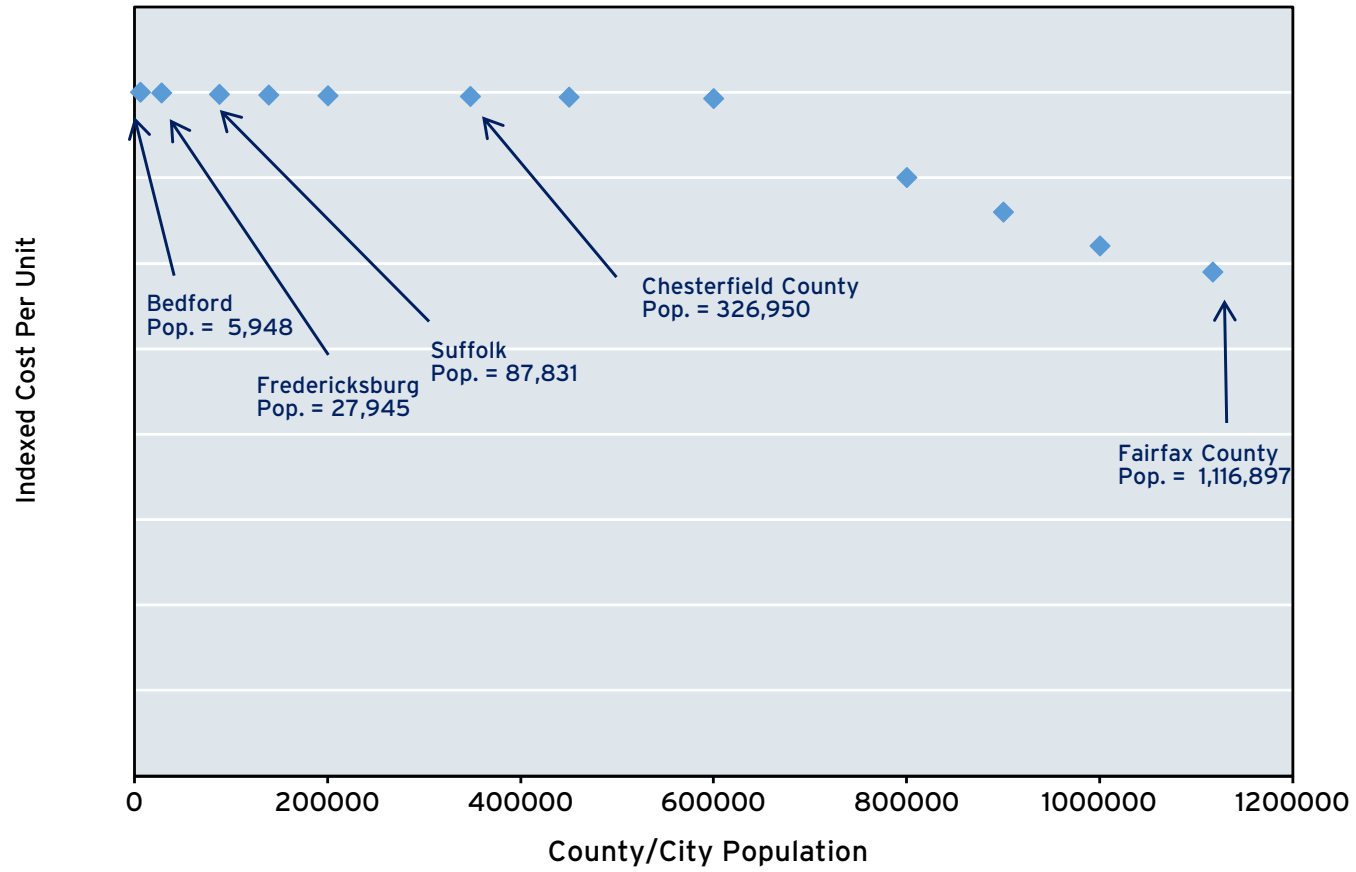
EXAMPLE: PARKS AND RECREATION

All but five of Virginia’s 134 counties and cities reported cost information to the Auditor of Public Accounts concerning their expenditures on some type of parks and recreation system. Graph 3 discloses that “constant returns to scale” (level per capita costs as population increases) characterize parks and recreation activities until a county or city becomes very large. In our sample, only the city of Virginia Beach and Fairfax County are of such size that enables them to benefit from economies of scale in their parks and recreation activities. This is not true for a clear majority of the Commonwealth’s counties and cities. Hence, CMS would not appear to be a pressing concern where parks and recreation programs are concerned.



