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**COST SAVINGS FROM CONSOLIDATING  
NORTH DAKOTA'S COUNTIES**

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# COST SAVINGS FROM CONSOLIDATING NORTH DAKOTA'S COUNTIES

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## **Abstract**

Consolidation of county government services is often proposed as a way to reduce costs. A bill was proposed in the 1993 North Dakota Legislative Assembly to merge North Dakota's 53 counties into 15 "super counties." This study estimates county expenditure functions for four categories of services: (1) general government, (2) public safety, (3) roads and highways, and (4) health and welfare. The statistical results were used to estimate expenditures for the 15 consolidated counties and a 26-county alternative. The results indicate that the 15-county proposal would have achieved cost savings of 4.9 percent for the four service categories. Costs of road and highway, general government, and health and welfare services could be reduced 3, 10, and 15 percent, respectively, under the 15-county proposal, but public safety expenditures would increase 25 percent. The 26-county alternative would provide less total cost savings, but also fewer cases of cost increases. Consolidation of some, but not all, county government services provides the greatest cost savings.

**Key Words:** Consolidation, County Government, Economies of Size, Nonlinear Regression, Population

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## Abstract

Consolidation of county government services is often proposed as a way to reduce costs. A bill was proposed in the 1993 North Dakota Legislative Assembly to merge North Dakota's 53 counties into 15 "super counties." This study estimates county expenditure functions for four categories of services: (1) general government, (2) public safety, (3) roads and highways, and (4) health and welfare. The statistical results were used to estimate expenditures for the 15 consolidated counties and a 26-county alternative. The results indicate that the 15-county proposal would have achieved cost savings of 4.9 percent for the four service categories. Costs of road and highway, general government, and health and welfare services could be reduced 3, 10, and 15 percent, respectively, under the 15-county proposal, but public safety expenditures would increase 25 percent. The 26-county alternative would provide less total cost savings, but also fewer cases of cost increases. Consolidation of some, but not all, county government services provides the greatest cost savings.

**Key Words:** Consolidation, County Government, Economies of Size, Nonlinear Regression, Population

## Highlights

Consolidation of county government services has often been proposed as a way to reduce the cost to taxpayers. In 1993, North Dakota State Senator Jay Lindgren proposed merging North Dakota's 53 counties into 15 "super counties." He estimated that \$3.9 million would be saved from salaries alone. The super-county proposal was defeated, but consolidation of specific county government services continues in North Dakota.

This study estimates to what extent consolidation of county government services in North Dakota would reduce expenditures and thereby reduce the burden on taxpayers. Four major categories of county government services were evaluated: (1) general government, (2) public safety, (3) roads and highways, and (4) health and welfare. Based on 1983-92 data, county expenditures were statistically estimated as a function of population, average wage, a travel-cost variable, year, oil extraction, and coal extraction. The travel-cost variable equals the total miles of streets, roads, and highways in each county multiplied by the average gasoline price for North Dakota. The statistical results were used to estimate expenditures for the 15 consolidated super counties and an intermediate, 26-county alternative created by the author for comparison.

The results indicated that the 15-county proposal would have achieved cost savings of 4.9 percent, or about \$12 million in 1992 dollars, for the four categories of county government services. However, the cost of public safety services would have increased in each of the 15 super-county districts 25 percent for the state. Cost savings for road and highway services in eastern and southwestern North Dakota would be largely offset by cost increases in northwestern North Dakota, resulting in only a 3.5 percent cost reduction for county-level road and highway services in the state. The results suggest that consolidation of general government and health and welfare services would have achieved substantial cost savings of 10 percent and 15 percent, respectively. The 26-county alternative would achieve savings of approximately 3 percent for the four categories of service. Public safety expenditures would be about 11 percent higher than for 53 counties.

The results suggest that consolidating of counties is not the answer for reducing the costs of county government services in North Dakota. Substantial cost savings could be achieved for some services, in some regions of North Dakota, but not for other services and regions. Furthermore, this analysis does not consider the adjustment costs of consolidating counties. The cost estimates also does not consider the lower quality of services, reduced local control over services, and effects of lost jobs and local business in current county seats that would result from consolidation. Consolidation should be undertaken only for specific services after careful study of probable cost savings, adjustment costs, and reduced quality of services.

