

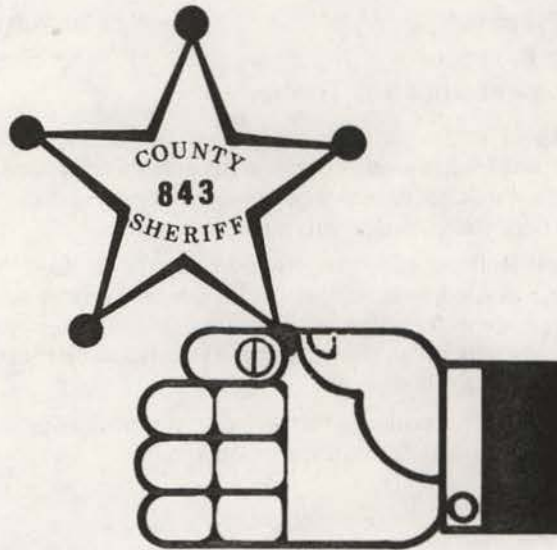
Cost of Public Service

Sheriff Protection

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Contents

Introduction	3
Methods of Estimating Expenditures	4
County Sheriff Protection	5
Estimating Sheriff Protection Costs	5
Estimating Population Growth's Impact	6
County Information Sources	8
Bibliography	8
Acknowledgments	8
Worksheet — Estimating Sheriff Protection Expenditures	9
Worksheet — Estimating Population Growth's Impact on Expenditures	10

This is one of eight bulletins supported by Title V of the Rural Development Act of 1972 on estimating costs of public service in Idaho communities of various size. The services covered in the series are:

- Education
- Fire Protection
- Police Protection
- Sewage Collection and Treatment
- Sheriff Protection
- Solid Waste Disposal
- Water Supply

A worksheet for estimating costs for each service area is designed to facilitate citizen use. Relationships are used to derive costs and are expressed in terms of state averages. You may use the standards as given to derive cost estimates for the services or change them to reflect the situation in your community.

Extension Bulletin 602, *Residential Growth: Its Benefits and Costs to the Local Community*, is used as a format for an overall look at what effects increases in the number of residential dwellings and people have on revenues for the public and private sector and on costs in the public sector. The estimation procedure is outlined for cities, counties and school districts.

This publication outlines a method of estimating your county's increased costs for sheriff protection caused by population growth.

About the Authors

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Cost of Public Service: Sheriff Protection

N. R. Rimbey and N. L. Meyer

This publication presents a method of estimating expenditures for sheriff protection and a method for estimating the impact of population growth on these expenditures. The cost estimates derived are based on relationships taken from various sources which approximate the actual situation in communities and counties. The relationships are based on state or national averages and can be changed to reflect the situation in your county. Worksheets are provided to help you in the estimation procedure.

Introduction

Idaho is currently one of the fastest growing states in the nation. This growth brings economic benefits such as increased tax revenue to the public sector, possibly more service-oriented jobs and increased spending in the private sector. This growth may also bring general social benefits such as meeting and interacting with people from different cultural backgrounds, more specialized health care and more cultural programs through schools and civic organizations.

However, this growth does not come without additional costs. Many communities and counties in Idaho are not prepared for this growth. The public sector (present residents) must handle the added costs of providing services to the new residents. For example, growth may create needs for a new sewage treatment plant, school buildings, fire and police facilities and equipment, water wells or reservoirs and garbage collection and disposal equipment. Sizable public expenditures may also be necessary for land acquisition and additional employees.

Areas can accommodate growth more easily if the public service infrastructure already exists. That means having excess capacity in the sewage treatment facility, school system and police department and that other services can absorb the population increases without the need for major capital expenditures. Excess capacity in public services does not exist in many rural areas.

The increasing of service capability coupled with the movement toward government spending limitations poses a severe problem for many Idaho communities. "How can we accommodate the rapid population growth and additional service demands of residents and finance the services with reduced or 'frozen' revenues?" This is the most perplexing issue facing state and local government officials.

