ANALYSIS OF ECONOMIC AND SOCIAL IMPACT OF ALTERNATIVE ROUTES TO THE ALASKA ARCTIC GAS PIPELINE

A. Economic Analysis (F-3-I-A)

by

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I. DESCRIPTION OF THE INPUTS SCENARIOS:

All the basic data for the following development scenarios were supplied to the contractor by the Bureau of Land Management, Natural Resources Division, Anchorage, Alaska. The totals of capital values and employment in construction of pipelines, pumping stations, and liquefaction and marine terminal facilities, regardless of the route followed, are only those both which are directly attributable to the gas pipeline construction and operation, and for which economic impact occurs within the geographic boundaries of the State of Alaska and its adjacent waters. Thus, although employment on the Canadian section of the Prime Route is not counted in the economic impact on the Alaskan economy, employment on the offshore portion of the Offshore Route off Alaska's coast is counted.

It should be apparent from a close examination of the various tables which follow that in several cases, the initial impact on one factor in the Alaskan economy may be identical between two routes, but that it may differ in other respects. For example, the levels and schedules of production for all the trans-Canada pipeline routes are the same, but the Interior, Fort Yukon, and Fairbanks Routes require more construction labor than the Prime, Offshore, or Onshore Routes. Only the Prime and Onshore Routes show the same capital costs among the Canadian options.

Since some economic growth will occur in the State of Alaska in any case because of influences not associated with construction of a natural gas pipeline, the measure of the impact of pipeline development actually

constitutes a departure of economic growth from a path of development which would otherwise take place. Accordingly, a run of the ISEGR MAP model was done which allowed for probable petroleum development but no natural gas development, and the economic results of this "base case" were compared with the results of the MAP model runs using employment and revenue from each of the possible routes. The difference between each natural gas route and the base case constituted the impact of choosing that route for development.

Finally, since the economic results depend crucially on the state revenues generated in each scenario, together with the uses the state chooses for the funds, sensitivity analysis was done for two wellhead prices of natural gas and different levels of production. The state uses of funds were assumed to be saving and spending on current account. Time did not permit sensitivity analysis of different savings rates.

A. THE TRANS-CANADA ROUTES AND ASSUMPTIONS

The Trans-Canada pipeline options include the Prime Route and five alternatives: the Offshore Route, the Onshore Route, the Interior Route, the Fort Yukon Route, and the Fairbanks Route. All these routes were assumed to have 48-inch pipelines and to be operated at the same level of production as the Prime Route. Consequently, production taxes and royalties are identical for all these routes (Table 1). The differences

Table 1

WELLHEAD VALUE OF NATURAL GAS
AND PRODUCTION TAXES GENERATED,
ALL TRANSCANADA PIPELINE ROUTES

Year	Wellhead Price per MCF[1]	Gas Production MMCF per Day[2]	Wellhead Value 10^3 per Year	Royalties[3] 10^3	Production Tax[4] 10^3	State Total Revenue 10^3
1976	$ .50	0	$ 0	$ 0	$ 0	$ 0
77	.50	0	0	0	0	0
78	.50	0	0	0	0	0
79	.50	0	0	0	0	0
80	.50	2,000	365,000	45,625	14,600	60,225
81	.50	2,000	365,000	45,625	14,600	60,225
82	.50	2,040	372,300	46,538	14,892	61,430
83	.50	2,250	410,625	51,328	16,425	67,753
84	.50	2,250	410,625	51,328	16,425	67,753
85	.50	2,250	410,625	51,328	16,425	67,753
86-90	.50	2,250	410,625	51,328	16,425	67,753

[1]Wellhead price supplied by client.

[2]Production schedule, 3rd Supplement to Alaska Arctic Gas Pipeline Co. Application.

[3]Royalties at 12.5 percent of value of production.

[4]Production tax at 4 percent of value of production.

in the total value of capital equipment and the levels of construction and operating employment are due mostly to the length of the line within Alaska, and the number of pumping and chilling stations required because of length of line and terrain. The differences in state property taxes generated are due to the differences in the value of capital equipment in place in Alaska under each of the choices of route.

The Prime Route

The Prime Route generates little direct employment in Alaska. The maximum occurs during 1980 when average construction employment reaches 682, and the pipeline is completed (Table 2). Arctic Gas expects operations to add seven people to its Anchorage area staff, while the rest are employed in the Interior Region. All construction employment is assigned to the Interior Region because the route is far north of existing support areas in other regions.

All expenditures for capital are assumed to be made outside the state so they contribute only to value of capital in place. There is some supporting construction activity which occurs as a result of pipeline development and which is centered in Fairbanks and Anchorage areas. This is included in the indirect impacts traced by the MAP model. Under the basic assumption of 2.25 mmcf per day, the pipeline construction begins in 1976 and results in $496 million of pipe and pump stations in place by 1980, the year of completion. Property taxes amount to nearly $10 million (Table 3). The state collects taxes and royalties on the throughput, beginning in 1980 and reaching a maximum of $678 million per year.

Table 2

ESTIMATED TAXES, CONSTRUCTION EMPLOYMENT,
AND MINING EMPLOYMENT GENERATED BY
PRIME ROUTE, ONSHORE ROUTE

Year	Property Taxes[1] $10^3	Production Taxes and Royalties[2] $10^3	Mining Employment:[3] Anchorage	Mining Employment:[3] Interior	Construction Employment:[4] Interior
1976	$ 458	$ 0	0	0	0
77	1,343	0	0	0	38
78	4,104	0	0	0	137
79	7,394	0	0	0	567
80	9,919	60,225	7	32	682
81	9,919	60,225	7	32	0
82	9,919	61,430	7	32	0
83	9,919	67,753	7	32	0
84	9,919	67,753	7	32	0
85	9,919	67,753	7	32	0
86-90	9,919	67,753	7	32	0

[1]Property taxes at current 20 mill rate.

[2]Production taxes at 4 percent of value, royalties at 12.5 percent of value.

[3]Taken from Alaska Arctic Gas Pipeline Company, Application, Section G, Volume I, p. 71, "Operations and Maintenance Plan."

[4]Taken from AAGPC, Application, Table II F-1, modified to reflect initiation of construction in 1977. All construction employment assigned to Interior region.

Table 3

CUMULATIVE CAPITAL COSTS (VALUE IN PLACE)
AND ESTIMATED PROPERTY TAXES,
PRIME ROUTE, ONSHORE ROUTE

(Thousands of Dollars)

Year	Capital Value[1]	Property Taxes[2]
1976	$ 22,879	$ 458
77	67,170	1,343
78	205,205	4,104
79	369,683	7,394
80-90	495,936	9,919

[1]Alaska Arctic Gas Pipeline Co., Second Supplement to the Application, Exhibit K - "Cost of Facilities", Jan. 21, 1975.

[2]Property taxes at 20 mill rate.

The Offshore Route

Under this alternative, the submarine pipeline follows the coastline of the Beaufort Sea into Canada. The direct employment schedule, including that required to build additional pump stations for expanding capacity is assumed to be the same for this route as for the Prime Route, for the same reasons, and because of lack of information about any differences in labor requirements for the two routes (Table 4).

Largely because of construction requirements offshore, the value of capital in place is higher for this alternative than on the Prime Route. In the year of completion, 1980, the capital required in Alaska for the basic flow of 2.25 mmcf is almost $591 million. Throughput value and production taxes plus royalties are the same as the Prime Route (Table 5).

The Onshore Route

This alternative is similar to the Offshore Route but is an onshore rather than a submarine pipeline. Since it is located in the same geographical area, it is of similar length and since there is little or no information on why employment should differ from that on the Prime Route for other reasons, the schedule of exogenous employment was assumed to be identical to that on the Prime Route.

The Onshore Route has a very similar probable capital configuration requirement to that of the Prime Route; therefore, in the absence of any information on why it should differ, these were assumed identical to that of the Prime Route. Throughput was also identical; thus, the MAP model

Table 4

ESTIMATED TAXES, CONSTRUCTION EMPLOYMENT,
AND MINING EMPLOYMENT GENERATED BY
OFFSHORE ROUTE

Year	Property Taxes[1] $10^3	Production Taxes and Royalties[2] $10^3	Mining Employment:[3] Anchorage	Mining Employment:[3] Interior	Construction Employment:[4] Interior
1976	$ 544	$ 0	0	0	0
77	1,595	0	0	0	38
78	4,881	0	0	0	137
79	8,793	0	0	0	567
80	11,818	60,225	7	32	682
81	11,818	60,225	7	32	0
82	11,818	61,430	7	32	0
83	11,818	67,753	7	32	0
84	11,818	67,753	7	32	0
85	11,818	67,753	7	32	0
86-90	11,818	67,753	7	32	0

[1]Property taxes at current 20 mill rate.

[2]Production taxes at 4 percent of value, royalties at 12.5 percent of value.

[3]Same as Prime Route.

[4]Same as Prime Route.

Table 5

CUMULATIVE CAPITAL COSTS (VALUE IN PLACE)
AND ESTIMATED PROPERTY TAXES,
OFFSHORE ROUTE

(Thousands of Dollars)

Year	Capital Value[1]	Property Taxes[2]
1976	$ 27,181	$ 544
77	79,771	1,595
78	244,041	4,881
79	439,628	8,798
80-90	590,900	11,818

[1]Cost based on AAGPC, 2nd Supplement to the Application, Schedule K, "Cost of Facilities". Annual proportions were assumed to be identical to Prime Route.

[2]Property taxes at 20 mill rate.

is not able to distinguish any differences between the economic impact of the Prime Route and the Onshore Route.

The Interior Route

The Interior Route passes considerably to the south of the Prime Route, and adds to both the pipe mileage and the value of capital equipment in place. The value of capital equipment rises to $1.1 billion in 1980, the year of completion, yielding $22 million per year in property taxes. Peak employment occurs in 1980, when there are 2,738 workers on the construction project. Throughput is assumed to be the same as the Prime Route (Tables 6, 7).

The Fort Yukon Route

Still further south than the Interior Route, this route has more miles of pipe in Alaska and requires more compressor-chiller stations. Taxable property value in place rises to $1.4 billion in the year of completion and yields $28 million per year in property taxes (Table 8). Employment peaks at a monthly average of 4,107 construction workers in 1980, the year of completion (Table 9). Throughput is again identical to the Prime Route.

Table 6

CUMULATIVE CAPITAL COSTS (VALUE IN PLACE)
AND ESTIMATED PROPERTY TAXES,
INTERIOR ROUTE

(Thousands of Dollars)

Year	Capital Value[1]	Property Taxes[2]
1976	$ 50,600	$ 1,012
77	148,500	2,970
78	454,300	9,086
79	818,400	16,386
80-90	1,100,000	22,000

[1]Cost based on AAGPC, 2nd Supplement to the Application, Schedule K, "Cost of Facilities". Annual proportions were assumed identical to the Prime Route.

[2]Property taxes at 20 mill rate.

Table 7

ESTIMATED TAXES, CONSTRUCTION EMPLOYMENT,
AND MINING EMPLOYMENT GENERATED BY
INTERIOR ROUTE

Year	Property Taxes[1] 10^3	Production Taxes and Royalties[2] 10^3	Mining Employment:[3] Anchorage	Mining Employment:[3] Interior	Construction Employment:[4] Interior
1976	$ 1,012	$ 0	0	0	0
77	2,970	0	0	0	152
78	9,086	0	0	0	548
79	16,368	0	0	0	2,268
80	22,000	60,225	7	54	2,738
81	22,000	60,225	7	54	0
82	22,000	61,430	7	54	0
83	22,000	67,753	7	54	0
84	22,000	67,753	7	54	0
85	22,000	67,753	7	54	0
86-90	22,000	67,753	7	54	0

[1]Property taxes at current 20 mill rate.

[2]Production taxes at 4 percent of value, royalties at 12.5 percent of value.

[3]Interior Department Draft Environmental Impact Statement, Part II, p. 1522.

[4]Construction employment was based on using twice as many workers as the Prime Route, year around, over two years. This reflects the greater line distance in Alaska.

Table 8

CUMULATIVE CAPITAL COSTS (VALUE IN PLACE)
AND ESTIMATED PROPERTY TAXES,
FT. YUKON ROUTE

(Thousands of Dollars)

Year	Capital Value[1]	Property Taxes[2]
1976	$ 64,400	$ 1,288
77	189,000	3,780
78	578,200	11,564
79	1,041,600	20,832
80-90	1,400,000	28,000

[1]Cost based on AAGPC, 2nd Supplement to the Application, Schedule K, "Cost of Facilities". Annual proportions were assumed identical to the Prime Route.

[2]Property taxes at 20 mill rate.

Table 9

ESTIMATED TAXES, CONSTRUCTION EMPLOYMENT,
AND MINING EMPLOYMENT GENERATED BY
FT. YUKON ROUTE

Year	Property Taxes[1] $10^3	Production Taxes and Royalties[2] $10^3	Mining Employment:[3] Anchorage	Mining Employment:[3] Interior	Construction Employment:[4] Interior
1976	$ 1,288	$ 0	0	0	0
77	3,780	0	0	0	228
78	11,564	0	0	0	822
79	20,832	0	0	0	3,402
80	28,000	60,225	7	60	4,107
81	28,000	60,225	7	60	0
82	28,000	61,430	7	60	0
83	28,000	67,753	7	60	0
84	28,000	67,753	7	60	0
85	28,000	67,753	7	60	0
86-90	28,000	67,753	7	60	0

[1]Property taxes at current 20 mill rate.

[2]Production taxes at 4 percent, royalties at 12.5 percent.

[3]Department of Interior Draft Environmental Impact Statement, Part II, p. 1814. Total based on length of line in Alaska.

[4]Construction assumed to require 50 percent more labor than Interior Route, based on line distance, during the same construction period.

The Fairbanks - Alaska Highway Route

The Fairbanks-Alaska Highway Route is the southernmost of the pure overland options. This is also the only route of the Trans-Canada type which results in direct construction employment in a region of the state other than the Interior. Because of additional mileage in Alaska, taxable property in place rises to $2.2 billion in 1980, resulting in state property tax collections of $44 million that year (Table 10). Total construction labor peaks at a monthly average of 6,845 workers, of which 46 percent are employed in the Fairbanks region (Table 11). Throughput is the same as the Prime Route.

B. THE LNG OPTIONS AND ASSUMPTIONS

The client has identified four major options which will require the transportation of natural gas by liquid natural gas (LNG) tanker to ports on the West Coast of the lower 48 states. These differ from the Trans-Canada routes in all three exogenous parameters: capital value created, level and schedule of employment, and planned throughput. They are each assumed to have the same throughput as the other three (Table 12), but differ significantly among themselves in the amount of capital value in place and the level of employment. For this reason, they can be expected to have different effects on the Alaskan economy. Of interest is the fact that El Paso has forecast a higher level of production for the LNG routes

Table 10

CUMULATIVE CAPITAL COSTS (VALUE IN PLACE)
AND ESTIMATED PROPERTY TAXES,
FAIRBANKS - ALASKA HIGHWAY ROUTE

(Thousands of Dollars)

Year	Capital Value[1]	Property Taxes[2]
1976	$ 101,200	$ 2,024
77	279,000	5,580
78	908,600	18,172
79	1,636,800	32,736
80-90	2,200,000	44,000

[1]Cost based on AAGPC, 2nd Supplement to the Application, Schedule K, "Cost of Facilities". Annual proportions were assumed identical to the Prime Route.

[2]Property taxes at 20 mill rate.

Table 11

ESTIMATED TAXES, CONSTRUCTION EMPLOYMENT,
AND MINING EMPLOYMENT GENERATED BY
ALASKA ARCTIC GAS FAIRBANKS-ALASKA HIGHWAY ROUTE

Year	Property Taxes[1] 10^3	Production Taxes and Royalties[2] 10^3	Mining Employment:[3]			Construction Employment:[4]	
			Anchorage	Interior	Fairbanks	Interior	Fairbanks
1976	$ 2,024	$ 0	0	0	0	0	0
77	5,580	0	0	0	0	207	173
78	18,172	0	0	0	0	740	630
79	32,736	0	0	0	0	3,062	2,608
80	44,000	60,225	7	35	26	3,697	3,148
81	44,000	60,225	7	35	26	0	0
82	44,000	61,430	7	35	26	0	0
83	44,000	67,753	7	35	26	0	0
84	44,000	67,753	7	35	26	0	0
85	44,000	67,753	7	35	26	0	0
86-90	44,000	67,753	7	35	26	0	0

[1]Property taxes at current 20 mill rate.

[2]Production taxes at 4 percent of value, royalties at 12.5 percent of value.

[3]Department of Interior Draft Environmental Impact Statement, Part II, page 2121.

[4]Construction employment based on 2.5 times the manpower required for the Interior Route, over the same time period. No construction schedule is available.

Table 12

WELLHEAD VALUE OF NATURAL GAS

AND PRODUCTION TAXES GENERATED,

ALL LNG ROUTES

Year	Wellhead Price per MCF[1]	Gas Production MMCF per Day[2]	Wellhead Value 10^3 per Year	Royalties[3] 10^3	Production Tax[4] 10^3	State Total Revenue 10^3
1976	$ .50	0	$ 0	$ 0	$ 0	$ 0
77	.50	0	0	0	0	0
78	.50	0	0	0	0	0
79	.50	0	0	0	0	0
80	.50	1,649	300,943	37,618	12,038	49,656
81	.50	1,756	320,470	40,059	12,819	52,878
82	.50	1,998	364,635	45,579	14,585	60,164
83	.50	2,550	465,375	58,172	18,615	76,787
84	.50	3,052	556,990	69,624	22,280	91,904
85	.50	3,065	559,363	69,920	22,375	92,295
86-90	.50	3,500	638,750	79,844	25,550	105,394

[1]Wellhead price supplied by client.

[2]Docket No. CP75-Exhibit H, Schedule 4. "Gas Available to Pipeline" - El Paso Alaska Co.

[3]Royalties at 12.5 percent of value of production.

[4]Production tax at 4 percent of value of production.

than Arctic Gas has for the Trans-Canada routes. A sensitivity test was conducted to discover the importance of this difference in assumptions.

The Point Gravina Route

The base case for the LNG options is the El Paso Natural Gas proposal for a pipeline generally following the Trans-Alaska oil pipeline corridor, until it splits off near Valdez and proceeds to tidewater near Gravina Point on Prince William Sound. The principal difference in the economics of this line and the various Trans-Canada options is that the entire length of the line is within the State of Alaska. In addition, terminal and liquefaction facilities are required. Between the two of them, these factors imply capital equipment in place worth about $3.6 billion by the year of completion, yielding almost $72 million in property taxes every year to the state (Table 13).

Employment occurs in three regions if this route is chosen: Southcentral, Interior, and Fairbanks. Because of the terminal and liquefaction plants, approximately 600 people are employed in operations (400 in the Southcentral Region, and 100 in each of the other two) (Tables 14, 15). Peak employment is reached in 1980 with 7,600 construction workers, but production does not reach its maximum until 1986 when flow reached 3.5 million cubic feet per day. At 50 cents per thousand cubic feet, this is nearly $638.8 million per year, which yields production taxes and royalties of $105.4 million per year. Part of the difference between the LNG and Trans-Canada options arises from this different assumed level of production in the applications.

Table 13

CUMULATIVE CAPITAL COSTS (VALUE IN PLACE)
AND ESTIMATED PROPERTY TAXES,
POINT GRAVINA ROUTE

(Thousands of Dollars)

Year	Gas Pipeline Value[1]	Marine Terminal Value[2]	Liquefaction Plant Value[3]	Total Value	Property Taxes[4]
1976	$ 12,593	$ 2,868	$ 19,041	$ 34,502	$ 690
77	23,325	8,265	42,263	73,853	1,477
78	535,945	22,104	287,101	845,150	16,903
79	1,187,239	37,910	637,042	1,862,191	37,244
80	1,576,941	50,555	1,113,605	2,741,101	54,822
81	1,839,543	56,298	1,499,761	3,395,602	67,912
82-90	1,939,213	57,695	1,602,417	3,599,325	71,987

[1]El Paso Alaska Co., Table 2.3-T3.
[2]El Paso Alaska Co., Table 4.3-T2.
[3]El Paso Alaska Co., Table 3.3-T2.
[4]Property taxes at 20 mill rate (current level of state property tax).

Table 14

ESTIMATED CONSTRUCTION AND MINING EMPLOYMENT

GENERATED ON THE POINT GRAVINA ROUTE, BY FACILITY TYPE

CONSTRUCTION EMPLOYMENT

Year	Pipeline[1]	Marine Terminal[2]	Liquefaction Plant[3]	Total
1976	0	0	0	0
77	0	0	0	0
78	1,350	31	100	1,481
79	3,100	86	2,881	6,067
80	3,134	82	4,356	7,572
81	1,500	0	2,838	4,338
82	1,258	0	650	1,908
83	0	0	0	0
84	0	0	0	0
85	0	0	0	0
86-90	0	0	0	0

MINING (OPERATIONS) EMPLOYMENT

Year	Pipeline[4]	Marine Terminal[5]	Liquefaction Plant[6]	Total
1980-90	268	47	309	624

[1]El Paso Alaska Co., p.1.5-29. "Alaska Gas Pipeline Construction Manpower Curve."
[2]El Paso Alaska Co., p.4.3-4. "Alaska Marine Terminal Construction Manpower Curve."
[3]El Paso Alaska Co., p.3.3-4. "LNG Plant Construction Manpower Curve."
[4]El Paso Alaska Co., p.2.3-19. "Alaska Gas Pipeline Manning Table."
[5]El Paso Alaska Co., p.1-9.
[6]El Paso Alaska Co., p.3.3-12. "Alaskan LNG Plant-Contracted Manpower Requirements."

Table 15

ESTIMATED TAXES, CONSTRUCTION EMPLOYMENT,

AND MINING EMPLOYMENT GENERATED BY

PT. GRAVINA ROUTE

Year	Property Taxes[1] $10^3	Production Taxes and Royalties[2] $10^3	Mining Employment:[3] Southcentral	Interior	Fairbanks	Construction Employment:[3] Southcentral	Interior	Fairbanks
1976	$ 690	$ 0	0	0	0	0	0	0
77	1,477	0	0	0	0	0	0	0
78	16,903	0	0	0	0	400	300	800
79	37,244	0	0	0	0	3,700	1,200	1,200
80	54,822	49,656	400	100	100	5,200	1,300	1,100
81	67,912	52,878	400	100	100	3,100	700	500
82	71,987	60,164	400	100	100	900	600	400
83	71,987	76,787	400	100	100	0	0	0
84	71,987	91,904	400	100	100	0	0	0
85	71,987	92,295	400	100	100	0	0	0
86-90	71,987	105,394	400	100	100	0	0	0

[1]Property taxes at current 20 mill rate.

[2]Production taxes at 4 percent of value, royalties at 12.5 percent of value.

[3]All marine terminal and liquefaction plant employment placed in the Southcentral region. Employment based on El Paso Alaska Co., p.3A.4-24, Table 3A.4-5. Southcentral was adjusted from 300 in 1980. Allocation of El Paso's Interior region employment to Interior, Southeast Fairbanks Census Division, and Southcentral was by miles of pipe in each region. Employment for Interior region excluding Fairbanks Census Division from El Paso Alaska Co., p.3A.2-59, Table 3A.2-10, and p.3A.2-56 (Arctic was adjusted from 80 in 1982). Fairbanks Census Division employment was from El Paso Alaska Co., p.3A.3-20, Table 3A.3-12, and p.3A.3-13, Table 3A.3-13. Southeast Fairbanks and Fairbanks Census Divisions comprise the Fairbanks region.

Fairbanks - Haines Route

This route is basically the same as the Fairbanks-Alaska Highway Route until it reaches the Canadian border. It then turns south to Haines, Alaska. This route has more pipeline miles inside Alaska than the Gravina Route and requires the same terminal facilities. Total capital value reaches $4.1 billion in 1982, the assumed year of completion, and yields $82 million in property taxes to the state from then until the end of the decade (Table 16). Employment reaches a maximum in 1980 when nearly 7,800 people are employed in construction in the Southeast, Interior, and Fairbanks Regions combined, and 600-plus are involved in operations, concentrated at the terminal facilities (Tables 17, 18). Throughput is the same as the Point Gravina Route.

Cook Inlet Route

This route is a variation of the Point Gravina Route, which delivers gas to a liquefaction plant on the Cook Inlet side of the Kenai Peninsula. The route is slightly longer than the Point Gravina Route, resulting in more pipe and a maximum capital value of $3.7 billion for the project (Table 19). Annual property taxes rise to $74 million dollars in 1982 and remain there throughout the decade. Employment also reflects the different route, rising to about the same level of 7,600 people but being distributed over four regions -- Southcentral, Anchorage, Interior, and Fairbanks - instead of only three (Tables 20, 21). Throughput is identical to the Point Gravina Route.

Table 16

CUMULATIVE CAPITAL COSTS (VALUE IN PLACE)
AND ESTIMATED PROPERTY TAXES,
FAIRBANKS-HAINES ROUTE

(Thousands of Dollars)

Year	Gas Pipeline Value[1]	Marine Terminal Value[2]	Liquefaction Plant Value[3]	Total Value	Property Taxes[4]
1976	$ 15,835	$ 2,868	$ 19,041	$ 37,744	$ 755
77	29,352	8,265	42,263	79,880	1,598
78	674,312	22,104	287,101	983,517	19,670
79	1,493,773	37,910	637,042	2,168,725	43,375
80	1,984,093	50,555	1,113,605	3,148,253	62,965
81	2,314,478	56,298	1,499,761	3,870,537	77,411
82-90	2,439,888	57,695	1,602,417	4,100,000	82,000

[1]Basis for value is the Point Gravina Route, inflated by a proportion equal to the ratio of the lengths of the lines.

[2]Terminal value was assumed to be the same as that for the Point Gravina Route, due to lack of specific data.

[3]See (2), above.

[4]Property taxes at 20 mill rate (current level of state property tax).