## **COST SAVINGS FROM CONSOLIDATING NORTH DAKOTA'S COUNTIES**

**Mark A. Krause\***

### **Introduction**

Declining populations, taxable incomes, and property values, combined with declining state government contributions, have made it difficult for many rural counties in North Dakota to maintain traditional county government services. Increasing tax rates to maintain levels of county government services is generally not a politically viable option. Consolidation of counties or of individual services provided by county governments has been proposed to reduce costs. In 1993, the North Dakota State Legislature debated a bill that would have consolidated North Dakota's 53 counties into 15 "super-counties." The bill's sponsor, Jay Lindgren, claimed that it would eliminate the jobs of about 400 county officeholders and save \$3.9 million in salaries alone (Wetzel, 1993). However, his estimate and the subsequent debate appeared to be based more on speculation than on economic analysis. This study presents statistical analysis and estimated cost savings for four categories of county government services in North Dakota under the 15-county proposal and a 26-county alternative compared to costs for the current 53 counties (Figure 1). The statistical method is described and could easily be used to evaluate whether consolidation could reduce costs of providing local government services in other states.

Figure 1. Proposed Multicounty Districts in North Dakota

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The challenges of maintaining local government services while per capita tax revenues and fiscal aid from federal and state governments are declining have been reported throughout the United States (Dimeo, 1991; Boroughs, Black, and Collins, 1991; Hinds, 1991; Johnson et al., 1995; Rubin, 1996). Local governments began reporting budget deficits in 1986 (Rubin), which became increasingly severe by 1991 and 1992. In 1991, the director of research for the National Association of Counties stated, "Nearly all of the nation's 425 counties with populations over 100,000 are also looking to reduce services or raise taxes or both" (Hinds, 1991). Three quarters of these large counties have a legal cap on the property taxes they can raise, and 78 percent of them had reached this limit by 1991 (Boroughs, Black, and Collins, 1991). However, fiscal burden, as defined by Johnson et al. (1995), has been even higher in non-metropolitan counties, particularly in the West and Great Plains regions of the United States.

It has been argued since the 1930s that the county governments established in the 19th century in the Great Plains are smaller than needed to provide high-quality services and smaller than the most cost-efficient size. Complete elimination of some local government units in sparsely settled regions of the Great Plains was advocated by a Great Plains Committee report published in 1936 (Rose, 1971). The same report argued that county boundaries that were determined by the distance a horse could travel in a day are inappropriate when more modern means of transportation are available and that substantial reductions in fiscal burdens could be obtained through consolidation.

One important obstacle to consolidation of local government units has been a lack of clear empirical documentation of economies of size for local government services. Fox (1980) discusses the difficulties in measuring costs, input usage, input prices, technology, and output when estimating cost functions for government services. Another difficulty is separating the effects of demand changes on expenditures from the effects of supply-side production costs. Most of these difficulties have been assumed away in the empirical studies. Furthermore, most empirical studies have pre-determined the functional form of the cost function. Largely as a result of the different model specifications and measurement problems in the data, empirical studies of economies of size in local government services have produced mixed results (Fox, 1980).

Anecdotal evidence for achieving economies of size through local government consolidation also has been mixed. Consolidation of city with county government services appears to have achieved cost savings in Lexington-Fayette County, Kentucky; Indianapolis-Marion County, Indiana; and St. Louis-St. Louis County, Missouri (Ward, 1992); but has not achieved cost savings in Athens-Clarke County, Georgia (Condrey, 1994). An *ex ante* analysis by Bunch and Strauss (1992) indicates that seven of nine municipalities in western Pennsylvania would reduce their per capita revenue burdens after consolidation. Bunch and Strauss also suggest that local governments with relatively low overhead costs and relatively low wages and fringe benefits are most likely to increase costs after consolidation, largely due to equalization of wages and taxes with relatively free-spending neighbors.

Consolidation of local government units also has been slowed by concerns over access to services, local control over the quality of service, loss of community identity, and the economic impact of lost jobs (Thompson, 1992; Ward, 1992; Lemov, 1993; Mahtesian, 1995). Most consolidation of services has been small scale because consolidation of major services is politically controversial (Lemov, 1993; Mahtesian, 1995). Efficiency is not the only economic goal in the provision of local government services. Estimated economies of size must therefore be large enough to offset negative impacts on equitable access to services, local control, and the preservation of rural communities before consolidation will be politically popular.