GRAPH 3

THE PER CAPITA COST CURVE FOR PARKS AND RECREATION RELATIVE TO POPULATION IN 134 VIRGINIA COUNTIES AND CITIES, 2013



Source: Center for Economic Analysis and Policy, Old Dominion University

COMPARING COUNTIES AND CITIES TO OUR PREDICTIONS

Let's now illustrate where several counties and cities actually are compared to the "best fit" line that reflects our best estimate of the overall relationship and cost tendencies for the 134 counties and cities. In essence, we are asking, "How does this city/county compare to the way the typical city/county does things?"

We will use general financial and administrative expenditures as our example. However, the same techniques can be utilized to generate specific information for any of the 25 public services in any of the 134 counties and cities.

Using the statistical relationship we developed to generate the "best fit" line for financial and administrative expenditures, let's now insert specific values for each explanatory variable into our "best fit" equation for the cities of Lynchburg and Winchester, and Northampton County.

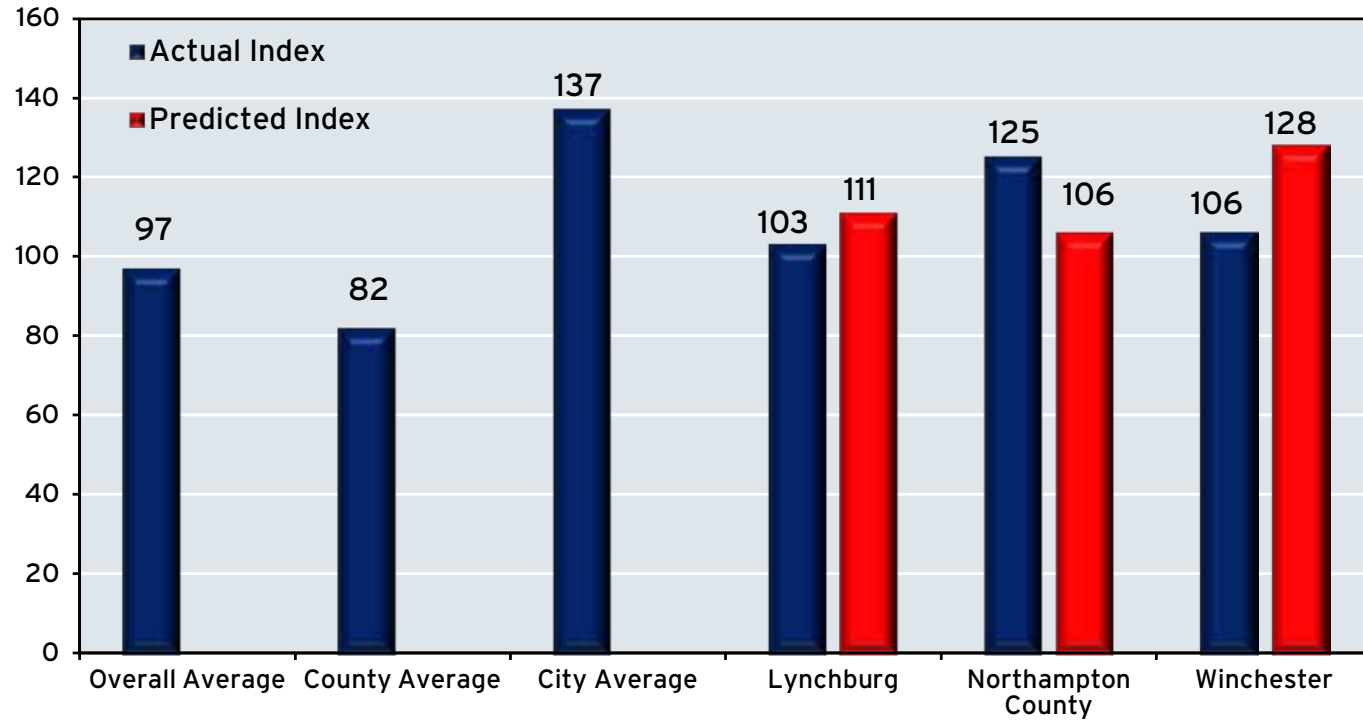
Our predicted index value for all three governmental units, based on their expenditures on financial and administrative activities, assumes they react and behave like the typical Virginia county/city with respect to the 11 influences in our model – population, poverty rate, fiscal stress, etc. Thus, our model tells us that if Lynchburg were "typical," it would have a financial and administrative cost index of 111. In fact, Graph 4 shows Lynchburg's index is only 103.