Table 17

ESTIMATED CONSTRUCTION AND MINING EMPLOYMENT
GENERATED ON THE FAIRBANKS-HAINES ROUTE, BY FACILITY TYPE

CONSTRUCTION EMPLOYMENT

Year	Pipeline[1]	Marine Terminal[2]	Liquefaction Plant[3]	Total
1976	0	0	0	0
77	0	0	0	0
78	1,293	31	100	1,424
79	2,969	86	2,881	5,936
80	3,002	82	4,356	7,440
81	1,437	0	2,838	4,275
82	1,205	0	650	1,855
83	0	0	0	0
84	0	0	0	0
85	0	0	0	0
86-90	0	0	0	0

MINING (OPERATIONS) EMPLOYMENT

Year	Pipeline[4]	Marine Terminal[5]	Liquefaction Plant[6]	Total
1980-90	257	47	309	613

[1]Total employment based on the Point Gravina Route, inflated to reflect difference in the length of line.
[2]Marine terminal employment schedule assumed identical to Point Gravina Route. All employment in the Southeast Region.
[3]See (2), above.
[4]See (1), above.
[5]See (2), above.
[6]See (2), above.

Table 18

ESTIMATED TAXES, CONSTRUCTION EMPLOYMENT,
AND MINING EMPLOYMENT GENERATED BY
FAIRBANKS - HAINES ROUTE

Year	Property Taxes[1] $10^3	Production Taxes and Royalties[2] $10^3	Mining Employment:[3] Southeast	Anchorage	Interior	Fairbanks	Construction Employment:[4] Southeast	Interior	Fairbanks
1976	$ 755	$ 0	0	0	0	0	0	0	0
77	1,598	0	0	0	0	0	0	0	0
78	19,670	0	0	0	0	0	131	300	993
79	43,375	0	0	0	0	0	2,967	969	2,000
80	62,965	49,656	356	10	100	147	4,538	967	1,935
81	77,410	52,878	356	10	100	147	2,838	700	737
82	82,000	60,164	356	10	100	147	650	600	605
83	82,000	76,787	356	10	100	147	0	0	0
84	82,000	91,904	356	10	100	147	0	0	0
85	82,000	92,295	356	10	100	147	0	0	0
86-90	82,000	105,394	356	10	100	147	0	0	0

[1]Property taxes at current 20 mill rate.
[2]Production taxes at 4 percent of value, royalties at 12.5 percent of value.
[3]Pipeline operations and maintenance employment allocated by miles of line in each region. Ten supervisory and administrative personnel assigned to the Anchorage area. All marine terminal and liquefaction plant employment assigned to the Southeast.
[4]Pipeline construction employment based on Pt. Gravina Route, inflated and allocated to regions by miles of line. Marine terminal and liquefaction plant construction employment is allocated to the Southeast.

Table 19

CUMULATIVE CAPITAL COSTS (VALUE IN PLACE)
AND ESTIMATED PROPERTY TAXES,
COOK INLET ROUTE

(Thousands of Dollars)

Year	Gas Pipeline Value[1]	Marine Terminal Value[2]	Liquefaction Plant Value[3]	Total Value	Property Taxes[4]
1976	$ 13,239	$ 2,868	$ 19,041	$ 35,148	$ 703
77	24,540	8,265	42,263	75,068	1,501
78	563,764	22,104	287,101	872,969	17,459
79	1,248,881	37,910	637,042	1,923,833	38,477
80	1,658,817	50,555	1,113,605	2,822,977	56,460
81	1,935,038	56,298	1,499,761	3,491,097	69,822
82-90	2,039,888	57,695	1,602,417	3,700,000	74,000

[1]Basis for value is the Point Gravina Route, inflated by a proportion equal to the ratio of the lengths of the lines.

[2]Terminal value was assumed to be the same as that for the Point Gravina Route, due to lack of specific data.

[3]See (2), above.

[4]Property taxes at 20 mill rate (current level of state property tax).

Table 20

ESTIMATED CONSTRUCTION AND MINING EMPLOYMENT
GENERATED ON THE COOK INLET ROUTE, BY FACILITY TYPE

CONSTRUCTION EMPLOYMENT

Year	Pipeline[1]	Marine Terminal[2]	Liquefaction Plant[3]	Total
1976	0	0	0	0
77	0	0	0	0
78	1,418	31	100	1,549
79	3,277	86	2,881	6,244
80	3,293	82	4,356	7,731
81	1,576	0	2,838	4,414
82	1,322	0	650	4,414
83	0	0	0	0
84	0	0	0	0
85	0	0	0	0
86-90	0	0	0	0

MINING (OPERATIONS) EMPLOYMENT

Year	Pipeline[4]	Marine Terminal[5]	Liquefaction Plant[6]	Total
1980-90	282	47	309	638

[1]Total employment based on the Point Gravina Route, inflated to reflect difference in the length of line.
[2]Marine terminal employment schedule assumed identical to Point Gravina Route. All employment in the South Central Region.
[3]See (2), above.
[4]See (1), above.
[5]See (2), above.
[6]See (2), above.

Table 21

ESTIMATED TAXES, CONSTRUCTION EMPLOYMENT,
AND MINING EMPLOYMENT GENERATED BY
COOK INLET ROUTE

Year	Property Taxes[1] 10^3	Production Taxes and Royaltjes[2] 10^3	Mining Employment:[3] Southcentral	Anchorage	Interior	Fairbanks	Construction Employment:[4] Southcentral	Anchorage	Interior	Fairbanks
1976	$ 703	$ 0	0	0	0	0	0	0	0	0
77	1,501	0	0	0	0	0	0	0	0	0
78	17,459	0	0	0	0	0	849	100	300	300
79	38,477	0	0	0	0	0	4,244	400	1,200	400
80	56,460	49,656	453	10	100	75	5,681	400	1,300	350
81	69,822	52,878	453	10	100	75	3,414	200	700	100
82	74,000	60,164	453	10	100	75	1,272	0	600	100
83	74,000	76,787	453	10	100	75	0	0	0	0
84	74,000	91,904	453	10	100	75	0	0	0	0
85	74,000	92,295	453	10	100	75	0	0	0	0
86-90	74,000	105,394	453	10	100	75	0	0	0	0

[1]Property tax at current 20 mill rate.
[2]Production tax at 4 percent of value, royalties at 12.5 percent of value.
[3]Pipeline operations and maintenance employment based on Point Gravina Route, inflated and allocated to regions by miles of line, with 10 supervisory and administrative personnel assigned to Anchorage. All marine terminal and liquefaction plant personnel assigned to Southcentral.
[4]Construction employment assigned on same basis as pipeline maintenance, except one large camp in Anchorage area is assumed to work line in both directions.

Golovin Route

This route follows the Trans-Alaska Pipeline route initially; then it turns abruptly west to cross Alaska and emerge on tidewater at Golovin, to the east of Nome on Norton Sound. Since there is no established surface transportation system in this direction, a highway would probably have to be built. In any event, the value of capital in place subject to state property tax rises to $3.6 billion by 1982, generating $82 million in property taxes annually (Table 22). This is the only route which directly generates employment in the Northwest Region. Total construction employment peaks at around 7,700 average monthly employment in 1980 -- 4,600 in the Northwest, the rest in the Interior (Tables 23, 24). Operations employment requires about 10 people in Anchorage, 400 in the Northwest, and about 200 in the Interior. Throughput is identical to the Point Gravina case.

Table 22

CUMULATIVE CAPITAL COSTS (VALUE IN PLACE)
AND ESTIMATED PROPERTY TAXES,
GOLOVIN ROUTE

(Thousands of Dollars)

Year	Gas Pipeline Value[1]	Marine Terminal Value[2]	Liquefaction Plant Value[3]	Total Value	Property Taxes[4]
1976	$ 12,590	$ 2,868	$ 19,041	$ 34,999	$ 690
77	23,337	8,265	42,263	73,865	1,477
78	536,127	22,104	287,101	845,332	16,907
79	1,187,658	37,910	637,042	1,862,610	37,252
80	1,577,498	50,555	1,113,605	2,741,658	54,833
81	1,840,178	56,298	1,499,761	3,396,237	67,925
82-90	1,939,888	57,695	1,602,417	3,600,000	72,000

[1]Basis for value is the Point Gravina Route, inflated by a proportion equal to the ratio of the lengths of the lines.

[2]Terminal value was assumed to be the same as that for the Point Gravina Route, due to lack of specific data.

[3]See (2), above.

[4]Property taxes at 20 mill rate (current level of state property tax).

Table 23

ESTIMATED CONSTRUCTION AND MINING EMPLOYMENT
GENERATED ON THE GOLOVIN ROUTE, BY FACILITY TYPE

CONSTRUCTION EMPLOYMENT

Year	Pipeline[1]	Marine Terminal[2]	Liquefaction Plant[3]	Total
1976	0	0	0	0
77	0	0	0	0
78	1,252	31	100	1,383
79	2,874	86	2,881	5,841
80	2,905	82	4,356	7,343
81	1,391	0	2,838	4,229
82	1,166	0	650	1,816
83	0	0	0	0
84	0	0	0	0
85	0	0	0	0
86-90	0	0	0	0

MINING (OPERATIONS) EMPLOYMENT

Year	Pipeline[4]	Marine Terminal[5]	Liquefaction Plant[6]	Total
1980-90	248	47	309	604

[1]Total employment based on Point Gravina Route, inflated to reflect difference in the length of the line.
[2]Marine terminal employment schedule assumed identical to Point Gravina Route. All employment in the Northwest Region.
[3]See (2), above.
[4]See (1), above.
[5]See (2), above.
[6]See (2), above.

Table 24

ESTIMATED TAXES, CONSTRUCTION EMPLOYMENT,
AND MINING EMPLOYMENT GENERATED BY
GOLOVIN ROUTE

Year	Property Taxes[1] $10^3	Production Taxes and Royalties[2] $10^3	Mining Employment:[3] Northwest	Anchorage	Interior	Construction Employment:[4] Northwest	Interior
1976	$ 690	$ 0	0	0	0	0	0
77	1,477	0	0	0	0	0	0
78	16,907	0	0	0	0	150	1,233
79	37,252	0	0	0	0	3,000	2,841
80	54,833	49,656	400	10	194	4,600	2,743
81	67,925	52,878	400	10	194	3,000	1,229
82	72,000	60,164	400	10	194	700	1,116
83	72,000	76,787	400	10	194	0	0
84	72,000	91,904	400	10	194	0	0
85	72,000	92,295	400	10	194	0	0
86-90	72,000	105,394	400	10	194	0	0

[1]Property taxes at current 20 mill rate.

[2]Production taxes at 4 percent of value, royalties at 12.5 percent of value.

[3]Pipeline operations and maintenance employment based on Pt. Gravina, inflated and allocated by miles of line, with 10 supervisory and administrative personnel assigned to Anchorage, and marine terminal and liquefaction plant in the Northwest region.

[4]Pipeline construction employment inflated and allocated by miles of line, based on Pt. Gravina schedule. Marine terminal and liquefaction plant construction employment assigned to Northwest.

II. IMPACTS OF THE PIPELINE ROUTES ON THE ALASKAN ECONOMY

A. METHODOLOGY

The primary employment and revenue data supplied by the client were used as inputs for the ISEGR Man in the Arctic Program (MAP) computer simulation model of the Alaskan economy. The model was developed in a program of econometric research on Alaska statewide and regional economic data covering the period since statehood, and uses key exogenous data series on employment in the petroleum and construction industries, together with state revenues from oil and gas leasing and production, to project output, employment, and wages and salaries in each of the state's economic regions. Population, personal income, and state and local revenue and expenditures are projected in special submodels of the main software package. In projecting the path of Alaska's future economic development, an important factor is the very large and uncertain impact of the big increase in state revenues resulting from oil and gas development. The state is assumed to follow a moderate policy with respect to these revenues, saving 25 percent of recurring revenues and 50 percent of lease bonus payments to provide for future demand on its resources.

In comparison with state government and petroleum, the other exogenous sectors are assumed to grow slowly (agriculture, forestry, and fisheries) or not at all (federal government). This points out the importance

of petroleum development as a driving force in the model, since a large proportion of future state revenues is expected to be affected by changes in the path of petroleum development. Since the model was partly developed to measure such impacts, it easily accomodates changes in assumptions regarding natural gas pipelines.

For the purpose of measuring gas pipeline impacts, the computer model was first run under the assumption that no gas pipeline was constructed, while a moderate program of onshore and offshore petroleum was otherwise pursued. Then this case was altered by the added employment and state revenues corresponding to each pipeline route, and the model was run again to get the difference between the results of each pipeline alternative and the no gas pipeline case. The difference between each gas pipeline projection and the no gas pipeline projection was counted as the impact of that route on the Alaskan economy.

B. OVERVIEW OF PIPELINE IMPACTS

Generally speaking, the LNG pipeline alternatives have a greater impact on the Alaskan economy than do the Trans-Canadian alternatives. There are three reasons for this: first, because of the marine terminal and liquefaction plant, the LNG routes are characterized by higher property taxes and state revenues; secondly, because of the marine terminal and liquefaction plant, both construction and mining (petroleum) sector

employment are higher; and finally, because El Paso assumed higher gas production for the Prudhoe Bay field, higher petroleum revenues accrue to the state in the LNG cases.

Using production as the first standard of comparison, the impact on constant dollar gross state product is almost $41 million in the case of either the Prime Route or Onshore (Coastal) Route in the peak construction year, 1980. This falls to about $29 million in 1982, the depth of the post-construction "bust", then grows more moderately to again reach $40 million in 1990. Except in 1980, when the construction boom is at its height, most of the impact occurs in Anchorage even though only a small headquarters staff is located in the area. Comparing the Trans-Canadian routes, the Offshore Route shows an increase of only about $2 million from the Prime Route, while the construction boom is 2.5 times as large in the Interior case, 4.4 times as large in the Fort Yukon case, and 6.1 times as large for the Fairbanks-Alaska Highway alternative. The LNG routes show even bigger impacts. The top of the construction "boom" in the case of the main El Paso route, Point Gravina, shows a gross state product of $396.9 million in 1980, nearly ten times that of the Prime Route. The total "bust" is larger, also with gross product falling to $259.7 million by 1984, followed by a recovery to $286.8 million. In the case of the Fairbanks-Haines alternate, the boom peaks at $292 million, about seven times that offered by the Prime Route, although $100 million less than Point Gravina. However, the recovery to the end of the 1980 decade is stronger, finishing at $353.4 million. The Cook

Inlet Route offers a bigger construction boom and recovery than the Point Gravina Route, although the last reported year's output is some $40 million less than the Fairbanks-Haines alternative. The Golovin alternative shows the largest construction "boom" of any route -- $447.2 million -- but it shows one of the smallest recoveries following the "bust". The 1990 gross state product is $190.8 million in this case.

Employment also follows a boom-bust cycle, rising rapidly as the construction period causes intensive activity along the pipeline corridor and in major support bases, such as Anchorage. Following the post-construction downturn in economic activity, there ensues a steady growth in employment fueled by state spending of petroleum revenues. Because of the concentration of pipeline and terminal facilities in Alaska, and the consequent higher number of jobs available, there is a higher and more exaggerated cycle of employment in all the LNG options than any of the Trans-Canada options. The Arctic Gas Prime Route and Onshore Route both show an impact of about 4.3 thousand jobs during the peak of the construction period and in 1990. Nearly 60 percent of this employment is centered in Anchorage. There is very little difference in the Offshore case. Interior and Fort Yukon show higher construction period employment -- about 2.7 and 3.8 times that of the Prime Route -- but the gap narrows considerably by 1990 because of the more exaggerated downturn following construction. The Fairbanks-Alaska Highway Route is characterized by employment 5.6 times the Prime Route peak in 1980, but this gap declines until the 1990 employment figure for the Fairbanks-Alaska Highway Route

is 1.4 times the Prime Route. The impact in all Trans-Canada cases centers on Anchorage, with over 50 percent of total employment occurring there (except in the peak construction years). The LNG routes have more the impact on state employment. For example, the Point Gravina Route peak employment is 23.8 thousand, which is 5.5 times the Prime Route peak. This difference declines until the ratio of peak employment is 2.9 in 1990. The total is approximately the same for the Fairbanks-Haines, Cook Inlet, and Golovin Routes, and all show over 50 percent of employment centered in Anchorage. During peak construction years, however, a one-time boom occurs in the regions containing pipeline facilities, and this spreads employment more evenly. In summary, only the Fairbanks-Alaska Highway Route has an impact approaching any of the various LNG proposals.

In response to increased employment opportunities, workers migrate into the state which increases total population. Again, most of this growth is expected to occur in the existing urban centers of the state -- Anchorage and Fairbanks. The range of the increase in population among the various alternatives is very great. The Arctic Gas Prime Route increases the state population by 8,600 people in 1990, while the Point Gravina Route increases it by 32,800 at the peak of the boom and by nearly 28,000 in 1990. The other Trans-Canada Routes show impacts ranging from 9,100 people in the Offshore case in 1990 to 15,300 in the Fairbanks-Alaska Highway case. The other Trans-Canada routes show more of a boom-bust cycle than the Prime Route -- e.g., Fairbanks-Alaska Highway peak population impact is 33.4 thousand persons in 1980. The other LNG routes

show ultimate impacts of about the same magnitude and distribution as the Point Gravina Route. The transient population impact of the construction boom is somewhat different in each case, however, since employment is centered on the gas facilities themselves in 1979-1981. In all cases, not surprisingly, population impact occurs in the existing urban centers. There is some induced depopulation of areas of the state not directly impacted by the pipeline in all the LNG cases. This is due to the construction boom, and is a temporary phenomenon. All regions eventually have positive population impacts in all cases.

The increased population dissipates many of the supposed benefits of pipeline construction and operation. Indeed, the population influx is great enough in several cases to cause a net decrease in per capita personal income, compared to the case in which no gas pipeline is built. Nor is the effect universal. In most cases, per capita income increases tended to center in only about half the regions of the state, while induced immigration to Alaska's Southcentral, Anchorage, and Southeast Regions tended to reduce income per capita there. In no case was there a large increase in income for the "average" Alaskan, even though there were substantial increases in total personal incomes earned over the period. The effects of inflation make even the small overall increases in per capita personal income inconsequential.

It was pointed out earlier that one of the principal driving forces in the Alaskan economy is the very large expected increase in the level of state and local expenditures for public services. However, while

total spending increases by $98.2 million in the case of the Prime Route, and by $238.8 million in the Point Gravina case, for example, the corresponding per capita terms in 1990 are only $67 for the Prime Route and $107 for the Point Gravina Route. Adjusted for the expected increase in prices between 1976 and 1990, the change in real per capita expenditures is only 1.6 - 2.6 percent. Once again, immigration dissipates an apparent benefit of development, the possibility of increased services. The benefits are largest for the LNG proposals, but so is the population increase, which dissipates the gains. Similar phenomena occur in the other cases, as can be seen from Table 25. The per capita figures on state expenditures also point out the strain which the large employment cases place on fiscal resources of the state. The influx of population is so large in 1978-79 that between 1976 and 1979, even with increased total spending ranging from $6.6 million for the Prime Route to $38.7 million for the Point Gravina Route, expenditures per capita fell in most cases. Thus, a decline in the availability of public services is expected during the construction period.

Table 25

PER CAPITA STATE EXPENDITURES
IMPACTS (Dollars)

Year	Prime and Onshore Routes	Offshore Route	Interior Route	Ft. Yukon Route	Fairbanks-Alaska Hwy. Route	Fairbanks-Haines Route	Pt. Gravina Route	Cook Inlet Route	Golovin Route
1976	1.1	1.1	2.1	2.8	4.3	1.7	1.5	1.5	1.5
77	2.5	3.2	4.9	5.7	7.7	3.3	3.5	3.5	3.5
78	4.8	6.1	7.2	7.2	10.3	7.7	3.8	4.2	4.2
79	2.4	4.5	- 14.7	- 31.4	- 46.9	- 25.9	- 35.1	- 36.7	- 39.2
80	83.6	86.3	65.8	46.4	34.0	42.4	30.6	28.9	29.9
81	104.1	103.8	129.8	147.9	182.4	207.4	118.0	117.7	124.7
82	88.5	171.4	93.5	93.8	103.7	142.9	118.5	121.4	116.0
83	89.0	98.3	86.8	82.9	86.7	135.0	133.5	134.5	121.5
84	84.2	87.6	80.8	76.1	78.3	138.4	117.1	117.7	99.8
85	79.9	81.7	76.9	72.5	74.6	131.7	106.1	106.7	88.1
86	76.1	77.4	73.8	70.0	73.6	136.2	110.6	110.9	93.4
87	73.3	74.5	72.1	69.1	73.2	134.6	110.3	110.5	94.5
88	71.1	72.3	70.9	68.8	73.6	131.6	109.0	109.1	94.6
89	69.0	70.4	69.8	68.4	74.0	128.5	107.5	107.5	94.6
90	67.4	68.8	69.1	68.4	74.8	126.6	106.9	106.9	95.5

C. PIPELINE IMPACTS BY ROUTE

Arctic Gas Prime Route

The Arctic Gas Prime Route has the least economic impact on Alaska of any of the possible routes. Because of the far northern location of the route, it was assumed that construction would take place out of work camps in the northeastern corner of the state, with general support for the operation provided out of Fairbanks. Because all economic development in the state affects Anchorage, the commercial center, and Juneau, the current governmental center, there are impacts in these areas as well.

Beginning in 1976, there is property available on site to be taxed which generates state and/or local government revenue. When part of these revenues are spent, and in anticipation of future development, economic activity begins to increase. Table 26 shows that this happens slowly at first, then accelerates as construction activity increases through 1978-80. This construction boom has an impact of $18.2 million value added in goods and services in the Interior Region during 1980, the peak year. The construction boom touches off permanent growth in the support centers of Anchorage and Fairbanks and in all areas where government revenues are spent. By 1980, the state has an additional $41 million gross product being generated. The growth in Anchorage is almost as large as Interior's and proves to be far more permanent. Other areas mirror the boom and bust in Interior but in a more moderate manner. As production begins, the state spends three-fourths of the recurrent revenues, and gross

Table 26

ONSHORE ROUTE, PRIME ROUTE
IMPACT ON REAL GROSS PRODUCT BY REGION AND YEAR[1]
Millions of 1958 Dollars

YEAR	NORTHWEST	SOUTHWEST	SOUTHEAST	SOUTHCENTRAL	ANCHORAGE	INTERIOR	FAIRBANKS	TOTAL
1976	*[2]	*	*	*	0.1	*	*	0.2
77	*	*	0.1	*	0.4	0.6	0.1	1.2
78	*	*	0.2	0.1	1.2	2.3	0.1	4.0
79	0.1	0.1	0.4	0.3	3.6	9.8	0.3	14.4
80	0.8	0.5	2.4	1.7	14.8	18.2	2.3	40.7
81	1.0	0.7	3.0	2.1	15.0	5.8	2.9	30.6
82	1.0	0.6	2.7	1.9	14.2	5.7	2.7	28.9
83	1.1	0.6	2.8	2.0	15.2	5.6	2.8	30.1
84	1.1	0.7	2.8	2.0	16.0	5.5	2.9	30.9
85	1.1	0.7	2.8	2.0	16.7	5.6	3.0	31.9
86	1.1	0.7	2.8	2.0	17.6	5.6	3.1	32.9
87	1.2	0.7	2.8	2.1	18.6	5.7	3.2	34.3
88	1.3	0.8	2.8	2.1	19.8	5.8	3.3	35.9
89	1.4	0.8	2.9	2.2	21.3	5.8	3.4	37.7
90	1.5	0.8	2.9	2.2	23.0	5.8	3.6	39.9

[1] Impacts are measured as deviations from the situation in which no gas pipeline is built.

[2] * = less than 50 thousand dollars.

product of all areas of the state receiving this spending grows steadily, the impact reaching almost $40 million annually by 1990. Fifty-eight percent of the final year's gross product is produced in the Anchorage area and only 14.5 percent in Interior, the original construction site.

Employment follows a similar pattern, as can be seen in Tables 27 and 28. In the Alaskan economy, growth in the exogenous sectors of mining, construction, and state government induces larger growth in the support sectors of transportation, communications, public utilities, trade, services, and financial institutions. For example, even in the boom year of 1980, eighteen hundred of the additional 4,300 wage earners in the state are support sector workers, while 1,400 are in government and only 721 are directly employed in the pipeline project (see Section I , Table 2). Employment reflects this pattern regionally as well. In 1980, as many additional workers are required in Anchorage as in Interior and Fairbanks combined. In the longer run, the impact of 4,300 additional workers in 1990 is felt much more heavily in Anchorage than in Fairbanks or Interior, the former getting 58 percent of 1990 employment.

Additional employment generates additional population growth, as in-migrants arrive in Alaska to compete for construction jobs, but in addition, to supply the services needed by a growing state economy. Total population does follow a cycle, but a more moderate one than employment. While employment declines by 16 percent after the construction boom and before resuming a state revenue-induced growth, population only declines three percent, all the decline showing up in the Interior Region. The support centers actually show population increases in the face of slowly declining employment

Table 27

ONSHORE ROUTE, PRIME ROUTE
IMPACT ON EMPLOYMENT BY REGION AND YEAR[1]
Thousands of Persons

YEAR	NORTHWEST	SOUTHWEST	SOUTHEAST	SOUTHCENTRAL	ANCHORAGE	INTERIOR	FAIRBANKS	TOTAL
1976	*[2]	*	*	*	*	*	*	*
77	*	*	*	*	*	0.1	*	0.1
78	*	*	*	*	0.1	0.2	*	0.4
79	0.1	*	0.1	*	0.3	1.0	*	1.5
80	0.1	0.1	0.5	0.3	1.6	1.3	0.3	4.3
81	0.1	0.1	0.7	0.4	1.8	0.1	0.4	3.6
82	0.1	0.1	0.6	0.4	1.7	0.1	0.4	3.3
83	0.1	0.1	0.6	0.4	1.8	0.1	0.4	3.5
84	0.1	0.1	0.6	0.4	1.8	0.1	0.4	3.5
85	0.1	0.1	0.6	0.4	1.9	0.1	0.4	3.6
86	0.1	0.1	0.6	0.4	2.0	0.1	0.4	3.7
87	0.1	0.1	0.6	0.4	2.1	0.1	0.4	3.8
88	0.1	0.1	0.6	0.4	2.2	0.1	0.4	3.9
89	0.1	0.1	0.6	0.4	2.3	0.1	0.4	4.1
90	0.1	0.1	0.6	0.4	2.5	0.1	0.4	4.3

[1] Impacts are measured as deviations from the situation in which no gas pipeline is built.