Consolidation of counties also would result in substantial adjustment costs, including moving expenses and the expansion of existing courthouses or building of new ones. The Logan County auditor, Blanche Schumacher, suggested that the cost of building a new district courthouse in Wishek, North Dakota, would far outweigh any cost savings due to economies of size (Reiger, 1993). The long-term cost savings would need to be substantial for the present value of consolidation benefits to exceed the present value of the adjustment costs.

### **Methodology**

This study estimates economies of size for four categories of county government services: general government, public safety, health and welfare, and road and highway. The categories are defined by the North Dakota State Auditor's office, from which the expenditure data were obtained. General government expenditures include those for the County Board, County Auditor, County Treasurer, States Attorney, County Court, Register of Deeds, plus general supplies, utilities, and maintenance. Public safety expenditures include those for the Sheriff's office, County Jail, and Civil Defense. Health and Welfare expenditures include those for Social Services/Welfare, County Poor, Veterans Service, Social Security, County Health Unit, Board of Health, senior citizen programs, and mental health programs. Highway and Road expenditures include County Road and Bridge expenditures, Farm to Market Road expenditures, and expenditures from the North Dakota Highway Tax Distribution Fund. The data cover 1983-92 for most of the counties, for a total of 506 observations.

Total annual expenditures for each category are estimated as a function of population, average wage, a transportation cost variable, a time trend, oil extraction, and coal extraction. Population is the primary variable of interest because this study focuses on the relationship between per capita costs and population. The average wage and transportation cost variables are included to capture the influence of higher wages and the costs of traveling greater distances in some counties and some years than in others. The year is included to account for policy, economic, and technology trends. Oil and coal extraction effects are included because they provide North Dakota counties with large extraction tax revenues, which encourage spending and increase demands for county government services.

Fox (1980) and Deller, Chicoine, and Walser (1988) have criticized models which combine supply and demand variables and use expenditures as a dependent variable. However, the data required for this model are relatively easy to obtain, so the model could be estimated for other states with less time and expense than the models advocated by Fox and Deller, Chicoine, and Walser.

The average county wage data were taken from the REIS data set (Bureau of Economic Analysis, Department of Commerce). The transportation cost variable equaled the product of total street, road, and highway miles in the county (Bangsund and Leitch, 1990) multiplied by the state average gasoline price (Energy Information Administration, various years). Oil and coal extraction data were obtained from the North Dakota tax commissioner. All monetary data were converted to 1992 dollars using the Consumer Price Index.

A Box-Cox non-linear transformation of the data was used to avoid imposing a particular functional form on the expenditure relationships. The Box-Cox estimates were obtained using the LIMDEP econometrics software package (Greene, 1992). Separate transformation parameters for the dependent and independent variables were estimated. Oil and coal extraction were included as linear effects and were not transformed, due to the many zero observations for which the Box-Cox transformation is not defined. The standard deviation of the residuals was calculated from the predicted expenditure values.

Predicted expenditures were calculated for North Dakota's 53 counties, the 15 proposed super counties, and a 26-county alternative. Consolidated county definitions and populations are presented in Tables 1 and 2. The 26-county alternative was created to provide cost-savings estimates for an intermediate level of consolidation. The criteria used to create the alternative 26 consolidated counties were a combined population of at least 10,000 (three exceptions were allowed) and local trade centers included in as many consolidated counties as possible. Local trade centers were identified by Bangsund et al. (1991).

The predicted expenditure values for 1992, or the most recent year for which data were available, provided the baseline for the estimation of cost-savings from consolidation. Population, travel cost, oil extraction, and coal extraction data were summed for each of the consolidated counties. The average wage for each consolidated county was calculated as an average, weighted by county population, of the county average wage data. Predicted expenditure values were then calculated for the consolidated counties, based on the estimated Box-Cox parameters. Finally, the predicted expenditures were summed and compared for North Dakota's current 53 counties, the 15 proposed super-counties, and the 26-county alternative.

