

ISER RESEARCH SUMMARY

Institute of Social and Economic Research, University of Alaska

September 1984, R.S. No. 20

Economic Impacts of Capital Spending in Alaska

A report by the University's Institute of Social and Economic Research indicates that Alaska's construction industry is increasingly supported by state capital spending. State capital appropriations in 1982 (not including loan programs) of \$1,203.2 million represented a fivefold increase above the average annual expenditure of \$237 million during the 1970s. Capital spending in 1982 directly produced 7,450 jobs and supported 5,731 additional jobs, for a total of 13,181. This amounts to an expenditure of approximately \$91,000 for the equivalent of each full-time job of one year's duration (Table 1). If all funds appropriated had been spent in 1982 and all jobs produced in 1982, this would have accounted for one-third of all construction jobs and 6 percent of total jobs in the state for that year.

The report is the first of a two-part project designed to estimate the economic impact of capital expenditures for different types of projects and to assess the dollars required to operate and maintain these projects in future years. Types of capital expenditures being investigated include highways, schools, office buildings, and sewer works. Private construction activities have similar impacts on the economy. The direct, indirect, and induced effects¹ of particular construction efforts on Alaska's economy are measured in terms of employment, wages and salaries, personal income, value added, and output.

For example, as shown in Table 2, \$1 million in school construction produces the equivalent of 10.6 jobs of one year's duration, \$355 thousand in wages, \$354 thousand in resident personal income, and

\$1.46 million of total output in Alaska. Table 2 also demonstrates how the size of the economic impact varies with the type of project. In general, the more labor-intensive projects (for example, maintenance, as opposed to initial construction), have larger impacts on the economy. This occurs because more of each dollar spent on labor remains within the economy, compared to a dollar spent on materials which are procured almost exclusively from outside the state. In addition, the higher wages in heavy construction result in a higher ratio of indirect and induced employment to direct employment than other categories of construction. This occurs because indirect and induced employment depend upon the proportion of personal income that remains in Alaska rather than the number of directly created jobs.

Table 2 also illustrates that dollars spent on general government operations create both direct and total economic effects two-and-one-half times those spent on capital projects. Thus, if supporting (subsidizing) employment is a goal of state spending, expenditures in general government operations have significantly greater economic impacts than do capital expenditures.

Factors Affecting the Economic Impact of Construction Spending

The impact of construction spending is largely determined by how fast the money "leaks out" of the economy. This leakage depends primarily on the local availability of (1) construction "inputs" (labor and materials) and (2) goods and services purchased by construction employees. Figure 1 shows how \$1 million of school construction funds is typically spent. Little of the 55 percent allocated to materials impacts the local economy because almost no materials are manufactured in Alaska. For imported materials, only portions of the wholesale and transport margins provide income for firms within the state. The local direct impact occurs primarily through

¹*Direct Effect* is the direct purchase of a commodity, service, or labor input needed to design or construct a project. *Indirect Effect* results from the demand for commodities, services, and labor needed to produce the inputs required to construct the project. *Induced Effect* results when individuals spend in Alaska the wages, salaries, and other income resulting from the direct and indirect effects of the project.

TABLE 1
Estimated Employment Impact of 1982 State Capital Appropriations^{a,b}

Budget Category	Appropriation (million \$)	Direct	Total
		Employment Produced ^c	Employment Produced ^{c,d}
Building—education	\$139.8	741	1,485
Building—other	141.1	810	1,510
Highway, airport, & other transportation	231.4	854	1,995
Water & Sewer	26.3	122	235
Harbors, docks, flood control	34.7	215	379
Energy Projects	368.2	2,279	4,024
Equipment	57.9	—	—
Other	61.0	—	—
Subtotal	\$1,060.4	5,021	9,628
Engineering, design, & planning	142.8	2,429	3,553
Total	\$1,203.2^e	7,450	13,181

^aIncluding municipal grants but not loan programs.