[2] * = less than 50 persons.

Table 28

ONSHORE ROUTE, PRIME ROUTE
IMPACT ON EMPLOYMENT BY INDUSTRY AND YEAR[1]
Thousands of Persons

YEAR	AGRICULTURE, FORESTRY, & FISHERIES	MINING	CONSTRUCTION	MANUFACTURING	TRANSPORTATION, COMMUNICATION, AND UTILITIES	TRADE	FINANCE, INSURANCE, REAL ESTATE	SERVICE	GOVERNMENT[3]	OTHER	TOTAL
1976	0	0	*[2]	0	*	*	*	*	*	*	*
77	0	0	*	0	*	*	*	*	*	*	0.1
78	0	0	0.1	0	*	0.1	*	0.1	0.1	*	0.5
79	0	0	0.6	0	0.1	0.3	*	0.3	0.2	0.1	1.5
80	0	*	0.8	0	0.2	0.7	0.1	0.8	1.4	0.2	4.3
81	0	*	0.2	0	0.2	0.5	0.1	0.6	1.7	0.3	3.6
82	0	*	0.2	0	0.2	0.5	0.1	0.6	1.6	0.2	3.3
83	0	*	0.2	0	0.2	0.5	0.1	0.6	1.6	0.2	3.5
84	0	*	0.2	0	0.2	0.5	0.2	0.6	1.6	0.2	3.5
85	0	*	0.2	0	0.2	0.5	0.2	0.7	1.6	0.2	3.6
86	0	*	0.2	0	0.2	0.6	0.2	0.7	1.6	0.3	3.7
87	0	*	0.2	0	0.2	0.6	0.2	0.8	1.5	0.3	3.8
88	0	*	0.2	0	0.2	0.6	0.2	0.8	1.5	0.3	3.9
89	0	*	0.2	0	0.2	0.7	0.2	0.9	1.6	0.3	4.1
90	0	*	0.2	0	0.2	0.7	0.2	1.0	1.6	0.3	4.3

[1] Impacts are measured as deviations from the situation in which no gas pipeline is built.

[2] * = less than 50 persons. Equals 39 persons from 1980-1990 for mining.

[3] All the difference from the no gas case is in state and local government employment.

in the early 1980's, which will exacerbate the unemployment problem somewhat. Interior's declining employment opportunities coincide with a rapid outmigration, reflecting the transitory nature of the construction project. Population grows throughout the 1980's in all regions, and the eventual statewide impact is 8,600 people, of which nearly 63 percent live in Anchorage.

The population growth in support areas tends to dissipate many of the gains of economic development. Table 29 shows large increases in total real wages and salaries paid, especially in Anchorage, which shows additional payrolls in real terms of nearly $20 million per year. While Table 32 confirms an increase in total personal incomes, however, it also shows that the large increase in relatively low-paid support sector workers and their families actually reduces per capita income in Anchorage and the surrounding Southcentral Region. Interior, because of its thin population, the high pay of immigrants, and the low income of much of its current population, shows substantial increases in per capita income. Moreover, some of these gains are retained, in contrast with the state as a whole. Taken as a whole, people in the state gain little or nothing in additional personal income. Of course, since there are many additional persons earning on average the same income, there are opportunities for individuals to gain substantially. The MAP model, as currently constructed, is silent about this aspect of income distribution.

Table 29

ONSHORE ROUTE, PRIME ROUTE
IMPACT ON REAL WAGES AND SALARIES PAID BY REGION AND YEAR[1]
Millions of 1967 Dollars

YEAR	NORTHWEST	SOUTHWEST	SOUTHEAST	SOUTHCENTRAL	ANCHORAGE	INTERIOR	FAIRBANKS	TOTAL
1976	*[2]	*	0.1	*	*	*	*	0.2
77	*	*	0.1	0.1	0.3	0.7	0.1	1.2
78	*	0.1	0.3	0.1	0.8	2.6	0.1	4.1
79	0.1	0.1	0.6	0.3	2.2	10.9	0.3	14.5
80	0.6	0.7	3.7	2.1	11.1	14.0	2.6	34.8
81	0.8	0.9	4.8	2.7	12.6	0.8	3.3	25.8
82	0.7	0.8	4.3	2.5	11.9	0.8	3.6	24.1
83	0.7	0.9	4.6	2.5	12.8	0.8	3.1	25.5
84	0.7	0.9	4.6	2.6	13.5	0.9	3.3	26.5
85	0.8	0.9	4.8	2.6	14.1	0.8	3.4	27.5
86	0.8	0.9	4.9	2.8	14.9	0.9	3.4	28.6
87	0.8	1.0	5.0	2.8	15.7	1.0	3.5	29.7
88	0.9	1.0	5.1	2.9	16.9	1.0	3.7	31.3
89	0.9	1.1	5.3	3.0	18.1	1.0	3.9	33.1
90	0.9	1.1	5.5	3.2	19.6	1.0	3.9	35.2

[1] Impacts are measured as deviations from the situation in which no gas pipeline is built.

[2] * = less than 50 thousand dollars difference.
Regions may not sum to total due to rounding errors.

Table 30

ONSHORE ROUTE, PRIME ROUTE
IMPACT ON POPULATION BY REGION AND YEAR[1]
Thousands of Persons

YEAR	NORTHWEST	SOUTHWEST	SOUTHEAST	SOUTHCENTRAL	ANCHORAGE	INTERIOR	FAIRBANKS	TOTAL
1976	0	0	*	*	*	0	*	*
77	*[2]	*	*	*	0.1	*	*	0.2
78	*	*	0.1	0.1	0.3	0.1	*	0.6
79	*	0.1	0.2	0.2	0.9	0.5	0.2	2.0
80	0.1	0.1	0.7	0.8	3.0	0.6	0.5	5.8
81	0.1	0.1	0.8	0.9	3.1	*	0.6	5.6
82	0.1	0.1	0.8	0.9	3.1	0.1	0.6	5.6
83	0.1	0.1	0.8	1.0	3.4	0.1	0.6	6.1
84	0.1	0.1	0.9	1.0	3.7	0.1	0.7	6.5
85	0.1	0.1	0.9	1.0	3.9	0.1	0.7	6.8
86	*	0.1	0.9	1.0	4.2	0.1	0.7	7.1
87	0.1	0.1	0.9	1.1	4.4	0.1	0.7	7.5
88	0.1	0.1	0.9	1.1	4.7	0.1	0.8	7.8
89	0.1	0.1	0.9	1.1	5.0	0.1	0.8	8.2
90	0.1	0.1	1.0	1.2	5.4	0.1	0.8	8.6

[1] Impacts are measured as deviations from the situation in which no gas pipeline is built.

[2] * = less than 50 persons.

Table 31

ONSHORE ROUTE, PRIME ROUTE
IMPACT ON STATE AND LOCAL REVENUES AND EXPENDITURES[1]
Millions of Dollars

YEAR	STATE TOTAL	PETROLEUM REVENUES	PERSONAL AND CORPORATE INCOME TAX	INTEREST INCOME	SPECIAL FUND REVENUE	OTHER GENERAL FUND REVENUE	LOCAL GOV'T REVENUE FROM OWN SOURCES	STATE AND LOCAL GOV'T REVENUE	STATE AND LOCAL GOV'T EXPENDITURES
1976	0.5	0.5	0	0	0	0	0	0.5	0.5
77	1.3	1.3	0	0	0	0	0	1.3	1.4
78	4.5	4.1	0.1	0	0.1	0.2	0.5	5.0	3.9
79	9.0	7.4	0.6	0.1	0.3	0.6	1.5	10.5	8.5
80	76.0	70.1	2.1	0.2	1.3	2.2	6.0	82.0	64.3
81	86.3	70.1	5.6	1.4	3.6	5.6	16.3	102.6	84.8
82	85.6	71.3	4.4	2.6	2.9	4.4	12.9	98.5	80.3
83	93.2	77.7	4.3	3.9	3.0	4.4	14.3	107.5	86.7
84	96.2	77.7	5.0	5.3	3.5	4.8	15.6	111.8	91.7
85	99.0	77.7	5.5	6.6	4.0	5.2	17.7	116.7	96.5
86	102.1	77.7	6.2	7.9	4.6	5.7	20.2	122.3	101.9
87	105.4	77.7	6.9	9.3	5.2	6.3	23.1	128.5	108.0
88	109.0	77.7	7.6	10.7	6.0	6.9	16.5	125.5	114.7
89	113.1	77.7	8.6	12.0	7.0	7.7	30.8	143.9	122.7
90	117.6	77.7	8.8	13.4	8.1	8.5	35.8	153.4	132.0

[1] Impacts are measured as deviations from the situation in which no gas pipeline is built.

Table 32

ONSHORE ROUTE, PRIME ROUTE
IMPACT ON PERSONAL INCOME AND PER CAPITA INCOME BY REGION AND YEAR[1]
Personal Income in Millions of Dollars, Per Capita Income in Dollars

	NORTHWEST		SOUTHWEST		SOUTHEAST		SOUTHCENTRAL		ANCHORAGE		INTERIOR		FAIRBANKS		TOTAL	
YEAR	PERSONAL INCOME	PER CAPITA INCOME	PERSONAL INCOME	PER CAPITA INCOME	PERSONAL INCOME	PER CAPITA INCOME	PERSONAL INCOME	PER CAPITA INCOME	PERSONAL INCOME	PER CAPITA INCOME	PERSONAL INCOME	PER CAPITA INCOME	PERSONAL INCOME	PER CAPITA INCOME	PERSONAL INCOME	PER CAPI INCOM
1976	0	0	0	0	0.1	0	0.1	1	0.2	1	0	0	0.1	1	0.4	0
77	0	- 1	0	0	0.1	- 2	0.1	- 1	0.5	- 1	2.3	184	0.1	0	3.1	5
78	0	- 3	0	- 3	0.3	- 7	0.2	- 6	1.2	- 6	8.8	683	0.2	- 4	10.8	14
79	0	- 12	- 0.3	- 24	0.1	- 34	0	- 31	2.2	- 31	37.8	2,915	- 0.2	- 29	39.7	47
80	0.7	11	1.2	20	9.2	7	6.2	- 21	26.1	- 17	50.7	3,811	5.9	6	100.0	67
81	2.1	52	2.4	63	14.3	59	9.7	17	35.9	22	3.2	245	9.9	54	76.8	38
82	1.4	42	2.4	54	13.7	44	9.2	8	35.1	11	3.3	222	9.5	41	74.5	26
83	1.5	40	2.6	53	14.8	38	10.0	5	39.1	5	3.4	217	10.3	37	81.7	20
84	1.6	41	2.9	55	15.6	31	10.6	1	43.0	1	3.6	232	11.0	33	88.1	15
85	1.7	40	3.0	49	16.5	25	11.3	- 2	46.6	- 4	3.8	231	11.7	29	94.7	11
86	1.9	47	3.2	49	17.6	22	12.0	- 4	50.9	- 8	4.1	243	12.5	26	102.0	7
87	2.0	47	3.5	50	18.6	18	12.7	- 7	56.1	- 10	4.3	242	13.4	25	110.6	5
88	2.1	45	3.7	49	19.8	17	13.7	- 7	62.1	- 13	4.6	249	14.4	25	120.6	1
89	2.3	49	4.1	55	21.4	18	14.7	- 9	69.3	- 15	4.9	259	15.5	24	132.2	0
90	2.6	60	4.4	58	23.1	19	16.0	- 9	78.0	- 16	5.3	283	16.9	26	146.2	0

[1] Impacts are measured as deviations from the situation in which no gas pipeline is built.

Onshore Route

Since the totals and regional distributions of all exogenous economic variables were identical in this case to those of the Prime Route, the MAP model gives identical economic impacts.

Offshore Route

The impact of the Offshore Route on the Alaskan economy is very similar to the Prime Route in both size and distribution. The major difference is the capital value of facilities, implying larger state petroleum revenues, and slightly greater impacts on gross product, employment, population, and personal incomes.

Gross product follows much the same pattern as the Prime Route, peaking somewhat later for the construction period, but ultimately showing about the same sized impact. In the peak construction year, 1980, Interior shows the same impact of $18.2 million in gross product generated as in the Prime Route case. The impact on Anchorage is only slightly larger than the Prime case -- $15.1 million. State spending begins in earnest after the gas starts flowing, and this spending offsets the decline in construction activity initially. By 1990, state spending has induced enough activity to offset the "bust" following the construction period, and state real gross product again rises to $41 million. In this longer run case, the impact of growth is felt most heavily in Anchorage, which again has 58 percent of the additional product due to the pipeline development.

Table 33

OFFSHORE ROUTE
IMPACT ON REAL GROSS PRODUCT BY REGION AND YEAR[1]
Millions of 1958 Dollars

YEAR	NORTHWEST	SOUTHWEST	SOUTHEAST	SOUTHCENTRAL	ANCHORAGE	INTERIOR	FAIRBANKS	TOTAL
1976	*[2]	*	*	*	0.1	*	*	0.2
77	*	*	0.1	0.1	0.4	0.6	0.1	1.3
78	0.1	*	0.2	0.1	1.3	2.3	0.2	4.2
79	0.1	0.1	0.4	0.3	3.8	9.8	0.4	14.8
80	0.8	0.5	2.5	1.8	15.1	18.2	2.4	41.2
81	1.0	0.7	3.1	2.2	15.3	5.8	3.0	31.1
82	1.7	1.0	4.5	3.2	23.0	5.9	4.5	43.9
83	1.3	0.8	3.4	2.4	18.3	5.6	3.5	35.2
84	1.2	0.7	3.0	2.2	17.4	5.5	3.2	33.2
85	1.2	0.7	2.9	2.1	17.7	5.6	3.2	33.4
86	1.2	0.7	2.9	2.1	18.4	5.6	3.2	34.2
87	1.3	0.8	2.9	2.2	19.4	5.7	3.3	35.5
88	1.3	0.8	2.9	2.2	20.6	5.9	3.4	37.2
89	1.4	0.8	3.0	2.2	22.1	5.9	3.6	39.0
90	1.5	0.9	3.0	2.3	23.9	5.8	3.8	41.2

[1] Impacts are measured as deviations from the situation in which no gas pipeline is built.

[2] * = less than 50 thousand dollars.

Employment follows a similar pattern of rapidly increasing during the construction phase, turning downward sharply in construction areas and slowly in support areas, then finishing the 1980's with a period of steady growth. The peak construction year, 1980, shows total employment impacts of 4,400 persons, of which 1,800 are in support sectors and 1,400 in government (Table 34). Regionally, Anchorage shows the same short run impact as Interior and Fairbanks combined (Table 35). By the year 1990, the effects on Anchorage again clearly dominate those of other regions.

The effect on wages and salaries paid is not particularly surprising. The expansion of the regional totals shown in Table 36 reflects the boom and bust in Interior, together with support industry and government growth in the Southeast, Southcentral, Anchorage, and Fairbanks regions. As would be expected, Anchorage dominates the picture except in the peak construction years. In 1979 and 1980, the high salaries of oil and gas construction workers in the Interior Region cause wages and salaries to be very large relative to the state totals during the construction period.

In accordance with changes in the level of wages and salaries, personal incomes increase by about $100 million in real terms during the construction period, decline during the post-construction downturn, then increase during the remainder of the 1980's to reach a peak 50 percent higher than the construction boom. (See Table 37) However, as with the Onshore and Prime Routes, the Offshore Route shows a population influx in response to new employment opportunities which dissipates the per capita income

Table 34

OFFSHORE ROUTE
IMPACT ON EMPLOYMENT BY INDUSTRY AND YEAR[1]
Thousands of Persons

YEAR	AGRICULTURE, FORESTRY, & FISHERIES	MINING	CONSTRUCTION	MANUFACTURING	TRANSPORTATION, COMMUNICATION, AND UTILITIES	TRADE	FINANCE, INSURANCE, REAL ESTATE	SERVICE	GOVERNMENT	OTHER	TOTAL
1976	0	0	*[2]	0	*	*	*	*	*	*	*
77	0	0	*	0	*	*	*	*	*	*	0.2
78	0	0	0.1	0	*	0.1	*	0.1	0.1	*	0.5
79	0	0	0.6	0	0.1	0.3	*	0.3	0.2	*	1.6
80	0	*	0.8	0	0.2	0.7	0.1	0.8	1.4	0.2	4.4
81	0	*	0.2	0	0.2	0.5	0.1	0.6	1.8	0.2	3.7
82	0	*	0.3	0	0.3	0.8	0.2	0.9	2.6	0.4	5.5
83	0	*	0.2	0	0.2	0.6	0.2	0.7	1.9	0.3	4.2
84	0	*	0.2	0	0.2	0.6	0.2	0.7	1.7	0.3	3.9
85	0	*	0.2	0	0.2	0.6	0.2	0.7	1.7	0.3	3.8
86	0	*	0.2	0	0.2	0.6	0.2	0.8	1.6	0.3	3.9
87	0	*	0.2	0	0.2	0.6	0.2	0.8	1.6	0.3	4.0
88	0	*	0.2	0	0.2	0.7	0.2	0.9	1.6	0.3	4.1
89	0	*	0.2	0	0.2	0.7	0.2	0.9	1.6	0.3	4.3
90	0	*	0.2	0	0.2	0.7	0.2	1.0	1.6	0.3	4.5

[1] Impacts are measured as deviations from the situation in which no gas pipeline is built.

[2] * = less than 50 persons.

Table 35

OFFSHORE ROUTE
IMPACT ON EMPLOYMENT BY REGION AND YEAR[1]
Thousands of Persons

YEAR	NORTHWEST	SOUTHWEST	SOUTHEAST	SOUTHCENTRAL	ANCHORAGE	INTERIOR	FAIRBANKS	TOTAL
1976	*[2]	*	*	*	*	*	*	*
77	*	*	*	*	*	0.1	*	0.2
78	*	*	*	*	0.1	0.2	*	0.5
79	*	*	0.1	0.1	0.3	1.0	0.1	1.6
80	0.1	0.1	0.5	0.3	1.6	1.3	0.3	4.4
81	0.1	0.1	0.7	0.4	1.8	0.1	0.4	3.7
82	0.2	0.2	1.0	0.6	2.8	0.1	0.6	5.5
83	0.1	0.1	0.7	0.4	2.1	0.1	0.5	4.2
84	0.1	0.1	0.7	0.4	2.0	0.1	0.4	3.9
85	0.1	0.1	0.6	0.4	2.0	0.1	0.4	3.8
86	0.1	0.1	0.6	0.4	2.1	0.1	0.4	3.9
87	0.1	0.1	0.6	0.4	2.2	0.1	0.4	4.0
88	0.1	0.1	0.6	0.4	2.3	0.1	0.4	4.1
89	0.1	0.1	0.6	0.4	2.4	0.1	0.4	4.3
90	0.1	0.1	0.7	0.4	2.6	0.1	0.4	4.5

[1] Impacts are measured as deviations from the situation in which no gas pipeline is built.

[2] * = less than 50 persons.

Table 36

OFFSHORE ROUTE
IMPACT ON REAL WAGES AND SALARIES PAID BY REGION AND YEAR[1]
Millions of 1967 Dollars

YEAR	NORTHWEST	SOUTHWEST	SOUTHEAST	SOUTHCENTRAL	ANCHORAGE	INTERIOR	FAIRBANKS	TOTAL
1976	0	0	0.1	0	0	0	0	0.2
77	0	0	0.1	0.1	0.3	0.7	0.1	1.3
78	0	0.1	0.3	0.1	0.9	2.6	0.2	4.3
79	0.1	0.1	0.6	0.3	2.4	10.9	0.4	14.8
80	0.6	0.8	3.8	2.2	11.4	14.0	2.7	35.3
81	0.8	0.9	4.9	2.8	12.9	0.8	3.4	26.4
82	1.2	1.3	7.3	4.1	19.7	1.0	5.0	39.7
83	0.9	1.1	5.6	3.1	15.5	0.9	3.8	30.9
84	0.8	1.0	5.1	2.9	14.7	0.9	3.6	29.0
85	0.8	0.9	5.1	2.9	14.9	0.9	3.6	29.1
86	0.8	1.0	5.1	2.9	15.6	0.9	3.6	29.9
87	0.8	1.0	5.2	3.0	16.4	1.0	3.7	31.0
88	0.9	1.0	5.3	3.0	17.6	1.0	3.8	32.6
89	0.9	1.1	5.5	3.1	18.8	1.0	4.0	34.4
90	1.0	1.1	5.7	3.3	20.4	1.0	4.1	36.6

[1] Impacts are measured as deviations from the situation in which no gas pipeline is built.

Table 37

OFFSHORE ROUTE
IMPACT ON PERSONAL INCOME AND PER CAPITA INCOME BY REGION AND YEAR[1]
Personal Income in Millions of Dollars, Per Capita Income in Dollars

	NORTHWEST		SOUTHWEST		SOUTHEAST		SOUTHCENTRAL		ANCHORAGE		INTERIOR		FAIRBANKS		TOTAL	
YEAR	PERSONAL INCOME	PER CAPITA INCOME	PERSONAL INCOME	PER CAPITA INCOME	PERSONAL INCOME	PER CAPITA INCOME	PERSONAL INCOME	PER CAPITA INCOME	PERSONAL INCOME	PER CAPITA INCOME	PERSONAL INCOME	PER CAPITA INCOME	PERSONAL INCOME	PER CAPITA INCOME	PERSONAL INCOME	PER CAPI INCOME
1976	0	0	0	0	0.1	1	0.1	1	0.2	1	0	0	0.1	1	0.4	0
77	0	- 1	0	0	0.2	0	0.1	- 2	0.6	0	2.4	196	0.1	0	3.4	5
78	0	- 3	0	- 3	0.4	- 6	0.3	- 6	1.5	- 6	8.8	683	0.3	- 3	11.3	14
79	0	- 12	- 0.2	- 21	0.3	- 33	0.1	- 32	2.7	- 30	37.9	2,925	- 0.1	- 29	40.7	48
80	0.8	16	1.2	20	9.5	8	6.4	- 21	26.8	- 17	50.8	3,821	6.1	7	101.5	83
81	1.4	51	2.5	66	14.7	61	9.9	16	36.7	22	3.2	245	10.1	55	78.5	39
82	2.3	87	4.0	108	22.8	98	15.4	32	58.2	39	4.1	315	15.8	90	122.5	62
83	1.8	48	3.2	67	18.0	48	12.2	8	47.4	8	3.7	236	12.5	47	98.8	26
84	1.8	43	3.1	54	17.1	29	11.6	- 3	46.7	- 3	3.8	237	12.1	32	96.3	13
85	1.8	38	3.1	45	17.5	20	12.0	- 6	49.3	- 9	3.9	225	12.4	25	100.2	6
86	2.0	45	3.4	47	18.4	15	12.6	- 9	53.3	- 13	4.1	228	13.2	23	106.8	2
87	2.1	45	3.6	45	19.5	13	13.3	- 11	58.5	- 16	4.4	236	14.0	21	115.4	- 1
88	2.2	44	3.8	45	20.7	12	14.3	- 12	64.7	- 18	4.7	243	15.0	20	125.6	- 4
89	2.4	49	4.2	51	22.3	13	15.3	- 13	72.2	- 20	5.0	256	16.2	21	137.6	- 5
90	2.7	59	4.5	54	24.1	15	16.7	- 12	81.2	- 20	5.4	279	17.6	23	152.1	- 4

[1] Impacts are measured as deviations from the situation in which no gas pipeline is built.

Table 38

OFFSHORE ROUTE
IMPACT ON POPULATION BY REGION AND YEAR[1]
Thousands of Persons

YEAR	NORTHWEST	SOUTHWEST	SOUTHEAST	SOUTHCENTRAL	ANCHORAGE	INTERIOR	FAIRBANKS	TOTAL
1976	0	0	*[2]	*	*	0	*	*
77	*	*	*	*	0.1	*	*	0.2
78	*	*	0.1	0.1	0.3	0.1	0.1	0.6
79	*	0.1	0.2	0.2	0.9	0.5	0.2	2.1
80	0.1	0.1	0.7	0.8	3.1	0.6	0.5	5.9
81	0.1	0.1	0.8	1.0	3.2	*	0.6	5.7
82	0.1	0.1	1.2	1.4	4.7	*	0.9	8.3
83	0.1	0.1	1.0	1.2	4.1	0.1	0.8	7.3
84	0.1	0.1	1.0	1.1	4.1	0.1	0.8	7.3
85	0.1	0.1	1.0	1.1	4.3	0.1	0.8	7.4
86	0.1	0.1	1.0	1.1	4.5	0.1	0.8	7.7
87	0.1	0.1	1.0	1.2	4.7	0.1	0.8	8.0
88	0.1	0.2	1.0	1.2	5.0	0.1	0.8	8.4
89	0.1	0.2	1.0	1.2	5.3	0.1	0.8	8.7
90	0.1	0.2	1.0	1.2	5.7	0.1	0.8	9.1

[1] Impacts are measured as deviations from the situation in which no gas pipeline is built.

[2] * = less than 50 persons.
Regions may not sum to total due to rounding errors.