Table 1. Populations in 1992 for the 15 Super-county Districts

District	Counties	Combined Population
1	Divide, Williams, Burke, Mountrail	32,928
2	Ward, Renville, McHenry, Bottineau	74,287
3	Rolette, Pierce, Benson, Towner, Ramsey	40,528
4	Cavalier, Pembina, Walsh	27,844
5	Grand Forks, Nelson	75,027
6	Cass, Traill	115,121
7	Griggs, Steele, Barnes	17,647
8	Richland, Ransom, Sargent	28,023
9	Emmons, Logan, McIntosh, LaMoure, Dickey	22,241
10	Eddy, Foster, Stutsman, Wells	34,021
11	Burleigh, Kidder, Sheridan	67,693
12	Dunn, Mercer, McLean, Oliver	25,484
13	Grant, Morton, Sioux	30,794
14	Adams, Bowman, Hettinger, Slope, Stark	33,277
15	Billings, Golden Valley, McKenzie	9,116

Table 2. Populations in 1992 for 26 Consolidated Counties

	Counties	Combined Population
1.	Divide, Williams	23,475
2.	Burke, Mountrail	9,453
3.	Renville, Ward	60,466
4.	Bottineau, McHenry	13,821
5.	Rolette, Towner	16,416
6.	Pierce, Benson	11,649
7.	Ramsey, Nelson	16,641
8.	Cavalier, Pembina	14,653
9.	Walsh	13,191
10.	Grand Forks	70,849
11.	Griggs, Steele, Traill	14,004
12.	Barnes	12,205
13.	Cass	106,559
14.	Ransom, Sargent	10,181
15.	Richland	17,842
16.	LaMoure, Dickey	11,113
17.	Emmons, Logan, McIntosh	11,128
18.	Eddy, Foster	6,638
19.	Stutsman	21,838
20.	Sheridan, Wells	7,590
21.	Burleigh, Kidder	65,648
22.	McLean, Mercer, Oliver	21,600
23.	Morton, Grant, Sioux	30,794
24.	Slope, Hettinger, Bowman, Adams	10,468
25.	Dunn, Stark	26,693
26.	Golden Valley, Billings, McKenzie	9,116

Readers who wish to apply this method to other cases should note that the predicted values are calculated as non-linear functions of the estimated Box-Cox parameters. The formula for calculating the predicted expenditure values is

$$(1) \quad Exp = [(\theta\alpha + 1) + \theta\beta_1 \frac{P^\lambda - 1}{\lambda} + \theta\beta_2 \frac{W^\lambda - 1}{\lambda} + \theta\beta_3 \frac{T^\lambda - 1}{\lambda} + \theta\beta_4 \frac{Y^\lambda - 1}{\lambda} + \theta\beta_5 O + \theta\beta_6 C]^{-\theta},$$

where  $Exp$  is the predicted expenditure,  $\theta$  is the estimated theta parameter,  $\lambda$  is the estimated lambda parameter,  $\alpha$  is the estimated constant,  $P$  is population,  $W$  is average wage,  $T$  is transportation cost,  $Y$  is year,  $O$  is oil extraction,  $C$  is coal extraction, and  $\beta_1$  through  $\beta_6$  are the estimated parameters for population, wage, transportation cost, year, oil extraction, and coal extraction, respectively. The calculations can easily be in a computer spreadsheet.

## Statistical Results

Population has the expected positive and highly significant influence on total costs for all four service categories (Table 3). The year has a statistically significant, positive influence on total costs for every category except roads and highways, for which it has a statistically significant, negative influence. Oil and coal extraction have a highly significant, positive influence on every service category except health and welfare. Oil and coal extraction have a statistically significant, negative effect on health and welfare expenditures, probably reflecting less demand for social services in times of economic expansion. Similarly, wages have a positive effect on total costs for general government and public safety, but a negative influence on health and welfare expenditures, although none of these effects are statistically significant. The transportation cost variable has a statistically significant, positive influence on county road and highway expenditures.

The coefficients of determination, or  $R^2$  coefficients in Table 3, suggest that most of the variance in expenditures is explained by the models. The  $R^2$  coefficients range from 0.652 for road and highway expenditures to 0.943 for health and welfare expenditures. However, the  $R^2$  coefficients are inflated by the large number of observations and exaggerate the predictive power of the model. A better indication of the model's predictive power can be obtained by comparing the standard deviation of the residuals to the mean expenditures (Table 3). The standard deviation of residuals for general government and health and welfare are around 30 percent of their mean values, but the standard deviation of residuals for the other two categories are around 53 percent of their mean values. This comparison suggests that many other variables influence expenditure levels than have been included in the statistical model.