One possible alternative for local government officials is a program which would require new development to pay its "fair share" of the added service costs. Although this may seem to be a simple policy move, this action will require certain kinds of information. For example, information should be collected and analyzed to determine: the present costs of various services, the estimated costs for new residents, when expansion of which capital facilities will be needed (based on capacities of existing systems and projected growth rates), and what the existing policy of the governmental unit is concerning who should pay the additional costs.

Present costs of services are available in the annual audit report or annual budget of the unit of government. The policy aspect may require investigation of procedures or conversations with the county administrator.

The cost estimates presented here are based on relationships or standards that typify state or national averages. Standards for each service are

presented with the intention that you will change or modify them to fit the situation in your municipality. Worksheets, an abbreviated interest table and sources of information within the county are also given to help you in the estimation process.

A word of caution should be injected at this point. The cost figures presented here are **estimates** of actual costs and should be analyzed carefully before basing policies upon them. To help you critically evaluate costs, remember that the standards given should be changed when they prove inaccurate. Variations between actual and estimated costs may result from using average figures, topography of the area, the time lag between estimation and construction and a variety of other circumstances.

Be advised, then, to use care in using the cost figures presented.

This publication was designed to give you, as a concerned citizen or government official, a **framework** for estimating the current costs of a public service. A method to estimate the added costs of population growth is also given. The service covered is sheriff protection.

Methods of Estimating Expenditures

You can estimate costs several ways. The procedure used most often in fiscal impact studies is known as the average cost method. This involves:

1. Using the existing budget or audit report to derive current costs of services.
2. Dividing these costs by number of people or households served to determine a per capita or per household cost for each service.

3. Projecting this cost to new residents by multiplying the per capita or household costs by the number of new residents or houses.

This technique may be adequate for projecting the operation and maintenance costs of services but will severely underestimate the impact if capital expansion is needed. The problem lies in basing the estimates on past costs.

A more reliable method is using average cost figures and adding estimated capital costs. In other words, you can use average cost figures from the budgets as well as the estimated increases in capital costs to derive estimates of the impact on expenditures.

The most reliable (and costly) estimation method is conducting a detailed audit of each department within the county to determine the actual costs per household (or resident) and determining the anticipated date and cost of needed facilities expansion. This would involve a detailed study of each employee's duties, the anticipated equipment and personnel needs and the municipality's projected growth rates. This procedure is obviously very time consuming and expensive. However, it is the most reliable method to support local policies which require new development to pay for added service cost.

The following section outlines standards and procedures for estimating existing costs and added costs of development for sheriff protection. This material should be used together with the information in Ext. Bull. 602, **Residential Growth: Its Benefits and Costs to the Local Community**, to derive estimates of the benefits and costs of community growth.

County Sheriff Protection

This publication examines the costs of providing sheriff protection for counties of different population sizes. All cost figures and relationships are based upon returns from a 1978 survey. The survey results are presented here in the form of 10 standards that can be used to estimate personnel and equipment needs and costs for different county populations.

Standard 1 — The ratio of officers to population varies with county size.

Population	Officers per population
500 to 2,999	1 per 500
3,000 to 5,999	1 per 1,000
6,000 to 19,999	1 per 1,500
20,000 to 34,999	1 per 1,800
35,000 and more	1 per 2,200

Standard 2 — The average officer salary and fringe benefits vary with the population served.

Population	Average salary and fringe benefits
500 to 6,499	\$ 9,200
6,500 to 14,999	11,000
15,000 and more	13,000

Standard 3 — Idaho counties have an average of .85 support staff for each officer for all populations of more than 3,000.

Standard 4 — Support staff salaries and benefits are 75 percent of the officers' salaries and benefits.

Standard 5 — Equipment and supplies costs are 20 percent of total annual salaries and benefits.

Standard 6 — The number of vehicles per officer varies with population.