Table 39

OFFSHORE ROUTE
IMPACT ON STATE AND LOCAL REVENUES AND EXPENDITURES[1]
Millions of Dollars

YEAR	STATE TOTAL	PETROLEUM REVENUES	PERSONAL AND CORPORATE INCOME TAX	INTEREST INCOME	SPECIAL FUND REVENUE	OTHER GENERAL FUND REVENUE	LOCAL GOV'T REVENUE FROM OWN SOURCES	STATE AND LOCAL GOV'T REVENUE	STATE AND LOCAL GOV'T EXPENDITURES
1976	0.5	0.5	0	0	0	0	0	1.2	0.5
77	1.6	1.6	0	0	0	0	0.1	3.8	1.7
78	5.4	4.9	0.1	0	0.1	0.2	0.4	9.6	4.6
79	10.5	8.8	0.6	0.1	0.3	0.6	1.6	9.6	9.8
80	78.0	72.0	2.2	0.3	1.3	2.2	6.2	132.4	66.0
81	88.5	72.0	5.8	1.5	3.7	5.6	16.5	161.7	86.8
82	94.2	79.6	4.5	2.7	3.0	4.5	13.2	198.1	134.0
83	104.0	79.6	7.1	5.3	4.9	7.1	21.9	159.4	105.4
84	102.2	79.6	6.1	6.7	4.2	5.8	18.6	143.6	100.5
85	103.7	79.6	6.1	8.0	4.3	5.8	19.3	136.3	102.3
86	106.4	79.6	6.6	9.4	4.9	6.1	21.4	132.8	106.9
87	109.7	79.6	7.2	10.8	5.4	6.6	24.2	131.7	112.7
88	113.3	79.6	7.9	12.2	6.2	7.1	27.7	132.3	119.7
89	117.5	79.6	9.0	13.6	7.3	8.0	32.1	134.0	127.8
90	122.2	79.6	10.2	15.0	8.5	8.9	37.2	137.4	137.4

[1] Impacts are measured as deviations from the situation in which no gas pipeline is built.

increases achieved during construction and early production (Table 38). The population of the state shows an uneven increase throughout the period, with almost 63 percent of the longer term impact centered in Anchorage, secondary growth booms occurring in the Southcentral and Southeast regions, which are expected to be centers of government spending. Interior has a short term population boom during construction. Turning back to Table it becomes evident that while per capita personal incomes grow slightly in the state as a whole, immigration quickly erases these gains. Regionally, the isolated Interior, Northwest, and Southwest areas gain from construction and the influx of higher income state workers. Southeast and Fairbanks change very little, while the influx of support sector workers and additional population into the Anchorage and Southcentral Regions is large enough to slightly reduce per capita incomes.

Overall, this route does not differ significantly in economic impact from the previous two.

Interior Route

The Interior Route passes to the south of the previous three routes but since it is also a Trans-Canadian option, it contributes neither large employment nor a large amount of property taxes to the State of Alaska. Consequently, although its impact on the Alaskan economy is greater than the Prime Route, the important impacts arise not out of construction, but out of state expenditures of petroleum production related revenues for general purposes.

The impact on real gross product follows the familiar construction boom, post-construction bust, state spending induced growth cycle. Again, as in the case of the Prime Route, production of goods, services, and business activity is confined to the construction area and its main support bases during the pipeline construction period. Following this, the main centers of economic growth in Alaska will be the existing centers of government and commerce. To see all this, consider Table 40. The large number of construction workers employed during 1979-80 in the Interior Region generate much economic activity, as can be seen by the $47 million and $70 million of value added attributable to the Interior Region in those years. Interior has 74 percent and 61 percent of the impact on real gross product during these peak years, compared with Anchorage's 21 and 23 percent. Taken together, these two regions account for most of the impact in the short term. By 1990, however, Anchorage accounts for 56 percent of the pipeline impact, whereas Interior accounts for only 16.5 percent. In total, the dimensions of the boom, bust, and growth periods are larger for the Interior Route than any of the previous cases. The peak of the boom, $115.5 million of value added in 1980 is 2.8 times, and $74.8 million larger than, the Prime Route boom. Ultimately, the gross product impact is some eight million dollars larger, as well. More miles of pipe, located in the same geographical vicinity, yield larger economic activity.

Another dimension of the impact is that of employment. The regional pattern of employment impacts is similar to that for real gross product,

Table 40

INTERIOR ROUTE
IMPACT ON REAL GROSS PRODUCT BY REGION AND YEAR[1]
Millions of 1958 Dollars

YEAR	NORTHWEST	SOUTHWEST	SOUTHEAST	SOUTHCENTRAL	ANCHORAGE	INTERIOR	FAIRBANKS	TOTAL
1976	*[2]	*	*	*	0.2	*	*	0.3
77	*	*	0.1	0.1	1.1	2.5	0.1	4.0
78	0.1	0.1	0.4	0.3	3.7	9.8	0.4	14.8
79	0.3	0.2	1.0	0.7	13.5	46,9	0.9	63.4
80	1.3	0.9	4.2	2.9	32.0	70.3	3.9	115.5
81	1.8	1.2	5.3	3.8	26.9	8,0	5.2	52.0
82	1.4	0.8	3.7	2.6	18.5	7.7	3.7	38.4
83	1.3	0.8	3.3	2.4	18.2	7.4	3.4	36.9
84	1.2	0.8	3.3	2.4	18,7	7.3	3.5	37.1
85	1.3	0.8	3.2	2.4	19.4	7.5	3.5	38.1
86	1.3	0.8	3.2	2.4	20.4	7.5	3.6	39.2
87	1.4	0.8	3.2	2.4	21.6	7.6	3.7	40.8
88	1.5	0.9	3.3	2.4	23,0	7.8	3.9	42.7
89	1.6	0.9	3.3	2.5	24.6	7.8	4.0	44.8
90	1.7	1.0	3.4	2.6	26.6	7.8	4.2	47.3

[1] Impacts are measured as deviations from the situation in which no gas pipeline is built.

[2] * = less than 50 thousand dollars.

with the weight of the construction period transient impacts being in the Interior Region, and longer term increases occurring in Anchorage, the commercial center of the state. Seventy-two percent of additional employment of 6,100 in the state in 1979 is shown by Table 41 to be in the Interior Region, while Anchorage has 18 percent. Interior still has 51 percent, or 5,800, in 1980; but Anchorage has increased to 28 percent and by 1990, when Interior has but two percent of employment impacts induced by the pipeline, the development of the support sectors gives Anchorage 58 percent of the total of five thousand.

The industry distribution of employment increases is shown in Table 42. Even during the peak construction year of 1980, 5,400 wage earners, or 48 percent, are in the support sectors. This contrast with 21 percent government and 27 percent construction workers. By 1990, the support sector registers a slight relative gain to 52 percent of the impact, although this represents an absolute impact of only 2,600 workers. Construction has an impact in 1990 of only 300 workers, six percent of the total employment impact. The absolute employment impact of 5,000 workers in 1990 is quite small, being only 700 more than the Prime Route.

Increased employment yields increases both in population which is induced to migrate into Alaska and in wages and salaries paid in the state. The population impacts are shown in Table 43 . In spite of the fact that most of the construction jobs are located in the Interior, almost 50 percent of the population increase is projected to take place in

Table 41

INTERIOR ROUTE
IMPACT ON EMPLOYMENT BY REGION AND YEAR[1]
Thousands of Persons

YEAR	NORTHWEST	SOUTHWEST	SOUTHEAST	SOUTHCENTRAL	ANCHORAGE	INTERIOR	FAIRBANKS	TOTAL
1976	*[2]	*	*	*	*	*	*	0.1
77	*	*	*	*	0.1	0.3	*	0.4
78	*	*	0.1	0.1	0.3	1.0	0.1	1.6
79	*	*	0.2	0.1	1.1	4.4	0.1	6.1
80	0.2	0.2	0.9	0.5	3.2	5.8	0.6	11.3
81	0.2	0.2	1.2	0.7	3.3	0.2	0.7	6.5
82	0.1	0.2	0.8	0.5	2.2	0.1	0.5	4.5
83	0.1	0.1	0.7	0.4	2.1	0.1	0.5	4.2
84	0.1	0.1	0.7	0.4	2.2	0.1	0.5	4.2
85	0.1	0.1	0.7	0.4	2.2	0.1	0.5	4.2
86	0.1	0.1	0.7	0.4	2.3	0.1	0.5	4.3
87	0.1	0.1	0.7	0.4	2.4	0.1	0.5	4.4
88	0.1	0.1	0.7	0.4	2.5	0.1	0.5	4.6
89	0.1	0.1	0.7	0.5	2.7	0.1	0.5	4.8
90	0.1	0.2	0.7	0.5	2.9	0.1	0.5	5.0

[1] Impacts are measured as deviations from the situation in which no gas pipeline is built.

[2] * = less than 50 persons.

Table 42

INTERIOR ROUTE
IMPACT ON EMPLOYMENT BY INDUSTRY AND YEAR[1]
Thousands of Persons

YEAR	AGRICULTURE, FORESTRY, & FISHERIES	MINING	CONSTRUCTION	MANUFACTURING	TRANSPORTATION, COMMUNICATION, AND UTILITIES	TRADE	FINANCE, INSURANCE, REAL ESTATE	SERVICE	GOVERNMENT	OTHER	TOTAL
1976	0	0	*[2]	0	*	*	*	*	*	*	0.1
77	0	0	0.2	0	*	0.1	*	0.1	0.1	*	0.4
78	0	0	0.6	0	0.1	0.3	*	0.3	0.2	*	1.6
79	0	0	2.3	0	0.2	1.3	0.1	1.5	0.5	0.1	6.1
80	0	0.1	3.0	0	0.5	2.2	0.2	2.5	2.4	0.4	11.3
81	0	0.1	0.3	0	0.3	0.9	0.3	1.1	3.1	0.5	6.5
82	0	0.1	0.2	0	0.2	0.6	0.2	0.7	2.1	0.3	4.5
83	0	0.1	0.2	0	0.2	0.6	0.2	0.7	1.9	0.3	4.2
84	0	0.1	0.2	0	0.2	0.6	0.2	0.7	1.9	0.3	4.2
85	0	0.1	0.2	0	0.2	0.6	0.2	0.8	1.8	0.3	4.2
86	0	0.1	0.2	0	0.2	0.7	0.2	0.8	1.8	0.3	4.3
87	0	0.1	0.2	0	0.2	0.7	0.2	0.9	1.8	0.3	4.4
88	0	0.1	0.2	0	0.2	0.7	0.2	1.0	1.8	0.3	4.6
89	0	0.1	0.3	0	0.3	0.8	0.2	1.1	1.8	0.3	4.8
90	0	0.1	0.3	0	0.3	0.8	0.3	1.2	1.8	0.3	5.0

[1] Impacts are measured as deviations from the situation in which no gas pipeline is built.

[2] * = less than 50 persons.

Table 43

INTERIOR ROUTE
IMPACT ON POPULATION BY REGION AND YEAR[1]
Thousands of Persons

YEAR	NORTHWEST	SOUTHWEST	SOUTHEAST	SOUTHCENTRAL	ANCHORAGE	INTERIOR	FAIRBANKS	TOTAL
1976	0	0	*[2]	*	*	0	*	0.1
77	*	*	0.1	0.1	0.2	0.1	*	0.6
78	*	0.1	0.2	0.2	0.9	0.5	0.2	2.1
79	0.1	0.2	0.7	0.7	3.6	1.9	0.6	8.0
80	0.2	0.4	1.8	1.8	7.8	2.3	1.4	15.7
81	0.2	0.2	1.7	1.8	6.4	0.1	1.2	11.5
82	0.2	0.2	1.4	1.5	5.2	0.1	1.1	9.7
83	0.2	0.2	1.3	1.4	5.2	0.1	1.1	9.5
84	0.2	0.2	1.3	1.4	5.3	0.1	1.1	9.6
85	0.2	0.2	1.3	1.4	5.5	0.1	1.1	9.8
86	0.2	0.2	1.3	1.4	5.7	0.1	1.1	10.0
87	0.2	0.2	1.3	1.4	5.9	0.1	1.1	10.2
88	0.2	0.2	1.3	1.5	6.2	0.1	1.1	10.5
89	0.2	0.2	1.3	1.5	6.5	0.1	1.1	10.8
90	0.2	0.2	1.3	1.5	6.9	0.1	1.1	11.1

[1] Impacts are measured as deviations from the situation in which no gas pipeline is built.

[2] * = less than 50 persons.

Anchorage. This is mainly because of the nature of construction employment on the pipeline. Most workers living in the camps will tend not to relocate their families from the Lower 48, or will locate them in existing urban centers of the state where utility services and housing, and stores and schools are more readily available. Also, much of the employment growth is centered in the support sector and government services, and these are centered in existing urban areas. This latter tendency becomes more pronounced following construction, when out of a total population impact of 11,100 people, 62 percent are projected to locate in Anchorage. Wages and salaries follow a pattern similar to employment, as can be seen in Table 44.

The fact that there is population inmigration causes the increases achieved in personal income brought by pipeline development to be dissipated. The geographical distribution of impact is similar to the Prime Route, showing gains only in the areas where there is little population increase, and substantial gains only where the inmigrants tended to be very high salaried relative to the historical period. This case is, of course, the Interior, where annual average wages are projected to top $50,000 per construction and oil and gas worker in 1990, and $35,000 per construction worker in 1980. By 1990, government workers in this area show a $1,000 salary premium over Anchorage; and in mining, the premium is $19,000 over Anchorage wages by 1990. However, even in Interior the inmigration stimulated by state spending and pipeline construction cuts heavily into the enormous per capita income increases noted during the

Table 44

INTERIOR ROUTE
IMPACT ON REAL WAGES AND SALARIES PAID BY REGION AND YEAR[1]
Millions of 1967 Dollars

YEAR	NORTHWEST	SOUTHWEST	SOUTHEAST	SOUTHCENTRAL	ANCHORAGE	INTERIOR	FAIRBANKS	TOTAL
1976	0	0	0.1	0.1	0.1	0	0	0.3
77	0.1	0	0.2	0.1	0.7	2.8	0.1	4.1
78	0.1	0.1	0.6	0.3	2.3	10.6	0.4	14.5
79	0.2	0.2	1.4	0.8	7.7	45.4	0.9	56.8
80	1.0	1.2	6.3	3.6	22.1	57.3	4.4	95.6
81	1.3	1.6	8.4	4.8	22.8	1.3	5.8	45.8
82	1.0	1.1	5.9	3.4	15.8	1.1	4.1	32.5
83	0.9	1.0	5.6	3.1	15.4	1.0	3.8	30.9
84	0.9	1.0	5.4	3.1	15.8	1.1	3.8	31.3
85	0.9	1.0	5.6	3.2	16.4	1.1	3.9	32.1
86	0.9	1.1	5.6	3.3	17.3	1.2	4.0	33.3
87	0.9	1.1	5.8	3.3	18.3	1.2	4.1	34.7
88	1.0	1.2	5.9	3.4	19.6	1.2	4.3	36.5
89	1.1	1.3	6.2	3.5	21.0	1.2	4.5	38.6
90	1.1	1.2	6.4	3.7	22.8	1.3	4.6	41.1

[1] Impacts are measured as deviations from the situation in which no gas pipeline is built.

Table 45

INTERIOR ROUTE
IMPACT ON STATE AND LOCAL REVENUES AND EXPENDITURES[1]
Millions of Dollars

YEAR	STATE TOTAL	PETROLEUM REVENUES	PERSONAL AND CORPORATE INCOME TAX	INTEREST INCOME	SPECIAL FUND REVENUE	OTHER GENERAL FUND REVENUE	LOCAL GOV'T REVENUE FROM OWN SOURCES	STATE AND LOCAL GOV'T REVENUE	STATE AND LOCAL GOV'T EXPENDITURES
1976	1.0	1.0	0	0	0	0	0	1.2	1.0
77	3.1	3.0	0.1	0	0	0	0.2	3.8	3.2
78	10.5	9.1	0.5	0	0.3	0.6	1.3	13.4	9.6
79	21.8	16.4	2.0	0.2	1.2	2.0	5.4	30.2	23.0
80	105.1	82.2	8.5	0.5	5.2	8.6	23.9	142.7	108.1
81	125.0	82.2	15.5	1.9	10.1	15.4	45.3	187.0	149.1
82	107.7	83.4	8.0	3.3	5.2	7.9	23.4	144.4	109.6
83	110.1	89.8	5.8	4.8	4.0	5.8	17.7	140.9	104.8
84	112.1	89.8	6.1	6.6	4.2	5.8	18.6	144.1	107.8
85	115.1	89.8	6.5	7.9	4.7	6.2	20.8	149.3	112.6
86	118.5	89.8	7.2	9.5	5.4	6.8	23.7	155.7	118.6
87	122.3	89.8	8.0	11.1	6.1	7.4	27.0	163.1	125.5
88	126.5	89.8	8.9	12.6	7.0	8.0	31.0	171.7	133.4
89	131.2	89.8	10.0	14.2	8.2	8.9	36.0	181.7	142.6
90	136.5	89.8	11.5	15.8	9.5	9.9	41.8	193.4	153.4

[1] Impacts are measured as deviations from the situation in which no gas pipeline is built.

construction period. (See Table 46.) The skills mix in other regions tends to become more support industry-oriented during the construction period, the population increase cuts even more heavily into what personal income increases there are, and per capita income declines. The declines in personal income occur in the regions with the largest inmigration -- Southeast, Southcentral, and Anchorage.

Fort Yukon Route

The Fort Yukon Route shows larger impacts on the Alaskan economy than the Interior Route. As shown in Table 47 , the statewide impact on real gross product is about four million dollars larger by 1990. The short term construction period impact is also $64 million larger in the peak construction year, 1980. In comparison with the Prime Route, the 1990 Fort Yukon Route impact is $11 million worth of value added larger, while the short term additional impact is $139 million. The greater difference comes about because of the greater distance which the pipeline must traverse in Alaska and accompanying greater construction activity and value of capital put in place. Regionally, the distribution of output is much the same as the previous cases, showing a large construction boom in Anchorage and in the Interior. The major difference is that the boom in Interior is much larger than in any of the previous cases. In 1979, for example, Interior accounts for 77 percent of the impact on state real gross product, and in 1980, 66 percent. The corresponding numbers for the Prime Route are much smaller - 68 and 45 percent, respectively -

Table 46

INTERIOR ROUTE
IMPACT ON PERSONAL INCOME AND PER CAPITA INCOME BY REGION AND YEAR[1]
Personal Income in Millions of Dollars, Per Capita Income in Dollars

	NORTHWEST		SOUTHWEST		SOUTHEAST		SOUTHCENTRAL		ANCHORAGE		INTERIOR		FAIRBANKS		TOTAL	
YEAR	PERSONAL INCOME	PER CAPITA INCOME	PERSONAL INCOME	PER CAPITA INCOME	PERSONAL INCOME	PER CAPITA INCOME	PERSONAL INCOME	PER CAPITA INCOME	PERSONAL INCOME	PER CAPITA INCOME	PERSONAL INCOME	PER CAPITA INCOME	PERSONAL INCOME	PER CAPITA INCOME	PERSONAL INCOME	PER CAP INCOM
1976	0	0	0	0	0.2	2	0.1	0	0.4	1	0	0	0.1	1	0.9	1
77	0	- 3	- 0.1	- 6	0.2	- 6	0.1	- 7	0.9	- 6	9.3	736	0.1	- 4	10.6	16
78	0	- 12	- 0.2	- 19	0.4	- 30	0.2	- 28	2.8	- 27	35.3	2,643	0	- 25	38.6	50
79	- 0.3	- 72	- 1.1	- 100	- 1.4	- 156	- 1.1	- 134	6.8	- 134	156.3	10,701	1.9	- 134	157.5	184
80	0.5	- 68	0.7	- 77	11.4	- 148	7.7	- 157	42.5	- 155	205.1	13,366	6.6	- 127	274.6	238
81	2.6	71	4.4	91	25.6	71	17.3	4	66.0	11	4.9	302	17.7	67	138.4	37
82	1.9	16	3.2	35	18.4	2	12.4	- 31	46.1	- 30	4.4	191	12.8	7	99.2	- 12
83	1.8	4	3.2	26	17.9	- 12	12.1	- 35	47.1	- 38	4.4	183	12.5	- 3	98.9	- 22
84	1.9	11	3.3	22	18.4	- 19	12.5	- 37	50.1	- 41	4.6	211	13.0	- 7	103.9	- 26
85	2.0	15	3.5	21	19.3	- 22	13.1	- 38	54.3	- 43	4.9	224	13.7	- 9	110.8	- 28
86	2.2	25	3.8	24	20.4	- 23	13.9	- 38	59.2	- 45	5.2	239	14.6	- 9	119.1	- 29
87	2.3	26	4.0	23	21.6	- 23	14.8	- 37	65.1	- 45	5.5	248	15.6	- 8	129.0	- 29
88	2.5	30	4.3	26	23.1	- 20	15.9	- 36	72.2	- 45	5.8	253	16.8	- 5	140.6	- 30
89	2.7	36	4.7	33	24.8	- 17	17.1	- 34	80.5	- 45	6.3	287	18.1	- 2	154.2	- 29
90	3.0	47	5.1	41	26.8	- 12	18.6	- 32	90.7	- 43	6.7	313	19.6	1	170.5	- 26

[1] Impacts are measured as deviations from the situation in which no gas pipeline is built.

Table 47

FORT YUKON ROUTE
IMPACT ON REAL GROSS PRODUCT BY REGION AND YEAR[1]
Millions of 1958 Dollars

YEAR	NORTHWEST	SOUTHWEST	SOUTHEAST	SOUTHCENTRAL	ANCHORAGE	INTERIOR	FAIRBANKS	TOTAL
1976	*[2]	*	0.1	*	0.2	*	0.1	0.4
77	0.1	*	0.2	0.1	1.5	3.8	0.2	5.8
78	0.2	0.1	0.6	0.4	5.3	15.1	0.5	22.1
79	0.4	0.3	1.4	1.0	19.9	79.8	1.2	104.0
80	1.7	1.2	5.3	3.7	44.0	118.6	5.0	179.4
81	2.3	1.5	6.9	4.9	34.8	9.2	6.7	66.2
82	1.6	1.0	4.3	3.1	21.5	8.7	4.3	44.5
83	1.4	0.8	3.7	2.6	20.0	8.5	3.8	40.8
84	1.3	0.8	3.5	2.5	20.1	8.4	3.7	40.4
85	1.4	0.8	3.5	2.5	20.8	8.5	3.8	41.3
86	1.4	0.9	3.5	2.5	21.8	8.5	3.9	42.4
87	1.5	0.9	3.5	2.5	23.0	8.7	4.0	44.1
88	1.6	0.9	3.5	2.6	24.6	8.8	4.1	46.2
89	1.7	1.0	3.6	2.7	26.3	8.8	4.3	48.4
90	1.8	1.0	3.6	2.8	28.5	8.8	4.5	51.1

[1] Impacts are measured as deviations from the situation in which no gas pipeline is built.

[2] * = less than 50 thousand dollars.

and the absolute size difference of the impact is even more striking. In this case as with the other routes, however, by 1990 Anchorage feels the major stimulus of development. In that year, 56 percent of the impact on gross product is centered in Anchorage.

The story is similar for employment. At the peak of the construction boom, the state shows 16,500 additional wage earners employed (see Table 48) of which 56.3 percent, or 9,300, are employed in Interior and 26 percent, or 4,300, are employed in Anchorage. By 1990, the percentages for Anchorage and Interior are 57.4 percent and 3.7 percent, respectively, showing the boom-bust cycle Interior feels as a result of construction and the steadier growth induced in Anchorage.

By industry, much of the increased employment shows up in the support sectors and government. In Table 49's peak construction year of 1980, construction and mining together account for 4,600 persons, or 28 percent of the employment impact. By contrast, 8,600, or 52 percent of the increase is in the supporting sectors and 18 percent, or 3,000, in the service sector. By the year 1990, the bias of the increase becomes even more pronounced, with exactly 50 percent of the increase occurring in the support sector, 37 percent in government, and only 7.4 percent in mining and construction.

As a direct result of the increase in employment, there is an increase in real wages and salaries paid which follows the construction boom and bust and, subsequently, grows more steadily as the Alaskan economy expands. Table [illegible] shows this, as well as that regionally, Interior shows a higher

Table 48

FORT YUKON ROUTE
IMPACT ON EMPLOYMENT BY REGION AND YEAR[1]
Thousands of Persons

YEAR	NORTHWEST	SOUTHWEST	SOUTHEAST	SOUTHCENTRAL	ANCHORAGE	INTERIOR	FAIRBANKS	TOTAL
1976	*[2]	*	*	*	*	*	*	0.1
77	*	*	*	*	0.1	0.4	*	0.6
78	*	*	0.1	0.1	0.5	1.5	0.1	2.3
79	*	0.1	0.3	0.2	1.6	7.1	0.2	9.4
80	0.2	0.2	1.1	0.7	4.3	9.3	0.7	16.5
81	0.3	0.3	1.5	0.9	4.2	0.2	1.0	8.4
82	0.2	0.2	0.9	0.6	2.6	0.2	0.6	5.2
83	0.1	0.2	0.8	0.5	2.3	0.2	0.5	4.6
84	0.1	0.2	0.8	0.5	2.3	0.1	0.5	4.5
85	0.1	0.2	0.8	0.5	2.4	0.1	0.5	4.5
86	0.1	0.2	0.7	0.5	2.5	0.1	0.5	4.6
87	0.1	0.2	0.7	0.5	2.6	0.2	0.5	4.7
88	0.1	0.2	0.8	0.5	2.7	0.2	0.5	4.9
89	0.1	0.2	0.8	0.5	2.9	0.2	0.5	5.1
90	0.1	0.2	0.8	0.5	3.1	0.2	0.5	5.4

[1] Impacts are measured as deviations from the situation in which no gas pipeline is built.

[2] * = less than 50 persons.

Table 49

FORT YUKON ROUTE
IMPACT ON EMPLOYMENT BY INDUSTRY AND YEAR[1]
Thousands of Persons

YEAR	AGRICULTURE, FORESTRY, & FISHERIES	MINING	CONSTRUCTION	MANUFACTURING	TRANSPORTATION, COMMUNICATION, AND UTILITIES	TRADE	FINANCE, INSURANCE, REAL ESTATE	SERVICE	GOVERNMENT	OTHER	TOTAL
1976	0	0	*[2]	0	*	*	*	*	*	*	0.1
77	0	0	0.2	0	*	0.1	*	0.1	0.1	*	0.6
78	0	0	0.9	0	0.1	0.4	*	0.5	0.3	0.1	2.3
79	0	0	3.5	0	0.4	2.2	0.1	2.4	0.7	0.2	9.4
80	0	0.1	4.5	0	0.7	3.6	0.3	4.0	3.0	0.6	16.5
81	0	0.1	0.4	0	0.4	1.2	0.3	1.4	4.0	0.6	8.4
82	0	0.1	0.3	0	0.2	0.7	0.2	0.9	2.5	0.4	5.2
83	0	0.1	0.2	0	0.2	0.7	0.2	0.8	2.1	0.3	4.6
84	0	0.1	0.2	0	0.2	0.7	0.2	0.8	2.0	0.3	4.5
85	0	0.1	0.2	0	0.2	0.7	0.2	0.8	2.0	0.3	4.5
86	0	0.1	0.2	0	0.2	0.7	0.2	0.9	1.9	0.3	4.6
87	0	0.1	0.3	0	0.2	0.7	0.2	1.0	1.9	0.3	4.7
88	0	0.1	0.3	0	0.3	0.8	0.2	1.0	1.9	0.3	4.9
89	0	0.1	0.3	0	0.3	0.8	0.3	1.1	1.9	0.3	5.1
90	0	0.1	0.3	0	0.3	0.9	0.3	1.2	2.0	0.4	5.4

[1] Impacts are measured as deviations from the situation in which no gas pipeline is built.