When all variables except population are held constant at their means, estimated per capita costs show large economies of size throughout the range of North Dakota county populations for general government (Figure 2) and road and highway services (Figure 3). Estimated per capita costs for general government services are 2.2 times as high for a population of 5,000 as for a population of 25,000. Estimated per capita costs for road and highway services are 2.6 times as high for a population of 5,000 as for a population of 25,000. Consolidation of at least some

general government and road and highway services would therefore be expected to result in substantial per capita cost savings.

Estimated costs for road and highway services per mile of streets, roads, and highways also decline with additional miles over the range observed in North Dakota counties. Doubling the miles from the average of 2,157, while holding population constant at the mean, reduces estimated road and highway expenditures 41 percent, which is consistent with the approximately 50 percent reduction for rural townships estimated by Deller, Chicoine, and Walzer (1988), Deller and Nelson (1991), and Deller and Halstead (1994).

Table 3. Box-Cox Estimates of Total Expenditure Parameters<sup>1</sup>

Independent Variable	General Government	Public Safety	Health & Welfare	Roads & Highways
Constant	15.78 (3.44)	16.67 (3.50)	43.02 (3.98)	-12.53 (1.19)
Population	0.522 (3.42)	0.940 (6.04)	2.863 (5.10)	0.531 (2.70)
Wage	0.302 (2.69)	0.976 (5.09)	0.770 (2.32)	0.227 (1.25)
Transportation Cost	0.184 (3.39)	0.250 (3.90)	-0.035 (0.26)	0.227 (2.59)
Year	1.252 (2.75)	8.785 (3.04)	18.045 (3.23)	-12.530 (1.19)
Oil	0.726E-3 (2.90)	0.177E-2 (4.91)	-0.147E-2 (3.34)	0.733E-2 (2.82)
Coal	0.116E-4 (0.86)	0.256E-4 (1.04)	-0.136E-3 (2.76)	0.204E-3 (2.48)
Lambda <sup>2</sup>	0.195 (4.79)	0.224 (6.02)	0.124 (3.90)	0.395 (5.80)
Theta <sup>3</sup>	0.070 (1.45)	0.120 (3.82)	0.230 (6.31)	0.180 (3.88)
R <sup>2</sup>	0.871	0.873	0.943	0.652
Mean	860.3	380.6	728.2	1,374.0
Standard Deviation of Residuals	274.9	203.5	210.6	720.9

<sup>1</sup>The variables in parentheses are t-statistics. (All data were divided by 1,000).

<sup>2</sup>Lambda was used to transform the dependent variables.

<sup>3</sup>Theta was used to transform the dependent variables.

Figure 2. General Government Expenditures Per Capita in North Dakota Counties

Figure 3. Road and Highway Expenditures Per Capita in North Dakota Counties

Estimated per capita costs show small economies of size for health and welfare services (Figure 4) and small diseconomies of size beyond a population of 70,000 for public safety services (Figure 5). The ratios of estimated per capita costs for a population of 5,000 to those for a

population of 25,000 are only 1.4 for public safety and 1.3 for health and human services. Since access to health, welfare, and public safety services is vital for many people, it is doubtful whether the potential cost savings from consolidating the units providing these services would offset the economic costs of reduced access.

However, transportation costs increase as counties are consolidated, so increasing populations by combining counties may increase the costs of government services rather than reduce them. In addition, because the relationships are nonlinear, dividing one county's oil or coal extraction evenly among it and three other counties that have no extraction often results in substantially higher (or lower in the case of health and welfare) estimated costs for the combined four counties than the sum of estimated costs in the four separate counties. As counties are consolidated, the effects of transportation costs and summation of nonlinear relationships sometimes increase per capita costs more than the increased population reduces per capita costs.

Figure 4. Health and Welfare Expenditures Per Capita in North Dakota Counties

Figure 5. Public Safety Expenditures Per Capita in North Dakota Counties

### **Cost Reduction Estimates**

Estimates of total expenditures in North Dakota for the four categories of county government services are 2.5 percent lower under the 15-county proposal than for the current 53 counties. The reduction is equivalent to about \$4 million in 1992. Assuming that the real social discount rate is 5 percent (adjusted for inflation) and that the \$2 million cost savings increase at the inflation rate, the present value of cost savings from the 15-county consolidation will be positive if the initial adjustment costs are less than \$80 million.