Population	Vehicles per officer
500 to 9,999	1.00
10,000 to 24,999	0.74 ¹
25,000 and more	0.62 ¹

Standard 7 — The average cost per vehicle is \$6,500. Vehicles are traded every 2 years. Half of the vehicle force is traded 1 year and replaced with new vehicles; the other half is traded the following year for populations of 2,000 and more. The smaller populations are amortized for 5 years at 10 percent interest rate.

Standard 8 — Annual maintenance and operation cost of vehicles is 33.5 percent of total vehicle cost.

Standard 9 — Three hundred square feet of office/jail space is required for each full-time employee and construction costs are \$50 per square foot. The building is amortized at 10 percent for 30 years.

¹A partial vehicle can be represented by different levels of equipping a patrol vehicle. It can also indicate payment to individuals for use of their private vehicles.

Standard 10 — Annual maintenance and operation of the building is 7 percent of total construction costs.

Estimating Sheriff Protection Costs

Using the 10 standards, you can estimate the cost of providing sheriff protection for a county of a given size. As an example, consider a county with a population of 8,000.

Step 1 — Estimate the number of officers and their salaries and benefits using Standards 1 and 2.

$$8,000 \text{ population} \div 1,500 = 5.33 \text{ officers}$$

$$5.33 \text{ officers} \times \$11,000 \text{ salary and benefits per officer}$$

$$= \$58,630 \text{ officer salaries and benefits}$$

Step 2 — Estimate the number of support staff and their salaries and benefits using Standards 3 and 4.

$$5.33 \text{ officers} \times .85 \text{ staff/officer} = 4.5 \text{ support staff}$$

$$\$11,000 \times .75 = \$8,250 \text{ support staff salary and benefits}$$

$$4.5 \text{ support staff} \times \$8,250 \text{ per staff} = \$37,125$$

$$\text{support staff salaries and benefits}$$

Step 3 — Estimate the equipment and supplies costs using Standard 5.

$$\$95,755 \text{ total salaries and benefits} \times .20$$

$$= \$19,151 \text{ equipment and supplies costs}$$

Step 4 — Estimate the number and annual cost of vehicles² using Standards 6 and 7.

$$5.33 \text{ officers} \times 1 \text{ vehicle/officer} = 5.33 \text{ vehicles}$$

$$5.33 \text{ vehicles} \times \$6,500 \text{ cost/vehicle} = \$34,645 \text{ total vehicle cost}$$

Since vehicles are bought and traded every year, the annual cost would be **\$17,323** or half of the total cost.

Step 5 — Estimate the annual maintenance and operation cost of the vehicles using Standard 8.

$$\$34,645 \text{ total vehicle cost} \times .335$$

$$= \$11,606 \text{ annual vehicle maintenance and operation cost}$$

Step 6 — Estimate the size of building needed, the total construction cost and the annual payment on the building using Standard 9.³

$$9.8 \text{ employees} \times 300 \text{ sq. ft./employee} =$$

$$2,940 \text{ sq. ft. of building space}$$

$$2,940 \text{ sq. ft.} \times \$50 \text{ per sq. ft.} = \$147,000 \text{ total construction cost}$$

$$\$147,000 \times .106079 \text{ amortization rate for 30 years at 10 percent}$$

$$= \$15,594 \text{ total annual payment on building}$$

Step 7 — Estimate the annual maintenance and operation cost of the building using Standard 10.

$$\$147,000 \text{ total construction cost} \times .07$$

$$= \$10,290 \text{ total annual maintenance and operation of building}$$

²The purchase of vehicles and trade-in time varies considerably from county to county depending upon local policy. When you make your cost estimates, try to design your study to conform with local policies, and you will derive much more reliable cost estimates.

³See Table 1 for an example in using amortization rates and alternative amortization rate values.

Table 1. Amortization rates for different interest rates and loan periods.