^cAverage annual equivalent.

^bBased upon appropriation bills.

^dTotal = direct + indirect + induced.

TABLE 2
Economic Impact of \$1 Million of State Spending: Contract Construction and Operations

Project Type	Average Annual ^{a,b} Equivalent Employment Produced (Jobs)		Wages and Salaries ^d (thousand \$)		Output ^e (thousand \$)		Personal Income ^f (thousand \$)	
	Direct	Total ^c	Direct	Total ^c	Direct	Total ^c	Direct	Total ^c
	Construction							
School	5.30	10.62	\$240	\$355	\$1,000	\$1,462	\$224	\$354
Office	5.74	10.70	260	368	1,000	1,435	238	359
Hospital	5.97	11.30	270	385	1,000	1,455	252	381
Sewers	4.64	8.94	210	307	1,000	1,397	212	321
Highway and Street	3.69	8.62	220	335	1,000	1,489	216	347
Land Reclamation	6.19	10.93	280	384	1,000	1,425	276	394
Operations								
Highway and Street Maint	6.71	12.45	400	533	1,000	1,568	371	524
Nonfarm Building Maint.	7.73	12.83	350	461	1,000	1,452	329	453
General Govt. Operations	17.01	24.88	530	701	1,000	1,700	584	776

^aAt 1982 average wage rate levels.

^bWage and salary employment in Alaska is independent of the residence of the worker (does not include proprietors).

^cTotal = direct + indirect + induced.

^dWages and salaries is that paid to workers for employment which occurs in Alaska independent of the place of residence of the worker.

^eDirect output by construction firm to government plus other output attributable to Alaskan businesses. In the trade sector this is the trade margin rather than the value of goods sold.

^fThe component of value added which accrues to Alaskan residents. Because a portion of wages and salaries, proprietor income, and profits which is project-generated accrues to nonresidents, the personal income impact is not much larger than that of wages and salaries.

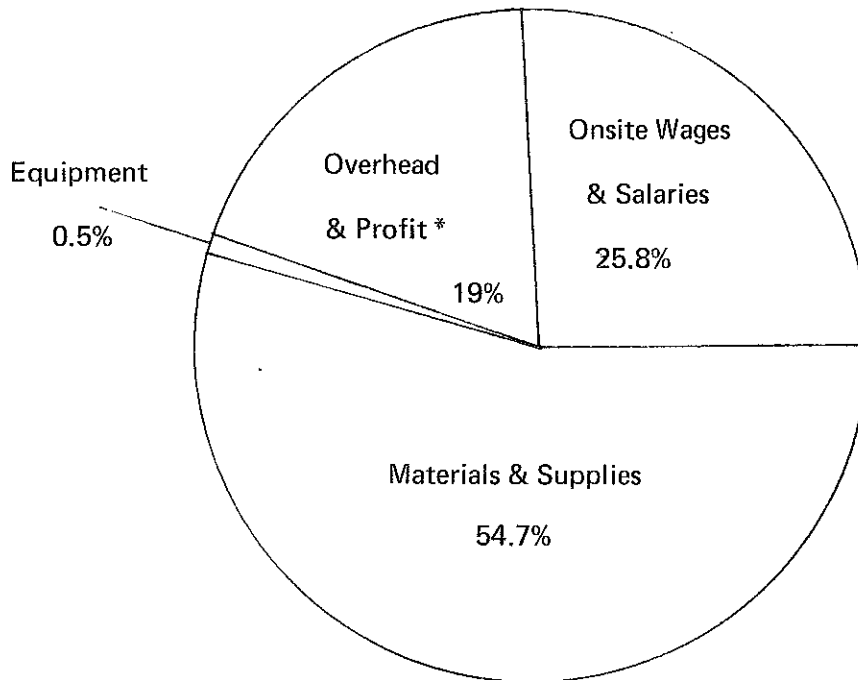


Figure 1. Distribution of Contract Costs for Public Schools

*Includes off-site wages, fringe benefit, construction financing, inventory, other overhead, and profit.