However, costs for public safety services are estimated to increase in each of the 15 super-county districts and costs for other service categories increase in five of the super-county districts (Table 4). Cost increases for public safety in the super-county districts range from 6 percent to 130 percent. General government costs range from 33 percent lower to 21 percent higher than before consolidation in the 15 super-county districts. Health and welfare costs range from 50 percent lower to 2 percent higher than before consolidation. Road and highway costs range from 42 percent lower to 54 percent higher than before consolidation. For the entire state, general government costs are reduced 8.3 percent, public safety costs increase 34.9 percent, health and welfare costs decline 14.1 percent, and road and highway costs decline 2.4 percent under the 15-county proposal.

Table 4. Estimated Percent Cost Savings for 15-County Proposal

Super County District	Counties	General Government	Public Safety	Health & Welfare	Roads & Highways
1	Divide, William, Burke, Mandrel	7.5	-43.5	23.3	-4.9
2	Ward, Renville, McHenry, Bottineau	-21.3	130.0	6.7	-11.2
3	Rolette, Pierce, Benson, Towner, Ramsey	2.2	-71.0	-2.3	14.8
4	Cavalier, Pembina, Walsh	21.2	-12.0	19.8	27.5
5	Grand Forks, Nelson	0.0	-12.0	3.3	7.8
6	Cass, Traill	2.4	-8.6	7.6	4.5
7	Griggs, Steele, Barnes	22.9	-5.9	14.0	32.0
8	Richland, Ransom, Sargent	21.4	-7.1	18.0	28.7
9	Emmons, Logan, McIntosh, LaMoure, Dickey	32.9	-19.2	42.3	23.6
10	Eddy, Foster, Stutsman, Wells	22.4	-13.7	18.9	31.8
11	Burleigh, Kidder, Sheridan	2.7	-18.0	7.7	11.2
12	Dunn, Mercer, McLean, Oliver	9.6	-45.4	49.7	-54.3
13	Grant, Morton, Sioux	14.3	-15.3	11.4	26.2
14	Adams, Bowman, Hettinger, Slope, Stark	19.1	-31.8	22.3	20.0
15	Billings, Golden Valley, McKenzie	4.9	-54.5	27.9	-50.8

Regional differences in the benefits and costs of consolidation are apparent. Public safety costs increase the most in northwestern and north-central North Dakota (super-county districts 1, 2, 3, 12, and 15) under the 15-county proposal. Each of these super-county districts except district 3 combine counties with widely different average salaries. Each of these super-county districts except district 15 also have relatively high transportation costs. Road and highway costs only increase in northwestern North Dakota (super-county districts 1, 2, 12, and 15). Again, each of these super-county districts combine counties with a wide range of average salaries. The least cost savings for general government services occur when the most populated counties (Cass, Grand Forks, Burleigh, and Ward) are combined with lightly populated counties. Health and welfare cost savings are greatest where counties with large amounts of oil and coal extraction are combined with counties that have little or no extraction.

Total cost savings are slightly greater for the 26-county alternative than for the 15-county proposal (Table 5). Estimated expenditures in North Dakota for the four categories of services are 3.2 percent lower for the 26-county alternative than for the current 53 counties. This reduction is equivalent to about \$5 million in 1992. Although consolidation increases estimated public safety costs in all but one case, the 26-county alternative reduces general government and health and welfare expenditures in every case. Road and highway expenditures are increased by consolidation in only three cases. Cost savings relative to the current 53 counties (excluding cases of no consolidation) range from 1.2 percent to 31 percent for general government and from 2.8 percent to 44 percent for health and welfare services. Changes in costs for public safety range from a 0.8 percent reduction to a 55 percent increase. Changes in road and highway costs range from a 36 percent reduction to a 51 percent increase. For the entire state, general government costs are reduced 7.0 percent, public safety costs increase 10.6 percent, health and welfare costs decline 6.8 percent, and road and highway costs decline 2.2 percent under the 26-county proposal.

## Discussion

The cost savings estimates strongly suggest that selective consolidation of some county government services in some regions will reduce costs more than large-scale consolidation of all services throughout the state. In particular, it appears that consolidating the public safety services of one or more adjacent counties would generally increase rather than reduce costs. It appears that a moderate amount (e.g., the 26-county alternative) of consolidating general government and health and welfare services in adjacent counties would provide positive cost savings throughout the state. Consolidation of road and highway services in one or more adjacent counties also appears to provide cost savings in all but northwestern North Dakota.