There are four possible explanations for this disparity. First, the city of Lynchburg simply may be more cost conscious and efficient in its operations than other counties and cities and thus able to get along with fewer administrators and workers. Second, Lynchburg may be offering financial and administrative services of lower quality and/or not offering as much as the typical county or city. Third, our model may not contain explanatory variables that are critical to Lynchburg's situation. Fourth, we could be observing a one-year aberration that will not reoccur in future years. For example, adverse weather and financial events can force counties and cities to reallocate funds to meet unusual circumstances.

We don't know which of these explanations (or perhaps a combination of them) applies in the case of Lynchburg. Nor can we immediately explain why Winchester also "beats" our cost prediction, while Northampton County does the opposite. Those cities and county, however, ought to be interested in discovering why. Indeed, this model can generate similar estimates for all of the 25 public services being examined. **Whether or not counties or cities choose to pursue CMS, they should be interested in examining why their jurisdiction performs better or worse than the typical Virginia governmental unit in the provision of public services. This model provides counties and cities with a means to audit the efficiency of their operations.**

GRAPH 4

ACTUAL VS. PREDICTED EXPENDITURE INDEXES FOR FINANCIAL AND ADMINISTRATIVE ACTIVITIES FOR LYNCHBURG, NORTHAMPTON COUNTY AND WINCHESTER



Source: Center for Economic Analysis and Policy, Old Dominion University

Summing Up Our Findings

We have examined the costs that 95 counties and 39 cities incurred in 2013 as they provided 25 public services to their citizens. The most vital information in that regard is whether economies of scale exist in their provision of a specific service such that consolidating or merging the provision of that service would result in lower per capita costs. With this in mind, we can summarize our findings as follows:

Economies of Scale Exist: CMS Discussions Are Merited

Legislative and City Council Activities
 Financial and Administrative Activities
 Elections
 Commonwealth's Attorney
 Courts
 Public Libraries
 Law Enforcement and Traffic
 Inspections
 Sanitation and Waste Removal
 Maintenance of Buildings and Grounds
 Welfare and Social Programs
 K-12 Instruction
 K-12 Administration

Modest Economies of Scale Exist or Evidence Is Mixed: CMS Possibilities Limited

Parks and Recreation
 Environmental Programs
 Health
 K-12 Food and Non-Instructional Activities

Constant Costs Exist: CMS Discussions Probably Not Merited

Corrections and Detention
 Mental Health and Retardation

Diseconomies of Scale Exist: CMS Discussions Not Merited, Though Larger Governmental Units Perhaps Might Investigate Decentralization

Cultural Activities
 Community Development
 Maintenance of Roads, Bridges and Highways
 Fire and Rescue
 K-12 Operations and Maintenance
 K-12 Pupil Transportation

The evidence presented here plants a new flag: Never before has anyone made a rigorous attempt to estimate cost functions for each of the 25 major public services that Virginia's counties and cities provide. This evidence certainly does not constitute the last word on these matters, but does provide thought-provoking information to which prudent county and city leaders should give attention.⁵

Joint service provision by several governmental units already exists in important areas such as public transportation, water supply, and sanitation and waste removal. There now is ample reason to explore the expansion of this list.

⁵ Old Dominion University's Center for Economic Analysis and Public Policy has the ability to analyze the cost circumstances of any particular city or county, or any related collection of cities and counties.