[2] * = less than 50 persons.

Table 50

FORT YUKON ROUTE
IMPACT ON REAL WAGES AND SALARIES PAID BY REGION AND YEAR[1]
Millions of 1967 Dollars

YEAR	NORTHWEST	SOUTHWEST	SOUTHEAST	SOUTHCENTRAL	ANCHORAGE	INTERIOR	FAIRBANKS	TOTAL
1976	0	0	0.1	0.1	0.2	0	0	0.4
77	0.1	0	0.3	0.2	1.0	4.3	0.2	5.9
78	0.1	0.2	0.8	0.4	3.3	16.0	0.5	21.3
79	0.3	0.3	2.0	1.1	11.2	70.1	1.3	86.4
80	1.3	1.5	8.0	4.5	29.6	88.9	5.5	139.1
81	1.7	2.0	10.9	6.2	29.6	1.5	7.5	59.3
82	1.1	1.3	6.9	3.9	18.5	1.3	4.8	37.9
83	0.9	1.1	6.1	3.4	17.0	1.2	4.2	34.0
84	0.9	1.1	5.9	3.3	17.1	1.2	4.1	33.8
85	0.9	1.1	6.0	3.4	17.6	1.2	4.2	34.5
86	0.9	1.2	6.0	3.5	18.5	1.3	4.3	35.7
87	1.0	1.2	6.2	3.5	19.6	1.3	4.4	37.2
88	1.1	1.2	6.3	3.6	21.0	1.4	4.6	39.1
89	1.1	1.3	6.6	3.7	22.5	1.4	4.8	41.3
90	1.1	1.3	6.9	3.9	24.4	1.4	4.9	44.0

[1] Impacts are measured as deviations from the situation in which no gas pipeline is built.

percentage of wages and salaries paid during the boom period than it does of employment, reflecting the fact that during the construction boom, Interior has a large influx of highly paid pipeline construction workers.

Population increases are induced by the increased employment opportunities. However, these increases are mostly in the major urban centers of the state, rather than along the pipeline route itself. Even in the peak construction year of 1980, Anchorage shows just over 49 percent of the total population increase (see Table 51), while Interior shows 15 percent. By 1990, the numbers are 61 percent and one percent, respectively. The total population increase is somewhat larger in this case than the Interior Route, showing 7,400 additional persons in 1980 and 1,500 additional in 1990. In comparison with the Prime Route, the additional impact is 17,300 in 1980 and 4,000 in 1990.

The increase in population will require additional spending for public services. As can be seen in Table 52 , the impact on state and local government spending is $193.4 million in 1980 and a little over $164 million in 1990. In comparison with the Interior Route, spending is larger by $44.3 million and $10.7 million in 1980 and 1990, while in comparison with the Prime Route, Fort Yukon shows impacts which are $108.6 million and $32.1 million larger in the two years. In spite of this fact, however, per capita income declines in Alaska over the period out to 1990.

Table 53 shows the impact of the Fort Yukon Route on personal income and per capita income. Although personal income increases substantially over the period, once again immigration dissipates the potential gains.

Table 51

FORT YUKON ROUTE
IMPACT ON POPULATION BY REGION AND YEAR[1]
Thousands of Persons

YEAR	NORTHWEST	SOUTHWEST	SOUTHEAST	SOUTHCENTRAL	ANCHORAGE	INTERIOR	FAIRBANKS	TOTAL
1976	*[2]	0	*	*	*	0	*	0.1
77	*	*	0.1	0.1	0.3	0.2	0.1	0.8
78	0.1	0.1	0.3	0.3	1.3	0.7	0.2	3.0
79	0.2	0.4	1.1	1.1	5.6	2.9	1.0	12.4
80	0.4	0.6	2.5	2.6	11.4	3.5	2.1	23.1
81	0.2	0.3	2.2	2.5	8.5	0.1	1.7	15.5
82	0.2	0.3	1.8	1.9	6.5	0.1	1.4	12.3
83	0.2	0.3	1.6	1.7	6.3	0.1	1.3	11.7
84	0.2	0.3	1.6	1.7	6.4	0.1	1.3	11.6
85	0.2	0.3	1.6	1.7	6.5	0.1	1.3	11.7
86	0.2	0.3	1.5	1.7	6.6	0.1	1.3	11.7
87	0.2	0.3	1.5	1.7	6.8	0.1	1.2	11.9
88	0.2	0.3	1.5	1.7	7.1	0.1	1.2	12.0
89	0.2	0.3	1.5	1.7	7.3	0.1	1.2	12.3
90	0.2	0.3	1.5	1.7	7.7	0.1	1.2	12.6

[1] Impacts are measured as deviations from the situation in which no gas pipeline is built.

[2] * = less than 50 persons.

Table 52

FORT YUKON ROUTE
IMPACT ON STATE AND LOCAL REVENUES AND EXPENDITURES[1]
Millions of Dollars

YEAR	STATE TOTAL	PETROLEUM REVENUES	PERSONAL AND CORPORATE INCOME TAX	INTEREST INCOME	SPECIAL FUND REVENUE	OTHER GENERAL FUND REVENUE	LOCAL GOV'T REVENUE FROM OWN SOURCES	STATE AND LOCAL GOV'T REVENUE	STATE AND LOCAL GOV'T EXPENDITURES
1976	1.3	1.3	0	0	0	0	0	1.6	1.3
77	3.9	3.8	0.1	0	0	0	0.2	4.8	4.1
78	13.6	11.6	0.7	0	0.5	0.9	1.9	17.5	12.7
79	28.7	20.8	2.9	0.2	1.7	3.0	7.9	40.6	31.4
80	122.9	88.2	12.9	0.6	8.0	13.1	36.5	175.7	136.9
81	150.1	88.2	22.6	2.1	14.7	22.5	66.4	236.8	193.4
82	120.3	89.4	10.3	3.6	6.8	10.1	30.4	165.7	127.5
83	119.1	95.8	6.8	5.3	4.6	6.7	20.7	154.0	115.2
84	120.3	95.8	6.7	6.9	4.6	6.4	20.5	155.1	116.3
85	123.1	95.8	7.1	8.5	5.1	6.7	22.4	159.9	120.8
86	126.7	95.8	7.7	10.2	5.8	7.3	25.4	166.6	127.0
87	130.7	95.8	8.6	11.9	6.5	7.9	29.0	174.4	134.3
88	135.2	95.8	9.6	13.6	7.5	8.6	33.2	183.6	142.7
89	140.2	95.8	10.7	15.3	8.7	9.6	38.5	194.3	152.6
90	145.9	95.8	12.2	16.9	10.2	10.7	44.8	206.9	164.1

[1] Impacts are measured as deviations from the situation in which no gas pipeline is built.

Table 53

FT. YUKON ROUTE
IMPACT ON PERSONAL INCOME AND PER CAPITA INCOME BY REGION AND YEAR[1]
Personal Income in Millions of Dollars, Per Capita Income in Dollars

	NORTHWEST		SOUTHWEST		SOUTHEAST		SOUTHCENTRAL		ANCHORAGE		INTERIOR		FAIRBANKS		TOTAL	
YEAR	PERSONAL INCOME	PER CAPITA INCOME	PERSONAL INCOME	PER CAPITA INCOME	PERSONAL INCOME	PER CAPITA INCOME	PERSONAL INCOME	PER CAPITA INCOME	PERSONAL INCOME	PER CAPITA INCOME	PERSONAL INCOME	PER CAPITA INCOME	PERSONAL INCOME	PER CAPITA INCOME	PERSONAL INCOME	PER CAP INCOM
1976	0.1	6	0	0	0.2	1	0.2	2	0.5	1	0	0	0.2	2	1.1	1
77	0	- 4	0.1	- 7	0.2	- 8	0.1	- 56	1.1	- 9	13.9	1,093	0	- 9	15.3	23
78	0	- 17	- 0.3	- 29	0.3	- 47	0.1	- 44	3.6	- 42	53.1	3,890	- 0.1	- 39	56.8	74
79	- 0.5	- 118	- 1.8	- 164	- 2.6	- 250	- 2.0	- 212	8.9	- 215	240.0	15,296	- 3.3	- 218	238.9	271
80	0.4	- 163	0.4	- 152	12.8	- 267	8.6	- 260	54.0	- 260	316.2	18,957	6.9	- 232	399.2	335
81	3.3	78	5.7	107	33.3	79	22.5	- 5	85.7	2	5.9	331	22.9	74	179.4	35
82	2.2	- 2	3.7	21	21.5	- 24	14.5	- 54	54.0	- 55	5.0	162	5.0	- 14	115.8	- 36
83	2.0	- 19	3.5	6	19.6	- 47	13.3	- 61	51.8	- 67	4.9	145	13.7	- 32	108.9	- 51
84	2.1	- 8	3.6	2	19.8	- 54	13.4	- 64	54.1	- 69	5.2	193	14.0	- 36	112.3	- 54
85	2.2	- 2	3.7	- 2	20.7	- 55	14.1	- 61	58.2	- 70	5.4	196	14.7	- 36	119.0	- 55
86	2.4	11	4.0	2	21.8	- 55	14.9	- 60	63.3	- 69	5.8	226	15.7	- 33	127.7	- 54
87	2.5	13	4.3	5	23.1	- 51	15.8	- 58	69.7	- 67	6.1	235	16.7	- 30	138.2	- 52
88	2.7	18	4.6	9	24.7	- 46	17.0	- 54	77.2	- 66	6.5	251	17.9	- 26	150.6	- 50
89	2.9	25	5.0	18	26.5	- 41	18.3	- 51	86.1	- 64	7.0	289	19.4	- 21	165.2	- 47
90	3.2	37	5.4	26	28.7	- 33	19.9	- 48	97.0	- 60	7.5	325	21.0	- 16	182.6	- 43

[1] Impacts are measured as deviations from the situation in which no gas pipeline is built.

Also, as in previous cases, the distribution of gains is very uneven across regions. For example, because of the very low per capita income of current Interior residents and the very high salaries earned by oil and gas construction workers, who constitute almost all the short term inmigrants, there is an enormous transient increase in per capita income of Interior residents. A small part of this gain persists even after the majority of these workers leave after construction. By contrast, the support bases of Anchorage and Fairbanks show per capita income decreases, as do the other areas showing noticeable population increases -- Southeast and Southcentral. Except for the peak of the construction period, when skilled workers may tend to gravitate toward the pipeline construction areas, the Northwest and Southwest show very little impact on per capita income. Overall, the greater inmigration associated with the Fort Yukon Route shows a small long term decrease in per capita income, even though there is a short term transient increase.

Fairbanks - Alaska Highway Route

The Fairbanks-Alaska Highway Route shows (Table 54) a larger impact on Alaska's economy than any of the other Trans-Canada pipeline routes. At the peak of the construction boom, the total impact on value added is $249.7 million, which is 70 million more than the Fort Yukon case and 209 million more than the Prime Route. By 1990 the impact is much smaller, both absolutely and relative to the other Trans-Canada routes. However, there is still an impact of $56.5 million, which is 5.4 million more than

Table 54

FAIRBANKS - ALASKA HIGHWAY ROUTE
IMPACT ON REAL GROSS PRODUCT BY REGION AND YEAR[1]
Millions of 1958 Dollars

YEAR	NORTHWEST	SOUTHWEST	SOUTHEAST	SOUTHCENTRAL	ANCHORAGE	INTERIOR	FAIRBANKS	TOTAL
1976	*[2]	*	0.1	0.1	0.3	*	0.1	0.6
77	0.1	0.1	0.3	0.2	2.2	3.4	3.2	9.4
78	0.3	0.2	0.9	0.6	8.1	13.5	11.6	35.2
79	0.7	0.5	2.1	1.5	30.4	69.4	47.6	152.2
80	2.3	1.6	7.2	5.0	61.8	107.1	64.8	249.7
81	3.1	2.0	9.3	6.6	46.4	12.6	10.9	91.0
82	2.0	1.2	5.4	3.9	27.2	11.9	7.3	58.9
83	1.7	1.0	4.4	3.2	24.2	11.5	6.5	52.5
84	1.6	1.0	4.2	3.0	23.9	11.4	6.3	51.4
85	1.6	1.0	4.1	3.0	24.7	11.5	6.4	52.3
86	1.7	1.0	4.1	3.0	25.4	7.4	4.5	47.2
87	1.8	1.0	4.1	3.0	26.7	7.6	4.6	48.7
88	1.9	1.1	4.1	3.1	28.3	7.7	4.8	50.9
89	2.0	1.1	4.1	3.1	30.3	7.7	5.0	53.5
90	2.1	1.2	4.2	3.2	32.8	7.7	5.2	56.5

[1] Impacts are measured as deviations from the situation in which no gas pipeline is built.

[2] * = less than 50 thousand dollars.

Fort Yukon, and 16.5 million more than the Prime Route. Regionally, the distribution of the impact of the construction period is changed, since much of the construction now takes place in the Fairbanks Region. In 1980, Fairbanks receives almost 26 percent of the impact; Interior, 43 percent; and Anchorage, 25 percent. In absolute terms, the gross product impact in 1980 on the Fairbanks region is $64.8 million, which is almost 60 million more than in the closest Trans-Canada case, Fort Yukon, with little difference in the impact on Interior. Therefore, this route would be expected to stimulate the Fairbanks economy in the short run far more than any other Trans-Canada route, with accompanying strains of a boom. It should also be noted that over the longer term to 1990, there is relatively little difference between the Fairbanks Region impact in this case and the Fort Yukon and Prime Routes, which implies a post-construction downturn of major proportions when compared with other routes.

The employment data in Table 55 tend to confirm the pattern described above. In total, the Fairbanks-Alaska Highway Route means almost 24,000 additional jobs in the state in the peak construction year, and about 6.2 thousand in 1990. This is 7,400 more than in the Fort Yukon case and 19,600 more than the Prime Route in 1980, and 800 more than Fort Yukon and 1,900 more than the Prime Route in 1990. The essential difference, both in total and in regional distribution occurs during the construction period. Although the Interior and Anchorage regions follow their by-now-familiar cycles, Fairbanks in this case shows an additional 6,700 workers in 1990, 6,000 more than in the Fort Yukon case, and 28 percent of the total. In

Table 55

FAIRBANKS - ALASKA HIGHWAY ROUTE
IMPACT ON EMPLOYMENT BY REGION AND YEAR[1]
Thousands of Persons

YEAR	NORTHWEST	SOUTHWEST	SOUTHEAST	SOUTHCENTRAL	ANCHORAGE	INTERIOR	FAIRBANKS	TOTAL
1976	*[2]	*	*	*	*	*	*	0.1
77	*	*	0.1	*	0.2	0.4	0.3	1.0
78	*	*	0.2	0.1	0.7	1.4	1.2	3.7
79	0.1	0.1	0.4	0.3	2.5	6.3	5.0	14.6
80	0.3	0.3	1.5	0.9	5.9	8.3	6.7	23.9
81	0.3	0.4	2.0	1.2	5.7	0.3	1.3	11.3
82	0.2	0.2	1.2	0.7	3.3	0.2	0.8	6.6
83	0.2	0.2	1.0	0.6	2.8	0.2	0.7	5.6
84	0.2	0.2	0.9	0.6	2.8	0.2	0.6	5.4
85	0.2	0.2	0.9	0.6	2.8	0.2	0.6	5.4
86	0.2	0.2	0.9	0.6	2.9	0.1	0.6	5.4
87	0.2	0.2	0.9	0.6	3.0	0.2	0.6	5.5
88	0.2	0.2	0.9	0.6	3.2	0.2	0.6	5.7
89	0.2	0.2	0.9	0.6	3.4	0.2	0.6	5.9
90	0.2	0.2	0.9	0.6	3.6	0.2	0.6	6.2

[1] Impacts are measured as deviations from the situation in which no gas pipeline is built.

[2] * = less than 50 persons.

contrast, Anchorage must absorb 5,900 additional workers into its far larger employment base. Interior must absorb the largest amount into the smallest base economy, but this is true of the other Trans-Canada routes, as well. In any case, by 1990, 58 percent or 3,600 jobs are in the Anchorage area, which feels the bulk of the long run impact on employment. In contrast, Interior and Fairbanks have only 3.2 percent and 9.7 percent of the additional pipeline induced employment by 1990, respectively.

The distribution of employment impacts by industry is shown in Table 56. As in the other cases, the Fairbanks-Alaska Highway Route has employment opportunities heavily weighted toward government and the support sector; not, as might be supposed, in oil and gas directly. In 1980, just over 11,000 or 46.4 percent of total employment impact is in support industries, and 16.7 percent in government, while 32.6 percent is in mining and construction. By 1990, the support sector has 48.3 percent of additional employment, government has 22.5 percent, and mining and construction has about five percent. Thus, even at its peak, oil and gas provides only about one-third of the additional employment attributable to building a gas pipeline on the Fairbanks-Alaska Highway Route.

The impact on real wages and salaries paid is shown in Table 57. The total impact in the peak construction year is, as expected, larger than in the other Trans-Canada routes. For example, the 1980 figure is $60.5 million greater than the Fort Yukon Route and $164.8 million greater than the Prime Route. By 1990 the impact declines to $50.8 million, $6.8 million greater than the Fort Yukon Route and $15.6 million greater than

Table 56

FAIRBANKS - ALASKA HIGHWAY ROUTE
IMPACT ON EMPLOYMENT BY INDUSTRY AND YEAR[1]
Thousands of Persons

YEAR	AGRICULTURE, FORESTRY, & FISHERIES	MINING	CONSTRUCTION	MANUFACTURING	TRANSPORTATION, COMMUNICATION, AND UTILITIES	TRADE	FINANCE, INSURANCE, REAL ESTATE	SERVICE	GOVERNMENT	OTHER	TOTAL
1976	0	0	*[2]	0	*	*	*	*	0.1	*	0.1
77	0	0	0.4	0	0.1	0.2	*	0.2	0.2	*	1.0
78	0	0	1.5	0	0.2	0.6	0.1	0.7	0.5	0.2	3.7
79	0	0	5.9	0	0.9	2.9	0.3	2.9	1.1	0.6	14.6
80	0	0.1	7.5	0	1.3	4.5	0.6	4.7	4.0	1.1	23.9
81	0	0.1	0.6	0	0.5	1.6	0.4	1.8	5.4	0.8	11.3
82	0	0.1	0.3	0	0.3	0.9	0.3	1.1	3.1	0.5	6.6
83	0	0.1	0.3	0	0.3	0.8	0.2	1.0	2.5	0.4	5.6
84	0	0.1	0.3	0	0.3	0.8	0.2	1.0	2.4	0.4	5.4
85	0	0.1	0.3	0	0.3	0.8	0.2	1.0	2.3	0.4	5.4
86	0	*	0.3	0	0.3	0.8	0.2	1.1	2.3	0.4	5.4
87	0	*	0.3	0	0.3	0.9	0.3	1.1	2.3	0.4	5.5
88	0	*	0.3	0	0.3	0.9	0.3	1.2	2.2	0.4	5.7
89	0	*	0.3	0	0.3	1.0	0.3	1.3	2.3	0.4	5.9
90	0	*	0.3	0	0.3	1.0	0.3	1.4	2.3	0.4	6.2

[1] Impacts are measured as deviations from the situation in which no gas pipeline is built.

[2] * = less than 50 persons.

Table 57

FAIRBANKS - ALASKA HIGHWAY ROUTE
IMPACT ON REAL WAGES AND SALARIES PAID BY REGION AND YEAR[1]
Millions of 1967 Dollars

YEAR	NORTHWEST	SOUTHWEST	SOUTHEAST	SOUTHCENTRAL	ANCHORAGE	INTERIOR	FAIRBANKS	TOTAL
1976	0	0	0.2	0.1	0.3	0	0.1	0.7
77	0.1	0.1	0.4	0.2	1.5	3.9	3.0	9.1
78	0.2	0.3	1.3	0.7	5.1	14.4	10.8	32.6
79	0.5	0.5	3.0	1.7	17.3	62.7	43.5	129.2
80	1.7	2.0	10.8	6.1	41.1	79.8	58.2	199.6
81	2.3	2.7	14.8	8.3	39.7	2.1	10.4	80.3
82	1.4	1.6	8.7	5.0	23.4	1.7	6.3	48.2
83	1.1	1.4	7.4	4.1	20.5	1.6	5.4	41.5
84	1.1	1.3	7.0	3.9	20.3	1.6	5.2	40.6
85	1.1	1.3	7.0	4.0	20.9	1.6	5.3	41.4
86	1.1	1.4	7.1	4.1	21.8	1.3	5.0	41.8
87	1.1	1.4	7.2	4.1	22.8	1.3	5.1	43.1
88	1.2	1.5	7.4	4.2	24.3	1.3	5.3	45.2
89	1.3	1.5	7.7	4.4	26.1	1.3	5.6	47.7
90	1.3	1.6	8.0	4.6	28.2	1.4	5.7	50.8

[1] Impacts are measured as deviations from the situation in which no gas pipeline is built.

the Prime Route. The regional impact is interesting in that in 1980, Fairbanks and Interior show higher proportions of wages and salaries earned than they show of employment - demonstrating the high pay of construction workers in these areas, and the lower pay of support sector workers in Anchorage. These differences persist in 1990.

Population increases are induced by the additional employment opportunities in the state through immigration. A total population impact of 33.4 thousand is registered in 1980, which is 10,300 more than the Fort Yukon Route and 27,600 more than the Prime Route. The gap narrows considerably by 1990 when the Fairbanks-Alaska Highway Route shows a population impact of 15,300 persons, which is 2,700 more than the Fort Yukon Route and 6,700 more than the Prime Route. Regionally, in the boom year of 1980, Fairbanks' population increases by 11,000 persons as a result of pipeline construction. This is 9,000 more than the Fort Yukon case, and 10,600 more than the Prime Route. The Anchorage impact is only 2,000 larger and is absorbed by a much larger existing population. The transient nature of the impact in Fairbanks and Interior is shown by the fact that the 1990 population impacts in those regions are 1,500 and 100 persons, in comparison with Anchorage, which gets an ultimate impact of 9,300 persons, 61 percent of the 1990 total.

The increase in population in the state means that there will have to be increases in the level of state and local government spending. As shown in Table 59 , there is an increase of $262 million at the height of the construction boom in 1980, which tapers off to $191 million by 1990.

Table 58

FAIRBANKS - ALASKA HIGHWAY ROUTE
IMPACT ON POPULATION BY REGION AND YEAR[1]
Thousands of Persons

YEAR	NORTHWEST	SOUTHWEST	SOUTHEAST	SOUTHCENTRAL	ANCHORAGE	INTERIOR	FAIRBANKS	TOTAL
1976	*[2]	0	*	*	0.1	0	*	0.1
77	*	*	0.1	0.1	0.4	0.2	0.6	1.3
78	*	*	0.3	0.3	1.5	0.6	2.1	4.8
79	0.2	0.2	1.0	1.0	5.9	2.5	8.3	19.1
80	0.3	0.5	2.6	2.8	13.0	3.1	11.1	33.4
81	0.3	0.4	3.1	3.4	11.7	0.2	2.4	21.4
82	0.3	0.5	2.4	2.5	8.7	0.2	2.0	16.5
83	0.3	0.5	2.1	2.2	8.2	0.2	1.8	15.4
84	0.3	0.5	2.1	2.2	8.2	0.2	1.7	15.1
85	0.3	0.4	2.0	2.1	8.2	0.2	1.7	15.0
86	0.3	0.4	2.0	2.1	8.3	0.2	1.6	14.8
87	0.3	0.4	1.9	2.1	8.5	0.2	1.6	14.8
88	0.2	0.4	1.9	2.0	8.7	0.1	1.5	14.9
89	0.2	0.4	1.8	2.0	8.9	0.1	1.5	15.0
90	0.2	0.3	1.8	2.0	9.3	0.1	1.5	15.3

[1] Impacts are measured as deviations from the situation in which no gas pipeline is built.

[2] * = less than 50 persons.

Table 59

FAIRBANKS - ALASKA HIGHWAY ROUTE
IMPACT ON STATE AND LOCAL REVENUES AND EXPENDITURES[1]
Millions of Dollars

YEAR	STATE TOTAL	PETROLEUM REVENUES	PERSONAL AND CORPORATE INCOME TAX	INTEREST INCOME	SPECIAL FUND REVENUE	OTHER GENERAL FUND REVENUE	LOCAL GOV'T REVENUE FROM OWN SOURCES	STATE AND LOCAL GOV'T REVENUE	STATE AND LOCAL GOV'T EXPENDITURES
1976	2.0	2.0	0	0	0	0	0	2.4	2.0
77	5.8	5.6	0.1	0	0.1	0.1	0.3	7.1	6.1
78	21.3	18.2	1.1	0	0.7	1.3	3.0	27.3	19.8
79	44.9	32.7	4.5	0.4	2.6	4.7	12.2	63.3	48.8
80	156.5	104.2	19.4	0.9	12.1	19.8	55.2	232.7	184.9
81	193.2	104.2	32.7	2.7	21.4	32.3	96.1	315.9	261.8
82	146.7	105.4	13.9	4.5	9.2	13.8	41.1	206.2	160.5
83	141.3	111.8	8.7	6.4	5.9	8.6	26.5	184.6	139.0
84	141.7	111.8	8.1	8.4	5.6	7.8	25.2	183.7	138.1
85	144.7	111.8	8.5	10.3	6.1	8.0	27.1	188.6	142.8
86	148.8	111.8	9.3	12.2	6.9	8.7	30.5	196.3	149.9
87	152.9	111.8	10.1	14.2	7.6	8.9	33.8	204.0	157.2
88	157.9	111.8	11.1	16.1	8.7	9.9	38.5	214.2	166.4
89	163.6	111.8	12.5	18.1	10.1	11.1	44.7	226.3	177.7
90	170.1	111.8	14.1	20.0	11.8	12.3	51.8	240.7	190.9

[1] Impacts are measured as deviations from the situation in which no gas pipeline is built.