Interest rate	Years					
	3	5	10	15	20	30
7	.381052	.243891	.142378	.109795	.094393	.080586
8	.388034	.250456	.149029	.116830	.101852	.088827
9	.395055	.257092	.155820	.124059	.109546	.097336
10	.402115	.263797	.162745	.131474	.117460	.106079
11	.409213	.270570	.169801	.139065	.125576	.115025
12	.416349	.277410	.176984	.146824	.133879	.124144
13	.423522	.284315	.184290	.154742	.142354	.133411
14	.430700	.291200	.191700	.162800	.150900	.142800
15	.437900	.298300	.199200	.171000	.159700	.152300

This table will help you calculate the annual payments on investments for community services. For example, the annual payments for a \$40,000 loan at 10 percent interest rate for 15 years can be calculated:

$$\begin{array}{r} \text{Loan amount} \times \text{amortization rate} = \text{annual payment} \\ (\$40,000) \quad (.131474) \quad (\$5,259) \end{array}$$

An annual payment of \$5,259 would pay the principal and interest on this loan and retire the debt in 15 years. If an interest rate and the time period for a loan are not listed in this table, your local bank can provide the figures.

Step 8 — Calculate the total annual cost of sheriff protection for a county of 8,000 people by adding the benefits and salaries of officers and support staff, equipment and supplies cost, annual vehicle cost and maintenance and operation of vehicles, annual payment on building and maintenance and operation of building.

Step 1. salaries and benefits of officers	\$58,630
Step 2. salaries and benefits of support staff	37,125
Step 3. other equipment and supplies	19,151
Step 4. annual vehicle cost	17,323
Step 5. maintenance and operation (vehicles)	11,606
Step 6. annual payment on building	15,594
Step 7. maintenance and operation (building)	10,290
total annual cost	\$169,719

Calculate the cost per capita by dividing the total cost by the population served:

$$\$169,719 \div 8,000 \text{ population} = \$21.21 \text{ per capita}$$

Table 2 gives cost estimates for other county populations.

Estimating Population Growth's Impact

You can also use the 10 standards given to estimate population growth's impact on sheriff's department costs. For example, what would happen to sheriff department costs in our example county of 8,000 if the population grew by 1,000?

The degree of impact will vary from county to county depending upon several factors. The type and location of the immigrants will determine the sheriff department's needs. Employees of a local construction project will have a different impact than the same number of permanent households.

The capacities of different areas of the department will also help determine the eventual cost impact. For example, a county with excess space (capacity) in the office/jail will have little need for new construction. A county without excess space

must consider construction of a new office/jail or expansion of the existing facility which will greatly influence costs.

The location of a development or the settling pattern of the immigrants will also determine the degree of impact on sheriff department costs. A development in a distant corner of the county will add much greater costs to sheriff protection than a similar development closer to the population center. Patrols in "new" areas can mean added personnel, operation and equipment costs which would not be necessary for a development closer to established patrol areas.

Our example estimates the added costs of population growth using the standards as written. You should change the standards to fit the situation in your county to derive better estimates.

For a sudden population growth of 1,000 in our example county of 8,000, the following variables will be affected.

Standard 1 — The number of officers will increase from 5.3 to 6.0, a change of .7.

Standard 2 — The salary expenditures for officers will increase from \$58,630 to \$66,000, a change of \$7,370.

Standard 3 — The number of support staff will increase from 4.5 to 5.1, a change of .6.

Standard 4 — The salary expenditures for support staff will increase from \$37,125 to \$42,075, a change of \$4,950.

Standard 5 — Equipment and supplies costs will increase from \$19,151 to \$21,615, a change of \$2,464.

Standard 6 — The number of vehicles will increase from 5.3 to 6, a change of .7.

Standard 7 — The total cost of vehicles will be \$39,000, and since half of the fleet is traded every

Table 2. Annual county sheriff costs by county population.