Source: U.S. Department of Labor, Bureau of Labor Statistics, "Labor and Material Requirements for Sewer Works Construction," Bulletin 2003, January 1979, Tables 12, 13, and 14.

wage and salary payments, although some workers may remain in the state only until the job is finished and leave with their earnings. Subsequent impacts result primarily when workers spend their wages in the local economy. Most money spent on commodity purchases flows out of the local economy to the places where those commodities are produced. Money spent on local services, however, remains within the local economy to generate an additional round of spending.

Additional Economic Impacts

In addition to those effects described and measured above, there may be other effects before, during, and after construction which add to the economic impact. These are:

- **Anticipatory Effects.** The announcement of a project may cause the business sector to invest in expansion of supporting industries before construction. Preconstruction planning and design may also impact the economy.
- **Accelerator Effects.** Investment in the business sector (new stores) or household sector

(new housing) may result if the general level of economic activity strains the capacity of existing infrastructure.² This is a major factor in generating business cycles.

- **Government Effects.** Growth in the private sector generally increases the demand for goods and services provided by the public sector.
- **Operation and Maintenance Effects.** The operation and maintenance of new capital facilities require labor, commodities, and services. Operations and maintenance also generate indirect and induced effects.
- **Structural Change Effects.** The existence of a new capital facility may produce an increase or even a decrease in economic activity because it changes the structure of the econ-

²Economic infrastructure is the underlying foundation upon which an economy is built. It includes the basic supporting services required by an economy to operate, such as communications, transportation, and public utilities.

omy. One type of structural change is a change in the price or availability of inputs to production. For example, a hydroelectric facility which reduced the price of electricity could attract industry that would otherwise not locate in the state, or a transportation improvement could make local businesses less competitive in relation to lower 48 firms. Structural change can also result from a change in market size. A recent phenomenon in Alaska has been the establishment of new types of business services made possible by an

increase in the size of the Alaskan market. The economic "scale" effects occur independently of the source of the increase in market size, i.e. private or public investments.

This Research Summary was written by Scott Goldsmith of the Institute of Social and Economic Research, University of Alaska. Address any questions to Scott Goldsmith at ISER, 707 A Street, Suite 206, Anchorage, Alaska 99501, telephone 278-4621.

★ ★ ★ ★

RECENT RESEARCH SUMMARIES

- "Alaska Statewide Housing Needs Study," by Cheryl K. Thomas Associates, et al., November 1983, RS No. 12.
- "Effective Schooling in Rural Alaska," by Judith Kleinfeld and G. Williamson McDiarmid, January 1984, RS No. 13.
- "The Anchorage Consumer Price Index—How Accurate?" by Scott Goldsmith and Phillip Rowe, January 1984, RS No. 14.
- "Effects of State Fisheries Management on Nonresident Fishermen," by Gunnar Knapp, Thomas A. Morehouse, and Karen A. White, January 1984, RS No. 15.
- "Alaska's Urban and Rural Governments," by Thomas A. Morehouse, Gerald A. McBeath, and Linda Leask, February 1984, RS No. 16.
- "Alaska Resources Development: What Beyond Prudhoe Bay?" by Thomas A. Morehouse, et al., February 1984, RS No. 17.
- "Alaska Economic Projections and the Effects of OCS Development," by Matt Berman and Teresa Hull, June 1984, RS No. 18.
- "Import Substitution in Alaska," by Lee Huskey, Arlon R. Tussing, and Thomas Singer, June 1984, RS No. 19.

RESEARCH SUMMARY (No. 20)

Institute of Social and Economic Research
 Lee Gorsuch, Director
 707 "A" Street, Suite 206
 Anchorage, Alaska 99501

Non-Profit Org.
 U.S. Postage
 PAID
 Anchorage, Alaska
 Permit No. 540