Even though this is 177 million more than is spent in 1980 in the Prime Route 1990 figure, per capita income falls for the state as a whole.

The fall in per capita income is documented in Table 60 . While personal income earned annually by state residents does increase to $573 million in 1980, declining sharply and growing more slowly to $210 million per year in 1990, the rapid influx of population dissipates the short term gain rather quickly. The Interior Region shows the only long term per capita increase of any consequence, while the areas showing the largest population gains show decreases in per capita income. The only exceptional case is the Fairbanks Region, which initially draws fairly large increases in per capita income. However, unlike the case of Interior where little immigration ultimately results, Fairbanks loses its gains to an increasing, low-paid population.

Point Gravina Route

In contrast to the Trans-Canada routes, Point Gravina shows a much larger impact on the Alaskan economy, regardless of what assumption is made about the level of production. The tables in this and the following sections are based on El Paso Natural Gas Company's assumption of 3.5 billion cubic feet of gas per day at peak production. Also, in contrast to the Trans-Canada routes, except Fairbanks-Alaska Highway, construction will be closer to developed areas of the state. In particular, the Point Gravina Route passes through the Southcentral Region, so this region will show major direct impacts. Anchorage will become a direct support base,

Table 60

FAIRBANKS - ALASKA HIGHWAY ROUTE
IMPACT ON PERSONAL INCOME AND PER CAPITA INCOME BY REGION AND YEAR[1]
Personal Income in Millions of Dollars, Per Capita Income in Dollars

	NORTHWEST		SOUTHWEST		SOUTHEAST		SOUTHCENTRAL		ANCHORAGE		INTERIOR		FAIRBANKS		TOTAL	
YEAR	PERSONAL INCOME	PER CAPITA INCOME	PERSONAL INCOME	PER CAPITA INCOME	PERSONAL INCOME	PER CAPITA INCOME	PERSONAL INCOME	PER CAPITA INCOME	PERSONAL INCOME	PER CAPITA INCOME	PERSONAL INCOME	PER CAPITA INCOME	PERSONAL INCOME	PER CAPITA INCOME	PERSONAL INCOME	PER CAPI INCOME
1976	0.1	6	0.1	3	0.4	4	0.2	1	0.7	1	0	0	0.2	2	1.7	2
77	0	- 3	- 0.1	- 4	0.5	- 4	0.3	- 6	0.2	- 4	12.7	1,012	7.6	180	23.3	33
78	0.1	- 5	- 0.1	- 13	1.5	- 24	0.9	- 29	8.2	- 25	47.9	3,567	28.4	162	86.9	107
79	- 0.2	- 70	- 1.4	- 107	0.5	- 16	0	- 155	25.4	- 149	214.8	14,147	119.0	543	58.2	389
80	1.1	- 91	1.7	- 70	21.0	- 16	14.0	- 201	85.9	- 190	284.3	17,609	164.8	647	572.7	463
81	4.5	98	7.7	137	44.8	92	30.3	- 18	114.6	- 8	8.0	422	31.8	93	241.9	36
82	2.8	- 17	4.7	12	27.1	- 52	18.3	- 84	68.5	- 87	6.6	182	19.8	- 33	147.7	- 63
83	2.4	- 45	4.2	- 15	23.6	- 88	16.0	- 96	62.6	- 104	6.5	168	17.6	- 59	133.0	- 84
84	2.4	- 35	4.3	- 19	23.5	- 96	16.0	- 95	64.4	- 106	6.7	216	17.7	- 65	135.1	- 88
85	2.6	- 22	4.4	- 23	24.4	- 96	16.6	- 94	69.0	- 105	7.1	239	18.5	- 63	142.6	- 87
86	2.8	- 5	4.8	- 15	25.8	- 91	17.6	- 89	74.6	- 102	5.6	128	18.4	- 63	149.5	- 86
87	2.9	- 3	5.1	- 12	27.1	- 86	18.6	- 84	81.3	- 98	5.9	143	19.5	- 58	160.4	- 83
88	3.1	2	5.4	- 7	28.8	- 78	19.9	- 79	89.7	- 94	6.3	162	20.9	- 51	174.1	- 79
89	3.4	16	5.9	5	30.9	- 69	21.3	- 74	100.0	- 90	6.8	203	22.5	- 43	190.7	- 74
90	3.8	35	6.3	15	33.4	- 59	23.1	- 69	112.5	- 84	7.3	248	24.4	- 35	210.7	- 68

[1] Impacts are measured as deviations from the situation in which no gas pipeline is built.

as will Fairbanks. In addition, this route is an LNG route, requiring major docking facilities for ships and a liquefaction plant. Neither of these is required on any Trans-Canada option; and it means that any LNG option will be characterized by higher direct employment and capital value available to tax.

The impact on gross product (value added) is shown in Table 61. The most striking thing about the impact of this route in comparison with the Prime Route is its size. During the peak construction year of 1980, the impact on Alaska's economy is nearly $397 million, which is 356 million more than the Prime Route, or nearly 10 times the impact. Even in comparison with the Fairbanks-Alaska Highway Route, the 1980 impact is about 60 percent larger, or $147 million difference. By 1990, this gap narrows considerably, since the short term employment in construction drops off, and the chief remaining difference between the impact of the Point Gravina and Prime Routes is accounted for by the difference in state revenues and the additional long run employment. By 1990, the impact has gone through a post-construction downturn and has increased again to $287 million per year. This is still 247 million over the Prime Route, but the impact is somewhat lower, being 7.2 times the Prime Route impact. In comparison with the Fairbanks-Alaska Highway alternative, the gap is $230.3 million, and the impact of Point Gravina is 5.1 times that of the highway route, showing that the long run employment and higher state revenues clearly make a difference in the long term impacts.

Table 61

POINT GRAVINA ROUTE
IMPACT ON REAL GROSS PRODUCT BY REGION AND YEAR[1]
Millions of 1958 Dollars

YEAR	NORTHWEST	SOUTHWEST	SOUTHEAST	SOUTHCENTRAL	ANCHORAGE	INTERIOR	FAIRBANKS	TOTAL
1976	*[2]	*	*	*	0.1	*	*	0.2
77	*	*	0.1	*	0.3	*	0.1	0.5
78	0.2	0.1	0.6	5.1	6.9	5.3	14.3	32.4
79	0.7	0.5	2.2	45.1	28.6	22.5	22.8	122.3
80	2.2	1.5	6.8	242.9	63.4	43.9	36.1	396.9
81	3.3	2.1	9.7	218.9	68.7	31.6	28.6	362.9
82	3.4	2.0	8.9	188.0	58.3	29.6	26.4	316.7
83	3.1	1.8	7.9	173.1	47.6	17.4	18.4	269.3
84	2.6	1.6	6.8	169.7	44.2	17.1	17.6	259.7
85	2.6	1.6	6.5	169.7	44.8	17.3	17.6	260.1
86	2.8	1.7	6.8	169.6	49.6	17.4	18.1	265.9
87	3.0	1.8	7.0	169.0	52.4	17.8	18.5	269.5
88	3.2	1.9	7.1	168.7	56.2	18.1	18.9	274.2
89	3.5	2.0	7.3	168.1	60.9	18.1	19.4	279.4
90	3.8	2.1	7.5	168.4	66.8	18.1	20.0	286.8

[1] Impacts are measured as deviations from the situation in which no gas pipeline is built.

[2] * = less than 50 thousand dollars.

The second fact to notice about the impact on state gross product is the much different distribution of effects in this case, compared to the Prime Route. The Prime Route shows major construction period impacts in the Interior and Anchorage Regions only. However, since the Point Gravina pipeline would pass through the Fairbanks and Southcentral Regions, and will require a higher level of support from Anchorage, the Fairbanks construction impact approaches that of Interior, while both the Anchorage and Southcentral impacts are far larger. The percentage distribution of impacts in 1980 for the Point Gravina Route is: Interior, 11 percent; Anchorage, 16 percent; Fairbanks, 9 percent; and Southcentral, 61 percent. However, even though both the construction period relative impacts on Anchorage and Interior are reduced, it should be pointed out that the absolute impacts are larger. Comparing with the Fairbanks-Alaska Highway case, the 1980 impacts on gross product are higher for Point Gravina in the Southcentral and Anchorage areas, lower in the Interior and Fairbanks areas.

As in the Prime Route case, the eventual distribution of output begins to gravitate toward Anchorage. This is because the general economic activity of the state based on state spending eventually overwhelms the transient impact of pipeline construction. However, the relative shift toward Anchorage is not as pronounced in this case because of the new source of long term employment on Prince William Sound near Point Gravina. In 1990, the Southcentral Region shows an impact of $168.4 million, almost 59 percent of the total. Anchorage shows only 23 percent of the impact as compared

with 58 percent in the Prime Route case, but the absolute number in 1990 is roughly twice the Fairbanks-Alaska Highway Route impact, and roughly three times the Prime Route impact. Interior and Fairbanks show 6.3 percent and 6.9 percent of the gross product impact in 1990, respectively. Both absolute numbers are far greater than the Prime Route and even the Fairbanks-Alaska Highway Route. This would still be true, incidentally, even if the pipeline production to Point Gravina were only 2.25 billion cubic feet per day, and even if the wellhead price of gas were zero.

The employment figures shown in Table 62 tend to confirm the large impact on the State of Alaska economy that results from building a pipeline and LNG facility on the Point Gravina Route. In the peak construction year of 1980, the total employment impact is 23,800, about 100 less than the Fairbanks-Alaska Highway Route, and 19,500 more than the Prime Route. By 1990, the larger impact of Point Gravina on long term employment becomes apparent, since the 1990 impact of this route is 12,500 -- about 6,300 more than the Fairbanks-Alaska Highway Route and 8,200 more than the Prime Route. The regional numbers reflect the large construction impact in the Southcentral Region in 1980, which gets 42 percent of the employment impact in that year (compared with 25 percent in Anchorage, 11 percent in Interior, and 13 percent in Fairbanks). Comparing the 1980 employment impacts with the Fairbanks-Alaska Highway Route, the absolute impacts are larger for Point Gravina in the Southcentral Region and Anchorage Region, and smaller in Fairbanks and the Interior. By 1990, all four Point Gravina impacts are larger. This also is true for a comparison with Prime Route impacts in both years.

Table 62

POINT GRAVINA ROUTE
IMPACT ON EMPLOYMENT BY REGION AND YEAR[1]
Thousands of Persons

YEAR	NORTHWEST	SOUTHWEST	SOUTHEAST	SOUTHCENTRAL	ANCHORAGE	INTERIOR	FAIRBANKS	TOTAL
1976	*[2]	*	*	*	*	*	*	*
77	*	*	*	*	*	*	*	0.1
78	*	*	0.1	0.7	0.6	0.5	1.5	3.5
79	0.1	0.1	0.4	6.4	2.4	2.2	2.4	14.0
80	0.2	0.3	1.5	10.0	6.0	2.7	3.1	23.8
81	0.4	0.4	2.1	6.9	7.3	1.6	2.4	21.1
82	0.3	0.4	1.9	3.2	6.4	1.5	2.2	15.9
83	0.3	0.3	1.7	1.6	5.4	0.3	1.3	11.0
84	0.3	0.3	1.5	1.5	4.9	0.3	1.2	9.9
85	0.2	0.3	1.4	1.4	4.9	0.3	1.1	9.7
86	0.3	0.3	1.5	1.5	5.4	0.3	1.2	10.4
87	0.3	0.3	1.5	1.5	5.7	0.3	1.2	10.8
88	0.3	0.3	1.5	1.5	6.0	0.3	1.2	11.2
89	0.3	0.3	1.6	1.6	6.5	0.3	1.2	11.8
90	0.3	0.3	1.6	1.6	7.1	0.3	1.3	12.5

[1] Impacts are measured as deviations from the situation in which no gas pipeline is built.

[2] * = less than 50 persons.

By industry, the employment impacts shown in Table 63 once again indicate that the support sector plays an important role. Even in 1980, support industries include about 9,000 workers, or 38 percent of the total, while mining and construction impacts account for 9,400 or 39 percent, and government, about 16.4 percent or 3,900. Government and support sector industries account for 32 and 51 percent of employment impact by 1990, with construction and mining combined contributing about 10 percent.

The regional distribution of real wages and salaries paid is given by Table 64 . In the peak construction year, 1980, the percentage distribution of real wages and salaries is as follows for the impacted regions: Southcentral, 43.5 percent; Anchorage, 21.4 percent; Interior, 14.5 percent; and Fairbanks, 26.3 percent. Anchorage again shows a lower wages and salaries ratio than the regions in which actual construction is taking place. This again reflects the bias toward the support sectors in Anchorage. By 1990, the same situation prevails, Anchorage showing a larger percentage of employment than it does wages and salaries.

Population increases are induced by new employment opportunities, mainly by net inmigration. Table 65 shows the pattern of Alaskan population impacts which are expected to result from the increases in employment. In the peak construction year of 1980, the increase is expected to be 32,800 persons, of whom 71 percent will make their homes in the Southcentral Region, and 17 percent in Anchorage. This is an enormous impact on the Southcentral Region and is radically different from the picture presented by any of the Trans-Canada routes. This population boom is

Table 63

POINT GRAVINA ROUTE
IMPACT ON EMPLOYMENT BY INDUSTRY AND YEAR[1]
Thousands of Persons

YEAR	AGRICULTURE, FORESTRY, & FISHERIES	MINING	CONSTRUCTION	MANUFACTURING	TRANSPORTATION, COMMUNICATION, AND UTILITIES	TRADE	FINANCE, INSURANCE, REAL ESTATE	SERVICE	GOVERNMENT	OTHER	TOTAL
1976	0	0	*[2]	0	*	*	*	*	*	*	*
77	0	0	*	0	*	*	*	*	*	*	0.1
78	0	0	1.6	0	0.2	0.5	0.1	0.6	0.3	0.2	3.5
79	0	0	6.8	0	0.7	1.7	0.2	2.6	1.2	0.9	14.0
80	0	0.6	8.8	0	1.2	3.0	0.5	4.3	3.9	1.5	23.8
81	0	0.6	5.4	0	1.1	2.8	0.6	3.7	5.5	1.4	21.1
82	0	0.6	2.6	0	0.9	2.3	0.5	2.7	5.1	1.0	15.9
83	0	0.6	0.5	0	0.7	1.6	0.4	1.8	4.5	0.8	11.0
84	0	0.6	0.5	0	0.6	1.5	0.4	1.7	3.9	0.7	9.9
85	0	0.6	0.5	0	0.6	1.5	0.4	1.8	3.7	0.7	9.7
86	0	0.6	0.5	0	0.7	1.6	0.5	2.0	3.8	0.7	10.4
87	0	0.6	0.5	0	0.7	1.7	0.5	2.1	3.9	0.7	10.8
88	0	0.6	0.6	0	0.7	1.8	0.5	2.3	3.9	0.8	11.2
89	0	0.6	0.6	0	0.8	2.0	0.6	2.5	4.0	0.8	11.8
90	0	0.6	0.6	0	0.8	2.1	0.7	2.8	4.0	0.8	12.5

[1] Impacts are measured as deviations from the situation in which no gas pipeline is built.

[2] * = less than 50 persons.

Table 64

POINT GRAVINA ROUTE
IMPACT ON REAL WAGES AND SALARIES PAID BY REGION AND YEAR[1]
Millions of 1967 Dollars

YEAR	NORTHWEST	SOUTHWEST	SOUTHEAST	SOUTHCENTRAL	ANCHORAGE	INTERIOR	FAIRBANKS	TOTAL
1976	0	0	0.1	0	0.1	0	0	0.2
77	0	0	0.1	0.1	0.3	0	0.1	0.5
78	0.1	0.2	0.9	6.0	4.0	5.8	13.2	30.2
79	0.5	0.6	3.1	53.5	16.6	23.6	21.1	119.0
80	1.6	2.0	10.3	84.2	41.4	28.1	26.3	193.7
81	2.4	2.8	15.2	57.6	50.7	16.4	20.1	165.1
82	2.3	2.6	14.3	26.3	45.3	14.5	18.0	123.4
83	2.0	2.4	13.0	12.9	39.1	2.5	10.6	82.7
84	1.8	2.2	11.4	12.2	36.1	2.5	9.7	75.8
85	1.8	2.1	11.2	12.2	36.4	2.4	9.6	75.8
86	1.9	2.3	11.8	12.7	40.3	2.6	10.1	81.6
87	2.0	2.4	12.4	13.1	43.0	2.7	10.5	86.0
88	2.1	2.5	12.8	13.5	46.3	2.7	11.0	90.9
89	2.3	2.7	13.4	13.9	50.2	2.8	11.5	96.7
90	2.4	2.8	14.1	14.5	55.2	2.9	12.1	103.9

[1] Impacts are measured as deviations from the situation in which no gas pipeline is built.

Table 65

POINT GRAVINA ROUTE
IMPACT ON POPULATION BY REGION AND YEAR[1]
Thousands of Persons

YEAR	NORTHWEST	SOUTHWEST	SOUTHEAST	SOUTHCENTRAL	ANCHORAGE	INTERIOR	FAIRBANKS	TOTAL
1976	0	0	*[2]	*	0	0	0	0
77	*	0	*	*	0.1	0	*	0.1
78	- *	- 0.1	- *	1.7	0.4	0.2	2.3	4.4
79	- 0.2	- 0.5	- 0.5	14.8	0.9	0.8	2.8	18.1
80	- 0.2	- 0.5	0.4	23.2	5.7	0.9	3.3	32.8
81	*	- 0.1	2.0	16.7	10.7	0.6	3.0	32.9
82	0.3	0.4	2.8	8.4	12.8	0.7	3.6	29.0
83	0.4	0.5	3.0	4.8	12.8	0.2	2.7	24.5
84	0.4	0.6	2.8	4.5	12.4	0.2	2.6	23.6
85	0.4	0.6	2.8	4.5	12.6	0.2	2.6	23.6
86	0.4	0.5	2.8	4.6	13.4	0.2	2.6	24.5
87	0.4	0.5	2.8	4.7	14.0	0.2	2.6	25.2
88	0.3	0.5	2.8	4.7	14.6	0.2	2.6	25.9
89	0.3	0.5	2.8	4.8	15.5	0.2	2.6	26.8
90	0.3	0.5	2.8	4.9	16.5	0.2	2.7	27.9

[1] Impacts are measured as deviations from the situation in which no gas pipeline is built.

[2] * = less than 50 persons.

quite shortlived, moreover, and the total impact on the Southcentral Region declines to 4,900 persons (17.6 percent of the total) by 1990, while Anchorage's impact increases to 16,500 persons, or 59 percent of the total. Thus, Southcentral is expected to see a major boom and bust in population growth which may work considerable strain on the social fabric of the communities of the region. The other regions show greater growth than in the Prime Route case, and larger even than the Fairbanks-Alaska Highway case by 1990.

The state and local governments can and do spend many millions of dollars if the Point Gravina Route is developed, to provide public services. By 1980, these governmental units are spending an additional $177 million per year, and by 1990, this total has increased to $338 million. (See Table 66 .) However, as can be seen by the summary section on impacts (Table 25), the per capita increase is not large, and immigration to the state dissipates the gains. There are not per capita losses of personal income overall.

To see the size and distribution of impacts on personal and per capita income, consider Table 67 . The increase in total personal income is $556 million in 1980, the peak of the construction boom, and the long term impact in 1990 is $431 million. This represents 446 million more than the Prime Route in 1980, although it is 17 million less than the Fairbanks-Alaska Highway Route in that year. By 1990, Point Gravina shows an impact about three times that of the Prime Route and more than twice that of the Alaska Highway Route, revealing the larger long term base provided

Table 66

POINT GRAVINA ROUTE
IMPACT ON STATE AND LOCAL REVENUES AND EXPENDITURES[1]
Millions of Dollars

YEAR	STATE TOTAL	PETROLEUM REVENUES	PERSONAL AND CORPORATE INCOME TAX	INTEREST INCOME	SPECIAL FUND REVENUE	OTHER GENERAL FUND REVENUE	LOCAL GOV'T REVENUE FROM OWN SOURCES	STATE AND LOCAL GOV'T REVENUE	STATE AND LOCAL GOV't EXPENDITURES
1976	0.7	0.7	0	0	0	0	0	0.8	0.7
77	1.6	1.5	0	0	0	0	0.1	2.0	1.7
78	17.1	16.9	0	0	0.1	0.1	0.2	19.6	13.1
79	48.4	37.2	4.1	0.3	2.4	4.3	11.2	66.2	50.2
80	152.7	104.5	17.9	1.0	11.1	18.2	50.7	223.8	176.7
81	207.3	120.8	31.7	2.8	20.7	31.4	93.2	328.6	268.7
82	212.8	132.2	28.6	4.9	19.0	28.1	85.3	325.5	263.1
83	216.2	148.8	22.6	7.2	15.5	22.1	69.1	311.9	246.2
84	216.8	163.9	16.2	9.8	11.4	15.5	50.6	293.2	224.9
85	219.3	164.3	16.0	12.6	11.5	15.1	50.9	295.8	227.2
86	238.5	177.4	17.1	15.5	12.7	15.8	56.1	321.9	247.8
87	249.1	177.4	19.9	18.6	15.1	18.2	66.9	344.2	268.5
88	259.0	177.4	22.1	21.7	17.5	20.0	77.2	365.5	288.0
89	270.2	177.4	25.2	24.8	20.5	22.3	90.0	390.4	311.0
90	283.2	177.4	28.7	27.9	24.1	25.3	105.5	420.2	338.4

[1] Impacts are measured as deviations from the situation in which no gas pipeline is built.

Table 67

PT. GRAVINA ROUTE
IMPACT ON PERSONAL INCOME AND PER CAPITA INCOME BY REGION AND YEAR[1]
Personal Income in Millions of Dollars, Per Capita Income in Dollars

	NORTHWEST		SOUTHWEST		SOUTHEAST		SOUTHCENTRAL		ANCHORAGE		INTERIOR		FAIRBANKS		TOTAL	
YEAR	PERSONAL INCOME	PER CAPITA INCOME	PERSONAL INCOME	PER CAPITA INCOME	PERSONAL INCOME	PER CAPITA INCOME	PERSONAL INCOME	PER CAPITA INCOME	PERSONAL INCOME	PER CAPITA INCOME	PERSONAL INCOME	PER CAPITA INCOME	PERSONAL INCOME	PER CAPITA INCOME	PERSONAL INCOME	PER CAPI INCOME
1976	0	0	0	0	0.1	1	0.1	1	0.3	1	0	0	0.1	1	0.6	1
77	0	- 1	0	0	0.2	1	0.1	- 1	0.6	1	0.1	11	0.2	2	1.4	2
78	0	12	- 0.2	14	0.7	20	18.9	96	6.2	14	19.1	1,546	35.5	251	80.1	100
79	- 0.5	45	- 1.8	59	- 0.4	88	179.5	687	20.0	58	79.7	6,385	53.2	414	329.9	347
80	4.0	144	0.5	162	17.3	195	292.6	939	79.7	102	98.2	7,682	66.9	491	555.7	442
81	3.3	178	5.8	214	38.9	203	204.3	641	126.8	84	60.2	4,653	55.3	342	494.5	295
82	4.0	73	6.9	116	41.2	49	95.7	212	124.4	- 33	56.1	3,906	53.8	183	381.8	121
83	4.2	18	7.3	63	41.3	- 25	49.8	28	118.0	- 82	10.2	435	34.2	21	264.9	- 35
84	3.9	5	6.8	28	37.7	- 69	48.7	11	112.6	- 107	10.2	442	32.2	- 16	252.1	- 64
85	4.0	7	6.8	12	38.1	- 85	50.4	7	118.3	- 115	10.7	451	33.1	- 26	261.4	- 75
86	4.6	40	7.7	29	42.2	- 71	54.6	17	136.9	- 109	11.5	506	36.5	- 13	293.7	- 66
87	4.9	44	8.4	35	45.5	- 70	58.5	18	150.6	- 111	12.3	534	39.5	- 9	319.6	- 68
88	5.3	51	9.0	39	49.0	- 64	62.6	22	168.2	- 110	13.2	569	42.6	- 3	349.9	- 68
89	5.8	69	10.0	53	53.2	- 54	67.2	27	189.9	- 108	14.1	622	46.3	6	386.5	- 64
90	6.5	95	11.0	79	58.2	- 40	72.6	34	217.1	- 103	15.2	703	50.6	17	431.1	- 57

[1] Impacts are measured as deviations from the situation in which no gas pipeline is built.

by long run employment and state revenues in the Point Gravina case. Nevertheless, inmigration after the construction results in net per capita income losses for the Alaska population taken as a whole within two years.

The personal income effects are not evenly distributed across the state's economic regions. Generally speaking, those regions which either have little net migration (Northwest, Southwest), or which have direct employment in oil and gas (Interior, Southcentral, Fairbanks) show per capita income increases of varying size by 1990. The major support base, Anchorage, shows losses of per capita income to lower-paid support sector employees' and non-working dependents' immigration. Fairbanks is a marginal case. As a construction area, it shows major income gains. However, it is also a support base, and shows the results of population inmigration as well, only yielding a net per capita income increase late in the 1980's. Interior once again demonstrates the impact of adding a number of highly paid workers to a thin, low-paid population base. Southcentral shows a small gain, one of only two cases for which this is true. This demonstrates the relative importance not only of increased employment, but the type of employment necessary to increase a region's per capita income.