County population	No. of officers	No. of support staff	Officers salaries & benefits	Support staff salaries % benefits	No. of vehicles	Total cost of vehicles	Annual cost of vehicles	Other equipt. and supplies cost	M & O vehicles	Bldg. space (sq ft)	Total bldg. cost	Annual bldg. cost	M & O bldg.	Total annual cost	Annual cost per capita
500	1.0	—	9,200	—	1.0	6,500	1,715	1,840	2,178	300	15,000	1,591	1,050	17,574	35.15
1,000	2.0	—	18,400	—	2.0	13,000	3,429	3,680	4,355	600	30,000	3,182	2,100	35,146	35.15
1,500	3.0	—	27,600	—	3.0	19,500	5,144	5,520	6,533	900	45,000	4,774	3,150	52,721	35.15
2,000	4.0	—	36,800	—	4.0	26,000	13,000	7,360	8,710	1,200	60,000	6,365	4,200	76,435	38.22
2,500	5.0	—	46,000	—	5.0	32,500	16,250	9,200	10,888	1,500	75,000	7,956	5,250	95,544	38.22
5,000	5.0	4.3	46,000	29,670	5.0	32,500	16,250	15,134	10,888	2,790	139,500	14,798	9,765	142,505	28.50
7,500	5.0	4.3	55,000	35,475	5.0	32,500	16,250	18,095	10,888	2,790	139,500	14,798	9,765	160,271	21.37
10,000	6.7	5.7	73,700	47,025	5.0	32,500	21,678	24,145	10,888	3,720	186,000	19,731	13,020	210,187	21.02
15,000	10.0	8.5	130,000	82,875	7.4	48,100	24,050	42,575	16,114	5,550	277,500	29,437	19,425	344,476	22.97
20,000	11.1	9.4	144,300	91,650	8.2	53,300	32,175	47,190	17,856	6,150	307,500	32,619	21,525	351,957	17.90
25,000	13.9	11.8	180,700	115,050	8.6	55,900	33,475	59,150	18,727	7,710	385,500	40,893	26,985	474,980	19.00
30,000	16.7	14.2	217,100	138,450	10.4	67,600	33,800	71,110	22,646	9,270	463,500	49,168	32,445	564,719	18.82
35,000	15.9	13.5	206,700	131,625	9.9	64,350	39,000	67,665	21,557	8,820	441,000	46,781	30,870	544,198	15.55
45,000	20.5	17.4	266,500	169,650	12.7	82,550	41,275	87,230	27,654	11,370	568,500	60,306	39,795	692,410	15.39

year, the annual cost will increase from \$17,323 to \$19,500, a change of \$2,177.

Standard 8 — Annual maintenance and operation of vehicles will increase from \$11,606 to \$13,065, a change of \$1,459.

Standard 9 — The size of the building would be increased to 3,330 square feet at a total added cost of \$19,500 or \$2,069 annually (if the addition is financed at 10 percent for 30 years).

Standard 10 — Annual maintenance and operation of the building will increase from \$10,290 to \$11,655, a change of \$1,365.

The total added cost of 1,000 new residents settling in the county is the difference in costs or **\$21,853** (\$191,572 - \$169,719). This is about **\$21.85** per new resident in added costs or **\$2.43** per capita if allocated to the total county population (9,000 after growth).

County Information Sources

- The county sheriff should be able to provide information on personnel needs and requirements, special problems concerning growth, most of the cost figures listed as assumptions in this publication and equipment use and needs.

Acknowledgment

The Bureau of Public Affairs Research at the University of Idaho, Moscow, provided a list of Idaho sheriff offices, addresses and phone numbers for the survey upon which this publication is based.

- The county budget will provide information on the current costs. Generally, the budget will not provide information on equipment and personnel. Budgets are prepared on the basis of revenues and expenditures and emphasize gross amounts. It is usually difficult to tell what is taking place within a department by using a budget.

- The building inspector should be able to tell you the necessary building requirements for a jail/office complex. This information would be helpful if the jail/office is to be expanded or a new one constructed.

- Local financial institutions will be able to provide information on loan rates and other terms concerning financing the building and equipment.