An important implication is that at least the county sheriff's office (generally the largest public safety item) should be kept in all of the counties. Consolidation of public safety offices appears to increase costs and reduces the quality of public safety services. Quality of public safety services is largely based on the quickness of response to threats and emergencies, the prevention of problems through education and frequent patrols, and responsiveness to community preferences regarding how services are provided. These quality factors would be reduced for the residents who are located further away from consolidated public safety offices than from the current county seats.

Since there is a strong economic argument for keeping public safety services in the current county seats, the other categories of service should be examined in greater detail to see whether other services should continue to be provided in the county seats. Quickness of response is also important for snow removal (a major road and highway activity) and some health and welfare services. Access and local control over the quality of services are important for many general government (e.g., county clerk) and health and welfare services.

Table 5. Estimated Percent Cost Savings for 26-County Alternative

	Counties	General Government	Public Safety	Health & Welfare	Roads & Highways
1.	Divide, Williams	4.8	-14.3	8.5	-0.9
2.	Burke, Mountrail	3.6	-16.1	2.8	-14.3
3.	Renville, Ward	1.2	-12.0	5.9	0.3
4.	Bottineau, McHenry	10.3	-15.6	6.8	17.4
5.	Rolette, Towner	13.3	-7.4	9.4	20.7
6.	Pierce, Benson	17.9	-3.3	11.1	24.1
7.	Ramsey, Nelson	12.4	-9.7	7.0	22.3
8.	Cavalier, Pembina	16.0	-5.1	11.9	21.8
9.	Walsh	n/a	n/a	n/a	n/a
10.	Grand Forks	n/a	n/a	n/a	n/a
11.	Griggs, Steele, Traill	25.6	-5.0	14.7	35.2
12.	Barnes	n/a	n/a	n/a	n/a
13.	Cass	n/a	n/a	n/a	n/a
14.	Ransom, Sargent	19.4	0.8	11.4	26.4
15.	Richland	n/a	n/a	n/a	n/a
16.	LaMoure, Dickey	18.1	-4.2	10.9	24.4
17.	Emmons, Logan, McIntosh	26.1	-13.2	13.3	35.7
18.	Eddy, Foster	19.2	-2.9	5.5	30.31
19.	Stutsman	n/a	n/a	n/a	n/a
20.	Sheridan, Wells	18.3	-1.8	7.7	25.5
21.	Burleigh, Kidder	0.4	-11.5	4.8	5.7
22.	McLean, Mercer, Oliver	8.3	-31.1	43.7	-39.3
23.	Morton, Grant, Sioux	14.3	-15.3	11.4	26.2
24.	Slope, Hettinger, Bowman, Adams	30.6	-12.1	19.1	35.0
25.	Dunn, Stark	5.5	-18.0	10.1	3.4
26.	Golden Valley, Billings, McKenzie	4.9	-54.5	27.9	-50.8

Selective consolidation of these services is already occurring in North Dakota. County courts (general government) have been merged into district courts. Adjacent counties share some of the more specialized health and welfare services staff. County road and highway services now provide much of their maintenance and construction work through contracts with private companies that are large enough to achieve many economies of size.

The large ranges of cost savings from county consolidations under either the 15-county proposal or the 26-county alternative suggest that more than population and geography need to be examined in deciding where consolidation may reduce costs of services. Increased transportation costs are the largest reason for the increased cost of public safety services under both the 15-county proposal and the 26-county alternative. Nonlinear relationships between expenditures and the explanatory variables also cause costs to rise in many cases as counties are combined. Furthermore, the assumption that wages would be averaged as counties are consolidated is questionable. Employees may be able to resist any wage reductions, resulting in wages being set at the maximum of wages in the consolidated counties. If so, total cost savings for the 15-county proposal would decline from 4.9 percent to 3.0 percent and public safety costs would increase 31 percent rather than 25 percent.

### **Conclusions**

The results of this analysis provide a preliminary indication of the pitfalls that would be encountered in consolidating county government services. Due to the broad categories of services and reliance on secondary data for the statistical analysis, much of the variation in expenditures for county government services still has not been explained. Further research should estimate economies of size for more specific services using additional explanatory variables and primary data. Adjustment costs and economic impacts from reduced quality of services after consolidation also need to be estimated. However, the results demonstrate that consolidation sometimes increases rather than reduces costs of county government services and needs to be carefully evaluated before it is proposed.

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