Fairbanks-Haines Route

The Fairbanks-Haines Route is really a hybrid of the Fairbanks-Alaska Highway alternative and an LNG route such as Point Gravina. Its impacts are of the order of magnitude presented by the Point Gravina Route, but

distributed more like the Alaska Highway Route. The exception is that a major LNG facility is built at Haines in the Southeast Region, which results in a much larger impact for the Southeast on this route than any other.

For example, consider the impacts on real gross state product presented in Table 68 . The total impact in 1980 is $292 million, which is about halfway between the impacts of the Alaska Highway and Point Gravina Routes. By 1990, the impact is still $216 million, almost four times the impact of the Fairbanks-Alaska Highway Route, and about 75 percent of the impact of the Point Gravina Route. The 1980 impact is seven times that of the Prime Route and in 1990, the impact is 5.4 times that of the Prime Route.

The impact, as distributed regionally, shows nearly 43 percent of the construction period impact in the Southeast, while 22 percent is in Anchorage, 12.6 percent in the Interior, and 19.3 percent in the Fairbanks Region. In absolute terms, the impacts are larger in each of these regions (except Interior) than they are for the Point Gravina Route. The impact is also larger than the Alaska Highway Route impact in Anchorage, but smaller in Interior and Fairbanks Regions. By 1990, the impact on gross product for this route is at least as large as that for Point Gravina in Anchorage, Interior, and Fairbanks, and is much larger in the Southeast. Of course, it is much smaller in the Southcentral Region, which accounts for the smaller state total. The absolute 1990 impacts are larger than the Alaska Highway Route gross product impacts for all regions.

Table 68

FAIRBANKS - HAINES ROUTE
IMPACT ON REAL GROSS PRODUCT BY REGION AND YEAR[1]
Millions of 1958 Dollars

YEAR	NORTHWEST	SOUTHWEST	SOUTHEAST	SOUTHCENTRAL	ANCHORAGE	INTERIOR	FAIRBANKS	TOTAL
1976	*[2]	*	*	*	0.1	*	*	0.3
77	*	*	0.1	0.1	0.3	*	0.1	0.5
78	0.2	0.2	2.3	0.5	7.4	5.3	19.0	34.8
79	0.8	0.5	38.0	1.7	30.3	17.8	37.1	126.2
80	2.3	1.6	124.7	5.1	65.0	36.8	56.5	292.0
81	3.4	2.2	77.7	7.2	54.5	18.4	25.2	188.5
82	2.6	1.5	77.5	4.9	39.1	17.7	22.3	165.6
83	2.5	1.5	82.2	4.6	38.8	17.2	22.0	168.8
84	2.5	1.6	84.6	4.8	42.0	17.1	22.6	175.2
85	2.7	1.6	87.4	4.9	44.7	17.3	22.9	181.6
86	2.9	1.8	88.8	5.2	50.2	17.4	23.6	189.9
87	3.2	1.9	89.9	5.4	53.3	17.8	24.1	195.6
88	3.4	2.0	91.1	5.5	57.3	18.1	24.6	202.0
89	3.7	2.1	92.1	5.7	62.0	18.2	25.1	208.9
90	4.0	2.2	92.5	6.0	67.7	18.1	25.8	216.3

[1] Impacts are measured as deviations from the situation in which no gas pipeline is built.

[2] * = less than 50 thousand dollars.

The employment impacts presented in Table 69 tend to confirm the picture of large transient economic impacts in the regions where the pipeline and LNG facilities are actually being built and slightly smaller, more permanent impacts in the major urban centers of the state after the construction boom is over. In 1980, the total employment impact is 24,300, slightly more than either Point Gravina or the Alaska Highway Route, and 20,000 more than the Prime Route. Regionally, the largest impact is in the Southeast, which gets 40.3 percent of additional employment. This compares with 25.5 percent in Anchorage, 8.6 percent in Interior, and 19.3 percent in Fairbanks. The absolute numbers are larger than Alaska Highway numbers, as expected, in the Southeast and Anchorage. These feel the immediate large construction impact. Because of the different manning requirements and pattern of employment on a pipeline and LNG option, Interior and Fairbanks show smaller construction period impacts when the Fairbanks-Haines Route is compared to the Alaska Highway Route. By 1990, most of the longer term employment settles in Anchorage. In that year, 55.8 percent of employment impacts are accounted for by the Anchorage Region, while Southeast gets only 17.8 percent. All regions show larger impacts than the Fairbanks-Alaska Highway Route or the Point Gravina Route, although the latter are about the same.

The industry-by-industry distribution of employment impacts is shown in Table 70 . Except in the peak construction years, the employment in support industries and government is larger than that of construction and mining, where direct pipeline employment takes place. In 1980, 39 percent

Table 69

FAIRBANKS - HAINES ROUTE
IMPACT ON EMPLOYMENT BY REGION AND YEAR[1]
Thousands of Persons

YEAR	NORTHWEST	SOUTHWEST	SOUTHEAST	SOUTHCENTRAL	ANCHORAGE	INTERIOR	FAIRBANKS	TOTAL
1976	*[2]	*	*	*	*	*	*	*
77	*	*	*	*	*	*	*	0.1
78	*	*	0.4	0.1	0.6	0.5	2.0	3.7
79	0.1	0.1	5.6	0.3	2.6	1.8	3.9	14.3
80	0.3	0.3	9.8	0.9	6.2	2.1	4.7	24.3
81	0.4	0.4	2.8	1.3	6.4	0.4	1.4	13.4
82	0.3	0.3	2.1	0.9	4.5	0.3	1.2	9.6
83	0.2	0.3	2.0	0.8	4.4	0.3	1.2	9.1
84	0.2	0.3	2.0	0.8	4.7	0.3	1.2	9.6
85	0.2	0.3	2.0	0.9	4.9	0.3	1.2	9.9
86	0.3	0.3	2.1	0.9	5.5	0.3	1.3	10.7
87	0.3	0.3	2.2	1.0	5.8	0.3	1.3	11.2
88	0.3	0.3	2.2	1.0	6.2	0.3	1.4	11.6
89	0.3	0.3	2.2	1.0	6.6	0.3	1.4	12.2
90	0.3	0.4	2.3	1.1	7.2	0.3	1.4	12.9

[1] Impacts are measured as deviations from the situation in which no gas pipeline is built.

[2] * = less than 50 persons.

Table 70

FAIRBANKS - HAINES ROUTE
IMPACT ON EMPLOYMENT BY INDUSTRY AND YEAR[1]
Thousands of Persons

YEAR	AGRICULTURE, FORESTRY, & FISHERIES	MINING	CONSTRUCTION	MANUFACTURING	TRANSPORTATION, COMMUNICATION, AND UTILITIES	TRADE	FINANCE, INSURANCE, REAL ESTATE	SERVICE	GOVERNMENT	OTHER	TOTAL
1976	0	0	*[2]	0	*	*	*	*	*	*	*
77	0	0	*	0	*	*	*	*	*	*	0.1
78	0	0	1.6	0	0.3	0.6	0.1	0.5	0.4	0.2	3.7
79	0	0	6.7	0	0.8	2.2	0.4	2.0	1.3	0.9	14.3
80	0	0.6	8.9	0	1.2	3.7	0.7	3.4	4.1	1.6	24.3
81	0	0.6	0.7	0	0.7	1.9	0.5	2.1	5.9	1.0	13.4
82	0	0.6	0.5	0	0.5	1.4	0.4	1.5	4.0	0.7	9.6
83	0	0.6	0.5	0	0.5	1.4	0.4	1.5	3.6	0.6	9.1
84	0	0.6	0.5	0	0.5	1.5	0.4	1.7	3.7	0.7	9.6
85	0	0.6	0.5	0	0.5	1.5	0.4	1.8	3.8	0.7	9.9
86	0	0.6	0.6	0	0.6	1.7	0.5	2.1	3.9	0.7	10.7
87	0	0.6	0.6	0	0.6	1.8	0.5	2.2	4.0	0.8	11.2
88	0	0.6	0.7	0	0.6	1.9	0.6	2.4	4.1	0.8	11.6
89	0	0.6	0.7	0	0.7	2.0	0.6	2.6	4.1	0.8	12.2
90	0	0.6	0.7	0	0.7	2.2	0.7	2.9	4.2	0.9	12.9

[1] Impacts are measured as deviations from the situation in which no gas pipeline is built.

[2] * = less than 50 persons.

or 9,500 people are directly employed in mining and construction on the pipeline and related projects. By 1990, this has declined to 10 percent. In contrast, the support sector grows from 37 percent to 50.3 percent, and government from 16.8 percent to 32.6 percent.

The regional distribution of real income from pipeline development is related to the wages and salaries distribution presented in Table 71. Although Anchorage shows 25.5 percent of employment impacts in 1980, only 21 percent of additional wages and salaries are paid there. This reflects the average lower salaries in the support base areas. Southeast, Interior, and Fairbanks show salary percentages higher than employment percentages because of the generally higher pay in the pipeline construction areas. This picture does not change in 1990. The generally lower wages and salaries in the support bases for the state result in per capita income losses when extensive migration takes place into these areas. This result is confirmed in the discussion of personal income, below.

The increased employment opportunities in each region result in migrations of workers and their dependents into the region. Except in the peak construction years, however, when a large and transient population impact occurs in regions having pipeline and facilities construction, most of the population impact occurs in and around Anchorage. For example, in 1990, about 60 percent of the population impact is shown by Table 72 to be centered in Anchorage. This is exactly the same population as the Point Gravina Route, and three times the Prime Route impact. In the peak construction year of 1980, however, Southeast shows a 12,900 person population impact,

Table 71

FAIRBANKS - HAINES ROUTE
IMPACT ON REAL WAGES AND SALARIES PAID BY REGION AND YEAR[1]
Millions of 1967 Dollars

YEAR	NORTHWEST	SOUTHWEST	SOUTHEAST	SOUTHCENTRAL	ANCHORAGE	INTERIOR	FAIRBANKS	TOTAL
1976	0	0	0.1	0	0.1	0	0	0.3
77	0	0	0.2	0.1	0.3	0	0.1	0.6
78	0.2	0.2	3.1	0.5	4.4	5.8	17.6	31.7
79	0.5	0.6	50.4	1.9	17.8	19.0	34.1	124.4
80	1.7	2.1	87.9	6.2	42.6	21.4	40.9	202.5
81	2.5	3.0	21.3	9.0	45.0	2.7	13.3	96.7
82	1.8	2.0	16.4	6.3	31.8	2.4	10.0	70.9
83	1.6	2.0	15.9	5.9	31.4	2.3	9.6	68.9
84	1.7	2.1	16.5	6.2	34.2	2.4	10.2	73.4
85	1.8	2.2	17.0	6.6	36.4	2.5	10.6	77.0
86	2.0	2.4	17.8	7.1	40.9	2.6	11.2	84.0
87	2.1	2.5	18.6	7.4	43.8	2.7	11.8	88.8
88	2.2	2.6	19.1	7.7	47.3	2.8	12.2	93.9
89	2.4	2.8	19.8	8.0	51.3	2.8	12.8	99.8
90	2.5	2.9	20.6	8.5	56.2	3.0	13.4	107.0

[1] Impacts are measured as deviations from the situation in which no gas pipeline is built.

Table 72

FAIRBANKS - HAINES ROUTE
IMPACT ON POPULATION BY REGION AND YEAR[1]
Thousands of Persons

YEAR	NORTHWEST	SOUTHWEST	SOUTHEAST	SOUTHCENTRAL	ANCHORAGE	INTERIOR	FAIRBANKS	TOTAL
1976	0	0	*[2]	*	*	0	*	0.1
77	*	0	*	*	0.1	0	*	0.1
78	- *	- *	0.4	0.1	0.8	0.2	3.2	4.6
79	- *	- 0.1	7.4	0.5	3.9	0.8	5.9	18.5
80	0.1	0.1	12.9	2.0	10.4	0.9	7.1	33.5
81	0.3	0.4	4.0	3.5	12.6	0.2	2.8	23.8
82	0.3	0.5	3.4	2.9	10.4	0.2	2.5	20.2
83	0.3	0.5	3.3	2.8	10.6	0.2	2.5	20.2
84	0.3	0.5	3.4	2.9	11.3	0.2	2.6	21.2
85	0.3	0.5	3.4	2.9	11.9	0.2	2.6	22.0
86	0.3	0.5	3.5	3.1	13.0	0.2	2.7	23.2
87	0.3	0.5	3.6	3.2	13.7	0.2	2.7	24.2
88	0.3	0.5	3.6	3.2	14.5	0.2	2.7	25.1
89	0.3	0.5	3,6	3.3	15.4	0.2	2.8	26.1
90	0.3	0.5	3.6	3.4	16.5	0.2	2.8	27.4

[1] Impacts are measured as deviations from the situation in which no gas pipeline is built.

[2] * = less than 50 persons.

about 38.5 percent of the total, and Fairbanks has a one year impact of 7,100 persons, 21 percent of the total. By 1990, these have declined relative to Anchorage and absolutely, the end year percentages being 13.1 percent and 10.2 percent, respectively.

State and local governments will spend large sums in the Fairbanks-Haines scenario to meet additional demands for public services. As shown in Table 73 , this spending reaches $187.5 million in 1980, and peaks at $353.4 million in 1990. This is not large in per capita terms after population begins to grow, however, as was shown in Table 25 , and the state is unable to prevent a decline in per capita income toward the end of the period, even though state and local spending is at 2.7 times the pace in the case of the Prime Route, where no such decline takes place.

The impact on personal income and per capita income is documented in Table 74 for the Fairbanks-Haines Route. Again, the regions showing direct construction and increased oil and gas employment also show long term per capita income increases. These are substantial in Interior and much smaller in Southeast and Fairbanks, which also have immigration with which to contend. The Northwest and Southwest regions get a portion of the general state spending but do not experience immigration, so they show small per capita income increases. Neither Southcentral nor Anchorage get many highly paid construction or oil and gas workers; the low incomes of the many immigrants and their dependents account for the per capita income losses in these regions and the state as a whole. Overall, in comparison with the Prime Route, the 1980 impact on personal income is $481 million larger,

Table 73

FAIRBANKS - HAINES ROUTE
IMPACT ON STATE AND LOCAL REVENUES AND EXPENDITURES[1]
Millions of Dollars

YEAR	STATE TOTAL	PETROLEUM REVENUES	PERSONAL AND CORPORATE INCOME TAX	INTEREST INCOME	SPECIAL FUND REVENUE	OTHER GENERAL FUND REVENUE	LOCAL GOV'T REVENUE FROM OWN SOURCES	STATE AND LOCAL GOV'T REVENUE	STATE AND LOCAL GOV'T EXPENDITURES
1976	0.8	0.8	0	0	0	0	0	0.8	0.8
77	1.7	1.6	0.1	0	0	0	0.1	2.1	1.8
78	19.9	19.7	0	0	0.1	0.2	0.2	22.8	15.2
79	55.2	43.4	4.4	0.4	2.6	4.5	11.9	74.5	56.0
80	163.3	112.7	18.7	1.1	11.7	19.0	53.1	238.2	187.5
81	221.0	130.3	33.2	3.1	21.7	32.8	97.6	348.5	284.3
82	191.8	142.2	16.7	5.3	11.0	16.5	49.5	265.2	204.6
83	200.8	158.8	12.9	7.9	8.8	12.6	39.1	263.9	199.0
84	220.4	173.9	13.5	10.7	9.4	13.0	42.0	288.4	217.5
85	229.0	174.3	15.4	13.6	11.1	14.5	49.3	304.8	232.7
86	250.4	187.4	17.3	16.7	12.9	16.1	57.0	336.0	258.0
87	262.0	187.4	20.4	20.0	15.6	18.7	68.8	360.5	280.7
88	272.4	187.4	22.9	23.2	18.1	20.6	79.7	382.9	301.3
89	284.2	187.4	25.9	26.5	21.2	23.0	93.0	408.9	325.2
90	297.6	187.4	29.6	29.8	24.8	25.9	108.9	439.6	353.4

[1] Impacts are measured as deviations from the situation in which no gas pipeline is built.

Table 74

FAIRBANKS - HAINES ROUTE
IMPACT ON PERSONAL INCOME AND PER CAPITA INCOME BY REGION AND YEAR[1]
Personal Income in Millions of Dollars, Per Capita Income in Dollars

	NORTHWEST		SOUTHWEST		SOUTHEAST		SOUTHCENTRAL		ANCHORAGE		INTERIOR		FAIRBANKS		TOTAL	
YEAR	PERSONAL INCOME	PER CAPITA INCOME	PERSONAL INCOME	PER CAPITA INCOME	PERSONAL INCOME	PER CAPITA INCOME	PERSONAL INCOME	PER CAPITA INCOME	PERSONAL INCOME	PER CAPITA INCOME	PERSONAL INCOME	PER CAPITA INCOME	PERSONAL INCOME	PER CAPITA INCOME	PERSONAL INCOME	PER CAPITA INCOME
1976	0	0	0	0	0.2	2	0.1	1	0.3	1	0	0	0.1	1	0.7	1
77	0	- 1	0	0	0.3	2	0.2	1	0.7	2	0.1	11	0.2	2	1.5	2
78	0.1	11	0	11	7.3	56	0.9	3	8.5	9	19.3	1,534	48.0	320	84.2	106
79	0.3	18	0.1	20	141.1	833	3.7	- 11	38.0	4	65.7	5,086	96.0	567	345.0	372
80	2.1	74	3.4	94	256.7	1,234	18.1	- 16	105.8	9	76.7	5,713	118.2	613	581.0	477
81	4.9	129	8.3	167	64.5	208	32.8	1	129.3	15	10.3	633	40.6	157	290.7	85
82	3.5	23	6.0	60	51.1	77	23.3	- 60	93.3	- 58	9.4	425	31.4	44	217.9	- 6
83	3.5	5	6.0	42	51.3	44	22.9	- 72	95.9	- 76	9.6	423	31.5	22	220.6	- 27
84	3.9	28	6.7	48	55.4	41	25.2	- 71	108.2	- 80	10.2	498	34.4	23	244.1	- 28
85	4.2	37	7.2	46	59.0	34	27.1	- 74	120.0	- 84	10.9	523	37.1	24	265.4	- 33
86	4.8	66	8.2	63	64.9	47	30.5	- 67	140.8	- 80	11.8	578	41.3	37	302.1	- 25
87	5.2	72	9.0	68	69.7	45	33.2	- 69	155.6	- 85	12.6	599	44.7	37	329.9	- 30
88	5.7	81	9.7	71	74.5	47	35.9	- 69	174.0	- 88	13.5	626	48.2	40	361.5	- 33
89	6.2	94	10.7	87	80.1	53	39.0	- 68	196.2	- 89	14.5	680	61.2	45	398.8	- 33
90	6.9	117	11.7	103	86.5	64	42.8	- 65	223.5	- 88	15.6	751	56.9	53	443.8	- 29

[1] Impacts are measured as deviations from the situation in which no gas pipeline is built.

and in 1990, $298 million larger. However, while the Fairbanks-Haines increase in statewide per capita income is $390 larger in 1980, by 1990 the Fairbanks-Haines Route shows a net per capita loss. This loss is smaller than that experienced in either the Point Gravina or Alaska Highway case but, overall, the essential difference in these cases is the intrastate distribution of gains and losses.

Cook Inlet Route

The Cook Inlet Route passes near Anchorage and through the South-central Region, to end in an LNG facility on the Kenai Peninsula. Consequently, it is quite similar to the Point Gravina Route in impact but affects Anchorage directly more than any other route. Consequently, it reinforces the tendency for development to take place in or near Anchorage.

The level and distribution of real gross state product are shown in Table 75 . In 1980, the peak construction year, the total impact on value added is almost $422 million per year. This is about 25 million more than Point Gravina, the closest competitor, and 381 million more than the Prime Route. By 1990, the impact is smaller -- 310.5 million -- but it still is nearly $24 million more than Point Gravina and $271 million more than the Prime Route. In the peak construction year, every region except Fairbanks shows a higher value added than in the Point Gravina case, while the impact is several times that for the Prime Route in every region. By 1990, this picture does not change. The major difference is that the relative size of the Cook Inlet impacts compared to the other two cases are slightly smaller.

Table 75

COOK INLET ROUTE
IMPACT ON REAL GROSS PRODUCT BY REGION AND YEAR[1]
Millions of 1958 Dollars

YEAR	NORTHWEST	SOUTHWEST	SOUTHEAST	SOUTHCENTRAL	ANCHORAGE	INTERIOR	FAIRBANKS	TOTAL
1976	*[2]	*	*	*	0.1	*	*	0.2
77	*	*	0.1	*	0.3	*	0.1	0.5
78	0.2	0.1	0.6	10.3	8.8	5.3	5.7	31.0
79	0.7	0.5	2.2	51.5	36.7	22.5	8.9	123.0
80	2.2	1.5	7.0	272.7	74.0	43.9	20.3	421.7
81	3.4	2.2	9.9	246.6	76.0	31.7	19.0	388.7
82	3.4	2.1	9.1	216.0	61.8	29.6	16.6	338.6
83	3.1	1.8	8.0	196.1	50.2	17.4	15.9	292.6
84	2.7	1.6	6.9	192.4	46.8	17.1	15.1	282.6
85	2.7	1.6	6.7	192.4	47.5	17.3	15.0	283.1
86	2.9	1.7	6.9	192.2	52.3	17.4	15.5	289.0
87	3.1	1.8	7.1	191.6	55.3	17.8	16.0	292.6
88	3.3	1.9	7.2	191.2	59.3	18.1	16.4	297.4
89	3.6	2.0	7.4	190.6	64.1	18.1	16.9	302.8
90	3.9	2.2	7.7	190.9	70.3	18.1	17.5	310.5

[1] Impacts are measured as deviations from the situation in which no gas pipeline is built.

[2] * = less than 50 thousand dollars.

The emphasis on development in Anchorage and Southcentral Regions also comes through in the employment figures presented in Table 76. The peak construction year impact of 24,500 is larger than Point Gravina and is 5.7 times that of the Prime Route. It is larger than both other routes' totals in every region, exceeding Point Gravina by 900 workers in Southcentral and by 1,100 workers in Anchorage. By 1990, the gap narrows, and Cook Inlet exceeds Point Gravina employment only in Anchorage and Southcentral, and only by a small margin. In 1980, 44 percent of employment impact occurs in Southcentral and 29 percent in Anchorage. By 1990, 56.6 percent appears in Anchorage and 13.1 percent in Southcentral, virtually the same as Point Gravina employment.

As in every other case examined thus far, most of the employment impact occurs in the government and support sectors by the end of the period. Even in the peak construction year of 1980, the support sector industries feel an impact of 9,300 additional workers (38 percent of the increase) as opposed to 9,600 construction and mining workers (39 percent of the increase.) Government has 16 percent of the newly available jobs in 1980; however, by 1990 this increases to 32 percent as the total employment impact declines to 12,900. The corresponding percentage figures for mining and construction combined and for the support sector are 10 percent and 51 percent, respectively.

The tendency for the support sector employment to be concentrated in the Anchorage area is pointed out by comparing the real wages and salaries presented in Table 77 with the employment percentages in Table 78.

Table 76

COOK INLET ROUTE
IMPACT ON EMPLOYMENT BY REGION AND YEAR[1]
Thousands of Persons

YEAR	NORTHWEST	SOUTHWEST	SOUTHEAST	SOUTHCENTRAL	ANCHORAGE	INTERIOR	FAIRBANKS	TOTAL
1976	*[2]	*	*	*	*	*	*	*
77	*	*	*	*	*	*	*	0.1
78	*	*	0.1	1.5	0.8	0.5	0.6	3.6
79	0.1	0.1	0.5	7.3	3.4	2.2	1.0	14.5
80	0.3	0.3	1.5	10.9	7.1	2.8	1.7	24.5
81	0.4	0.4	2.1	7.5	8.0	1.6	1.7	21.8
82	0.3	0.4	2.0	3.9	6.7	1.5	1.4	16.2
83	0.3	0.3	1.7	1.7	5.6	0.3	1.3	11.3
84	0.3	0.3	1.5	1.6	5.1	0.3	1.1	10.2
85	0.2	0.3	1.4	1.5	5.1	0.3	1.1	10.0
86	0.3	0.3	1.5	1.6	5.6	0.3	1.1	10.6
87	0.3	0.3	1.5	1.6	5.9	0.3	1.2	11.1
88	0.3	0.3	1.6	1.6	6.2	0.3	1.2	11.5
89	0.3	0.3	1.6	1.7	6.7	0.3	1.2	12.1
90	0.3	0.3	1.6	1.7	7.3	0.3	1.3	12.9

[1] Impacts are measured as deviations from the situation in which no gas pipeline is built.

[2] * = less than 50 persons.

Table 77

COOK INLET ROUTE
IMPACT ON REAL WAGES AND SALARIES PAID BY REGION AND YEAR[1]
Millions of 1967 Dollars

YEAR	NORTHWEST	SOUTHWEST	SOUTHEAST	SOUTHCENTRAL	ANCHORAGE	INTERIOR	FAIRBANKS	TOTAL
1976	0	0	0.1	0	0.1	0	0	0.2
77	0	0	0.1	0.1	0.3	0	0.1	0.5
78	0.1	0.2	0.9	12.2	5.7	5.8	5.3	30.3
79	0.5	0.6	3.2	61.1	23.8	23.6	8.4	121.3
80	1.7	2.0	10.5	91.8	49.8	28.1	14.0	197.6
81	2.4	2.9	15.5	62.9	56.1	16.4	13.4	169.5
82	2.3	2.7	14.7	32.4	47.2	14.5	11.2	125.2
83	2.1	2.5	13.2	13.7	40.3	2.5	10.3	84.7
84	1.8	2.2	11.6	13.0	37.2	2.5	9.4	77.9
85	1.8	2.2	11.4	13.1	37.7	2.5	9.3	78.0
86	1.9	2.3	12.0	13.6	41.7	2.6	9.8	83.9
87	2.0	2.4	12.6	14.0	44.4	2.7	10.3	88.4
88	2.2	2.6	13.0	14.4	47.8	2.8	10.7	93.5
89	2.3	2.7	13.7	14.9	52.0	2.8	11.3	99.6
90	2.4	2.8	14.4	15.5	57.2	2.9	11.8	107.0

[1] Impacts are measured as deviations from the situation in which no gas pipeline is built.