- The county commissioners or county manager may be able to provide information on some of the concerns facing the sheriff's department, expected growth rate and growth areas and other considerations regarding the service.

Bibliography

Mackey, R. Bruce. 1977. Costs for rural community services in Nevada — An economic engineering approach. Agr. Exp. Sta. Bull. T21, Univ. of Nevada, Reno.

WORKSHEET

Estimating Sheriff Protection Expenditures

- A. _____
County population
- B. _____ = (_____ × _____)
Number of officers 1,000 population Standard 1 value
- C. _____ = (_____ × _____)
Officer salaries and benefits (B) Estimated number of officers Standard 2 value
- D. _____ = (_____ × _____)
Number of support staff (B) Estimated number of officers .85
Standard 3
- E. _____ = (_____ × _____)
Support staff salaries and benefits (D) Number of support staff .75
Standard 4
× _____)
Standard 2
- F. _____ = (_____ + _____)
Cost equipment and supplies (C) Officers salaries and benefits (E) Support staff salaries and benefits
× _____)
.20
Standard 5
- G. _____ = (_____ × _____)
Number of vehicles (B) Number of officers Standard 6
- H. _____ = (_____ × _____)
Total vehicle cost Number of vehicles Standard 7 vehicle cost
- I. _____ = (_____ × _____)
Annual vehicle cost (H) Total vehicle cost Standard 7 value
- J. _____ = (_____ × _____)
Annual vehicle maintenance and operation cost (H) Total vehicle cost .335
Standard 8
- K. _____ = (_____ + _____)
Total building space (sq. ft.) (B) Number of officers (D) Number of support staff
× _____)
300 sq ft
Standard 9
- L. _____ = (_____ × _____)
Total building cost (K) Building space (sq. ft.) \$50
Standard 9
- M. _____ = (_____ × _____)
Annual building cost (L) Total building cost Amortization rate (Table 1)
- N. _____ = (_____ × _____)
Annual building maintenance and operation (L) Total building cost .07
Standard 10
- O. _____ = _____ + _____
Total annual cost (C) Officers salaries and benefits (E) Support staff salaries and benefits
+ _____ + _____ + _____
(F) Cost of equipment and supplies (I) Annual vehicle cost (J) Annual vehicle maintenance and operation
+ _____ + _____
(M) Annual building cost (N) Annual building maintenance and operation
- P. _____ = _____ ÷ _____
Annual cost per capita (O) Total annual cost (A) County population

O. $\frac{\text{Total annual new cost}}{\text{(C) New officers salaries and benefits} + \text{(E) New support staff salaries and benefits} + \text{(F) Cost new equipment and supplies} + \text{(I) Annual new vehicle cost} + \text{(M) Annual cost new building} + \text{(N) Annual new building maintenance and operation}} = \frac{\text{(O) Total annual cost}}{\text{(J) Annual new vehicle maintenance and operation cost}}$

P. $\frac{\text{Annual cost per capita}}{\text{(O) Total annual cost}} = \frac{\text{Total population of county, including new growth}}$

Q. $\frac{\text{Annual cost per new person}}{\text{(O) Total annual cost}} = \frac{\text{Total new population of county}}$

Cost of Public Service: Sheriff Protection is the sixth in a series of bulletins on estimating costs of public service in various size Idaho communities. Other bulletins in that series available from the University of Idaho Agricultural Information Department are as follows:

- EXT 602 Residential Growth: Its Benefits and Costs
to the Local Community50 cents
- EXT 604 Cost of Public Service: Education25 cents
- EXT 605 Cost of Public Service: Fire Protection25 cents
- EXT 606 Cost of Public Service: Police Protection25 cents
- EXT 607 Cost of Public Service:
Sewage Collection and Treatment25 cents
- EXT 609 Cost of Public Service: Solid Waste Disposal25 cents
- EXT 610 Cost of Public Service: Water Supply25 cents

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