Table 78

COOK INLET ROUTE
IMPACT ON EMPLOYMENT BY INDUSTRY AND YEAR[1]
Thousands of Persons

YEAR	AGRICULTURE, FORESTRY, & FISHERIES	MINING	CONSTRUCTION	MANUFACTURING	TRANSPORTATION, COMMUNICATION, AND UTILITIES	TRADE	FINANCE, INSURANCE, REAL ESTATE	SERVICE	GOVERNMENT	OTHER	TOTAL
1976	0	0	*[2]	0	*	*	*	*	*	*	*
77	0	0	*	0	*	*	*	*	*	*	0.1
78	0	0	1.7	0	0.2	0.5	0.1	0.6	0.3	0.2	3.6
79	0	0	7.0	0	0.6	1.7	0.3	2.8	1.2	0.9	14.5
80	0	0.6	9.0	0	1.1	3.1	0.5	4.6	3.9	1.6	24.5
81	0	0.6	5.6	0	1.1	2.9	0.6	3.9	5.7	1.5	21.8
82	0	0.6	2.7	0	0.9	2.3	0.5	2.9	5.2	1.1	16.2
83	0	0.6	0.6	0	0.7	1.7	0.4	1.9	4.6	0.8	11.3
84	0	0.6	0.5	0	0.6	1.5	0.4	1.8	3.9	0.7	10.2
85	0	0.6	0.5	0	0.6	1.6	0.4	1.8	3.8	0.7	10.0
86	0	0.6	0.5	0	0.7	1.7	0.5	2.0	3.9	0.7	10.6
87	0	0.6	0.6	0	0.7	1.8	0.5	2.2	3.9	0.8	11.1
88	0	0.6	0.6	0	0.7	1.9	0.6	2.4	4.0	0.8	11.5
89	0	0.6	0.6	0	0.8	2.0	0.6	2.6	4.0	0.8	12.1
90	0	0.6	0.7	0	0.8	2.2	0.7	2.9	4.1	0.9	12.9

[1] Impacts are measured as deviations from the situation in which no gas pipeline is built.

[2] * = less than 50 persons.

In 1980, Anchorage has 29 percent of new employment attributable to pipeline construction. However, only 25.2 percent of new wages and salaries are paid in the Anchorage Region, showing a bias toward lower paying jobs. By 1990, 56.5 percent of new jobs are in the Anchorage Region, but only 53.4 percent of new wages and salaries. The opposite is the case in regions showing higher percentages of oil and gas workers; e.g., Southcentral in 1990 has 13.2 percent of the employment impact, but 14.4 percent of the impact on real wages and salaries.

The prospect of employment draws new population from the Lower 48 and elsewhere, as shown in Table 79 . The building of a pipeline on the Cook Inlet Route increases the state's population by 33,600 in 1980; by 1990 the long term impact on population is 28,600. This is about 800 people more than the Point Gravina Route, and exceeds the Prime Route impact by nearly 28,000 in 1980 and 20,000 in 1990. Except for the peak construction years, most of the population increase takes place in the Anchorage Region. For example, in 1990 Anchorage gets 59 percent of the new population. The transient nature of the construction impact is shown by the fact that in 1980, nearly 75 percent of the population impact, 25,100 people, is felt in the Southcentral Region. By 1990, the impact is only 5,100 persons, or 17.8 percent.

Population increases must be met by additional state and local spending if the quality of services is not to deteriorate. In the Cook Inlet case, as shown in Table 80, total state and local spending rises by $345.5 million. This is seven million more than the Point Gravina Route and 213.5

Table 79

COOK INLET ROUTE
IMPACT ON POPULATION BY REGION AND YEAR[1]
Thousands of Persons

YEAR	NORTHWEST	SOUTHWEST	SOUTHEAST	SOUTHCENTRAL	ANCHORAGE	INTERIOR	FAIRBANKS	TOTAL
1976	0	0	*[2]	*	*	0	*	*
77	*	0	*	*	0.1	0	*	0.1
78	- 0.1	- 0.1	- 0.2	3.5	0.5	0.2	0.7	4.5
79	- 0.2	- 0.5	- 0.7	16.9	2.2	0.8	0.3	18.7
80	- 0.3	- 0.6	0.2	25.1	7.3	0.9	1.0	33.6
81	- *	- 0.1	1.9	18.1	11.7	0.6	1.7	33.8
82	0.2	0.3	2.8	10.1	13.0	0.7	2.3	29.6
83	0.4	0.5	3.1	5.0	13.1	0.2	2.7	25.0
84	0.4	0.6	2.9	4.8	12.7	0.2	2.6	24.1
85	0.4	0.6	2.8	4.7	12.9	0.2	2.5	24.1
86	0.4	0.5	2.8	4.8	13.7	0.2	2.5	25.1
87	0.4	0.5	2.9	4.9	14.3	0.2	2.6	25.8
88	0.4	0.5	2.9	5.0	15.0	0.2	2.6	26.5
89	0.3	0.5	2.9	5.0	15.9	0.2	2.6	27.4
90	0.3	0.5	2.9	5.1	16.9	0.2	2.6	28.6

[1] Impacts are measured as deviations from the situation in which no gas pipeline is built.

[2] * = less than 50 persons.

Table 80

COOK INLET ROUTE
IMPACT ON STATE AND LOCAL REVENUES AND EXPENDITURES[1]
Millions of Dollars

YEAR	STATE TOTAL	PETROLEUM REVENUES	PERSONAL AND CORPORATE INCOME TAX	INTEREST INCOME	SPECIAL FUND REVENUE	OTHER GENERAL FUND REVENUE	LOCAL GOV'T REVENUE FROM OWN SOURCES	STATE AND LOCAL GOV'T REVENUE	STATE AND LOCAL GOV'T EXPENDITURES
1976	0.7	0.7	0	0	0	0	0	0.8	0.7
77	1.6	1.5	0	0	0	0	0.1	2.0	1.7
78	17.7	17.5	0	0	0.1	0.1	0.2	20.3	13.5
79	49.8	38.5	4.1	0.3	2.4	4.4	11.2	67.8	51.3
80	155.4	106.2	18.2	1.0	11.4	18.6	51.7	72.5	179.8
81	211.0	122.7	32.3	2.8	21.2	32.0	95.2	334.8	273.9
82	217.1	134.2	29.4	5.0	19.5	28.9	87.6	332.8	269.3
83	219.4	150.8	23.1	7.4	15.8	22.5	70.5	316.9	250.3
84	220.1	165.9	16.7	10.0	11.6	15.9	51.9	298.2	228.9
85	222.9	166.5	16.4	12.8	11.8	15.4	52.3	301.2	231.6
86	242.0	179.4	17.6	15.8	13.1	16.4	57.8	327.5	252.4
87	252.9	179.4	20.4	18.9	15.5	18.6	68.8	350.3	273.5
88	263.0	179.4	22.8	22.0	18.0	20.5	79.4	372.1	293.5
89	274.5	179.4	25.8	25.2	21.1	23.0	92.6	397.8	317.2
90	287.8	179.4	29.6	28.3	24.8	25.8	108.5	428.5	345.5

[1] Impacts are measures as deviations from the situation in which no gas pipeline is built.

million more than the Prime Route; however, Table 25 showed that in per capita terms, the increase is not significant and in several parts of the state, governments are unable to prevent a decline in per capita income.

The decline in per capita income over the long term is documented in Table 81. In the short term, Alaska's per capita income rises in response to the construction boom by some $446 per head. However, population increases dissipate this gain, and there is a net per capita income loss of $56 per capita; this despite a total increase of 1990 personal income amounting to $444 million. The loss is approximately the same as that shown by the Point Gravina Route, and neither is very significant, although in real terms both would be somewhat larger. The impact is not evenly distributed either. Except for the peak construction period, when Anchorage is directly impacted by pipeline construction, Alaska's major urban center acts as a support base, employing increasing numbers of support sector workers and providing residences for immigrants. Consequently, Anchorage shows the largest per capita income. Fairbanks and the Southeast, the other general support centers for Alaska's economic activity, show smaller per capita losses or slight gains. Southcentral suffers population increases; however, because of the increased oil and gas employment, it shows a slight per capita income increase. The large gains are registered in the areas which have very little population immigration - Northwest, Southwest, and Interior.

Table 81

COOK INLET ROUTE
IMPACT ON PERSONAL INCOME AND PER CAPITA INCOME BY REGION AND YEAR[1]
Personal Income in Millions of Dollars, Per Capita Income in Dollars

	NORTHWEST		SOUTHWEST		SOUTHEAST		SOUTHCENTRAL		ANCHORAGE		INTERIOR		FAIRBANKS		TOTAL	
EAR	PERSONAL INCOME	PER CAPITA INCOME	PERSONAL INCOME	PER CAPITA INCOME	PERSONAL INCOME	PER CAPITA INCOME	PERSONAL INCOME	PER CAPITA INCOME	PERSONAL INCOME	PER CAPITA INCOME	PERSONAL INCOME	PER CAPITA INCOME	PERSONAL INCOME	PER CAPITA INCOME	PERSONAL INCOME	PER CAPITA INCOME
976	0	0	0	0	0.1	1	0.1	1	0.3	1	0	0	0.1	1	0.6	1
77	0	- 1	0	0	0.2	1	0.1	- 1	0.6	1	0.1	11	0.2	2	1.4	2
78	- 0.1	15	- 0.4	19	0.2	30	39.4	197	9.3	26	18.9	1,565	12.9	115	80.4	93
79	- 0.5	60	- 2.0	73	- 0.8	111	205.5	778	38.5	89	79.6	6,450	15.9	211	336.1	347
80	0.4	165	0.4	180	17.3	221	319.2	1,020	102.1	133	98.1	7,751	29.6	306	567.0	446
81	3.3	192	5.8	228	39.5	225	223.3	706	141.4	104	60.2	4,699	34.8	248	508.4	303
82	4.0	83	7.0	129	42.0	67	118.5	292	129.4	- 21	56.1	3,938	32.2	85	389.0	123
83	4.3	22	7.4	66	42.0	- 22	53.0	41	121.5	- 81	10.2	435	33.3	17	271.7	- 33
84	4.0	9	6.9	30	38.3	- 68	52.2	26	116.2	- 106	10.3	453	31.2	- 21	259.0	- 63
85	4.1	11	6.9	14	38.8	- 83	54.1	22	122.2	- 115	10.7	448	32.1	- 30	263.9	- 74
86	4.6	38	7.8	31	42.9	- 70	58.4	30	141.2	- 109	11.6	513	35.5	- 17	301.9	- 66
87	5.0	48	8.5	36	46.3	- 68	62.5	31	155.5	- 111	12.3	531	38.4	- 14	328.6	- 67
88	5.4	55	9.2	44	49.9	- 62	66.9	36	173.7	- 110	13.2	565	41.5	- 7	359.9	- 67
89	5.9	71	10.2	62	54.2	- 52	71.8	41	196.2	- 107	14.2	629	45.1	1	397.7	- 63
90	6.7	103	11.2	83	59.4	- 37	77.5	49	224.5	- 103	15.3	710	49.5	14	444.0	- 56

[1] Impacts are measured as deviations from the situation in which no gas pipeline is built.

Golovin Route

The Golovin Route initially follows the same corridor as the other LNG routes; then it abruptly swings west and emerges on Norton Sound. The significant economic differences between this and the other LNG routes are that there is no direct construction impact in the state's more populous regions (e.g., Fairbanks), and that there is both a large construction and permanent employment impact on the Northwest Region. This is the only route which impacts the Northwest directly.

The large impact on the Northwest becomes immediately obvious if one considers Table 82. In the peak construction year of 1980, over $250 million (56.2 percent) of the impact on value added accrues to the Northwest. This is $249 million more than the Point Gravina Route and about $250 million more than the Prime Route. By 1990, this regional difference is 64 million more than Point Gravina and 66.3 million more than the Prime Route. The value added impact is smaller than the impact of the Point Gravina Route by $96 million in 1990, even though the construction period impact is larger by about $50 million. This is because of the relatively isolated nature of construction activity in the Northwest Region of the state. It is nearly as convenient to support such activity from outside the state as within the state, and most Northwest LNG activity will be relatively insulated from most of the Alaska economy. Petroleum revenues will be about the same as the other LNG cases, as will be shown later. It is the distribution of output which provides the apparently strange results in Table 82.

Table 82

GOLOVIN ROUTE
IMPACT ON GROSS PRODUCT BY REGION AND YEAR[1]
Millions of 1958 Dollars

YEAR	NORTHWEST	SOUTHWEST	SOUTHEAST	SOUTHCENTRAL	ANCHORAGE	INTERIOR	FAIRBANKS	TOTAL
1976	*[2]	*	*	*	0.1	*	*	0.2
77	*	*	0.1	*	0.3	*	0.1	0.5
78	3.4	0.1	0.6	0.4	7.5	23.6	0.5	36.1
79	95.4	0.5	2.3	1.6	34.0	62.9	2.0	198.8
80	251.5	1.7	7.7	5.4	73.9	99.2	7.8	447.2
81	180.1	2.5	11.2	7.9	79.7	59.9	11.4	352.6
82	94.0	2.3	10.1	7.2	64.9	57.3	10.6	246.3
83	73.1	1.9	8.4	6.0	49.6	33.1	9.2	181.4
84	70.5	1.6	7.0	5.0	43.8	32.6	8.0	168.5
85	69.0	1.6	6.6	4.8	43.5	33.0	7.8	166.2
86	66.9	1.7	6.7	5.0	47.8	33.1	8.2	169.5
87	67.5	1.8	6.9	5.1	50.4	33.8	8.6	174.1
88	68.5	1.9	7.0	5.2	54.0	34.3	8.9	179.9
89	68.0	2.0	7.2	5.4	58.3	34.4	9.4	184.7
90	67.8	2.1	7.4	5.6	63.6	34.2	10.0	190.8

[1] Impacts are measured as deviations from the situation in which no gas pipeline is built.

[2] * = less than 50 thousand dollars.

Employment is concentrated in the Northwest only during the construction period. Following construction, employment opportunities are generated mostly in the Anchorage area. As shown in Table 83 , the Northwest has 8,700 workers in peak construction year, or 33.8 percent of total employment impact. Anchorage and Interior have 26.8 percent and 24.1 percent, respectively. By 1990, Anchorage's absolute total has remained about the same -- 6,800 workers -- but in percentage terms, this represents 56.2 percent of the total, while Northwest and Interior have only 5.8 percent and 4.1 percent, respectively. The total impact of 25,700 during construction is about 2,000 larger than the Point Gravina and 21,000 larger than the Prime Route. However, by 1990 the smaller multiplier effect of this route becomes apparent as the employment impact for the Golovin Route is 400 persons smaller than the Point Gravina case.

In this case, as in all the others, much of the employment impact is concentrated in the government and support sectors. Even in the peak construction year of 1980, construction and mining together account for only 36.2 percent of the employment increase. Support industries account for 43.6 percent of the impact, while government accounts for 17.1 percent. By 1990, these percentages are 10.7 percent, 49.6 percent, and 33.1 percent, with government's absolute total holding fairly constant and the other totals declining considerably. Even so, this route shows larger impacts in every industry than the Prime Route.

The impacts on real wages and salaries paid, shown in Table 85 demonstrate that the increase in Anchorage area employment is an increase

Table 83

GOLOVIN ROUTE
IMPACT ON EMPLOYMENT BY REGION AND YEAR[1]
Thousands of Persons

YEAR	NORTHWEST	SOUTHWEST	SOUTHEAST	SOUTHCENTRAL	ANCHORAGE	INTERIOR	FAIRBANKS	TOTAL
1976	*[2]	*	*	*	*	*	*	*
77	*	*	*	*	*	*	*	0.1
78	0.3	*	0.1	0.1	0.6	2.3	0.1	3.5
79	5.1	0.1	0.5	0.3	2.8	5.7	0.3	14.8
80	8.7	0.3	1.6	1.0	6.9	6.2	1.1	25.7
81	5.9	0.5	2.4	1.5	8.4	2.9	1.6	23.2
82	2.0	0.4	2.2	1.3	7.1	2.7	1.5	17.2
83	0.7	0.4	1.8	1.1	5.7	0.5	1.2	11.5
84	0.7	0.3	1.5	0.9	4.9	0.4	1.0	9.8
85	0.7	0.3	1.4	0.9	4.8	0.4	1.0	9.5
86	0.7	0.3	1.5	0.9	5.2	0.5	1.0	10.1
87	0.7	0.3	1.5	0.9	5.5	0.5	1.1	10.4
88	0.7	0.3	1.5	1.0	5.8	0.5	1.1	10.8
89	0.7	0.3	1.5	1.0	6.2	0.5	1.1	11.4
90	0.7	0.3	1.6	1.0	6.8	0.5	1.2	12.1

[1] Impacts are measured as deviations from the situation in which no gas pipeline is built.

[2] * = less than 50 persons.

Table 84

GOLOVIN ROUTE
IMPACT ON EMPLOYMENT BY INDUSTRY AND YEAR[1]
Thousands of Persons

YEAR	AGRICULTURE, FORESTRY, & FISHERIES	MINING	CONSTRUCTION	MANUFACTURING	TRANSPORTATION, COMMUNICATION, AND UTILITIES	TRADE	FINANCE, INSURANCE, REAL ESTATE	SERVICE	GOVERNMENT	OTHER	TOTAL
1976	0	0	*[2]	0	*	*	*	*	*	*	*
77	0	0	*	0	*	*	*	*	*	*	0.1
78	0	0	1.5	0	0.2	0.7	*	0.7	0.3	0.1	3.5
79	0	0	6.5	0	1.8	2.2	0.2	2.5	1.2	0.3	14.8
80	0	0.6	8.7	0	3.3	3.6	0.5	3.8	4.4	0.9	25.7
81	0	0.6	5.5	0	2.4	3.1	0.7	3.4	6.4	1.1	23.2
82	0	0.6	2.6	0	1.1	2.6	0.6	3.0	5.8	0.9	17.2
83	0	0.6	0.6	0	0.6	1.7	0.5	2.0	4.8	0.8	11.5
84	0	0.6	0.5	0	0.5	1.5	0.4	1.7	4.0	0.6	9.8
85	0	0.6	0.5	0	0.5	1.4	0.4	1.7	3.7	0.6	9.5
86	0	0.6	0.5	0	0.5	1.6	0.5	1.9	3.8	0.6	10.1
87	0	0.6	0.6	0	0.6	1.6	0.5	2.1	3.8	0.7	10.4
88	0	0.6	0.5	0	0.6	1.7	0.5	2.2	3.9	0.7	10.8
89	0	0.6	0.6	0	0.6	1.9	0.6	2.5	3.9	0.7	11.4
90	0	0.6	0.7	0	0.7	2.0	0.6	2.7	4.0	0.8	12.1

[1] Impacts are measured as deviations from the situation in which no gas pipeline is built.

[2] * = less than 50 persons.

Table 85

GOLOVIN ROUTE
IMPACT ON REAL WAGES AND SALARIES PAID BY REGION AND YEAR[1]
Millions of 1967 Dollars

YEAR	NORTHWEST	SOUTHWEST	SOUTHEAST	SOUTHCENTRAL	ANCHORAGE	INTERIOR	FAIRBANKS	TOTAL
1976	0	0	0.1	0	0.1	0	0	0.2
77	0	0	0.1	0	0.3	0	0.1	0.5
78	3.1	0.2	0.9	0.4	4.3	24.2	0.5	33.5
79	60.8	0.6	3.3	1.8	19.2	57.9	2.1	145.7
80	101.4	2.2	11.6	6.6	47.5	60.5	8.5	238.0
81	69.1	3.3	17.5	9.9	58.5	28.9	12.5	199.6
82	21.9	3.0	16.2	9.2	50.5	26.8	11.7	139.3
83	7.5	2.6	13.9	7.8	40.9	4.1	10.1	87.0
84	7.3	2.2	11.7	6.6	35.8	4.0	8.7	76.4
85	7.3	2.1	11.2	6.4	35.5	4.0	8.5	75.2
86	7.5	2.3	11.8	6.8	39.0	4.2	9.0	80.4
87	7.6	2.4	12.3	7.0	41.5	4.3	9.4	84.4
88	7.8	2.5	12.7	7.3	44.6	4.4	9.7	89.0
89	8.0	2.7	13.3	7.6	48.3	4.5	10.3	94.5
90	8.2	2.7	13.9	8.0	52.9	4.6	10.7	101.5

[1] Impacts are measured as deviations from the situation in which no gas pipeline is built.

biased toward lower-paid support sector jobs. While Anchorage registers 56.2 percent of the increase in 1990 employment over the "no pipeline case", only 52.1 percent of additional real wages and salaries are paid to Anchorage Region workers. The opposite is true in areas showing greater numbers of oil and gas workers and higher-paid government workers. Northwest has 5.8 percent of the 1990 employment impact but 8.1 percent of wages and salaries impacts. This bias is true in the construction years as well.

The increased employment opportunities draw new people to the State of Alaska in this case just as in all other cases. The population increases in this case tend to occur in construction areas in the short term, and in the Anchorage Region in the long term. As can be seen in Table 86, however, even in the peak construction year of 1980, Anchorage gains 47.8 percent of the population increase of the whole state, about 17,200 persons. Compared with 1980, only Anchorage and the Southcentral Regions show absolute population growth, with Anchorage capturing 60.7 percent, or 17,600 persons. By contrast, Northwest gains 5,400 people in 1980 over the case where no pipeline is built, or 15 percent of the state total. This declines to 700 people, or 2.4 percent, by 1990. The total impact on population is 1,100 persons more than the Point Gravina Route in 1990. The difference is a higher impact on Anchorage, Southeast, and Northwest Regions, and a smaller impact on the Southcentral Region. The population increase for this route in 1990 is the highest of any route.

Because of the smaller level of general economic activity in Alaska with this route compared to other LNG options, state and local government

Table 86

GOLOVIN ROUTE
IMPACT ON POPULATION BY REGION AND YEAR[1]
Thousands of Persons

YEAR	NORTHWEST	SOUTHWEST	SOUTHEAST	SOUTHCENTRAL	ANCHORAGE	INTERIOR	FAIRBANKS	TOTAL
1976	0	0	*[2]	*	*	0	*	*
77	*	0	*	*	0.1	0	*	0.1
78	0.3	0.1	0.4	0.4	1.8	1.1	0.3	4.3
79	4.1	0.5	1.5	1.4	8.0	2.4	1.3	19.2
80	5.4	0.8	3.5	3.6	17.2	2.6	2.9	36.0
81	3.8	0.8	4.3	4.6	19.1	1.4	3.4	37.3
82	1.5	0.8	4.2	4.8	17.5	1.3	3.4	33.2
83	0.8	0.8	3.7	4.0	15.1	0.4	3.1	27.8
84	0.8	0.8	3.4	3.6	14.2	0.4	2.9	26.2
85	0.8	0.8	3.3	3.5	14.2	0.4	2.9	25.9
86	0.8	0.7	3.3	3.5	14.9	0.4	2.8	26.5
87	0.8	0.7	3.3	3.6	15.4	0.4	2.8	27.0
88	0.7	0.7	3.3	3.7	16.0	0.4	2.8	27.5
89	0.7	0.7	3.3	3.6	16.7	0.4	2.8	28.2
90	0.7	0.6	3.2	3.7	17.6	0.4	2.8	29.0

[1] Impacts are measured as deviations from the situation in which no gas pipeline is built.

[2] * = less than 50 persons.

spending would not be as high if the same spending rules were followed. These governmental units spend at a higher rate over the construction period for the Golovin Route than for Point Gravina (compare Table 87 with Table 66), but by 1990, $4.2 million per year more is being spent in the Point Gravina case.

Not surprisingly, the Golovin Route shows per capita income losses for the State of Alaska as a whole over the long term. Even though total personal incomes earned reach a peak of $683 million in 1980 (the largest of any case), and still hold at $419.7 million in 1990, the ultimate per capita impact is a $100 loss (more in real terms) by 1990. The transient per capita increase of $630 per person in Alaska during the construction period will not stand up under the increase in population immigration in the 1980's and the exit of oil and gas construction jobs. As before, the impact is not evenly distributed across the state. The Northwest and Interior Regions benefit substantially from the gas line even on a per capita basis, largely because there is little immigration and a vast increase in production and the tax base. On the other hand, the main support bases for the line -- Anchorage, Southcentral Region, and Fairbanks, -- show net per capita losses, as does the Southeast, apparently because of population increases combined with somewhat lower spending rates per capita.

Summary

In summary, no route gives a substantial boost to Alaska's per capita income over the long term, largely because the state cannot close its borders

Table 87

GOLOVIN ROUTE
IMPACT ON STATE AND LOCAL REVENUES AND EXPENDITURES[1]
Millions of Dollars

YEAR	STATE TOTAL	PETROLEUM REVENUES	PERSONAL AND CORPORATE INCOME TAX	INTEREST INCOME	SPECIAL FUND REVENUE	OTHER GENERAL FUND REVENUE	LOCAL GOV'T REVENUE FROM OWN SOURCES	STATE AND LOCAL GOV'T REVENUE	STATE AND LOCAL GOV'T EXPENDITURES
1976	0.7	0.7	0	0	0	0	0	0.8	0.7
77	1.6	1.5	0	0	0	0	0.1	2.0	1.7
78	17.1	16.9	0	0	0.1	0.1	0.2	19.6	13.1
79	49.7	37.3	4.6	0.3	2.7	4.8	12.5	69.0	52.8
80	163.4	104.5	22.0	1.0	13.7	22.3	62.3	247.9	198.9
81	226.9	120.8	39.1	2.8	25.7	38.6	115.4	373.5	310.2
82	228.8	132.0	34.7	4.9	23.1	34.1	103.6	362.3	297.2
83	224.2	148.8	25.7	7.2	17.6	25.0	78.5	330.5	263.4
84	219.2	163.9	17.2	9.8	12.0	16.4	53.3	298.7	229.9
85	219.7	164.3	16.1	12.6	11.6	15.1	51.3	296.6	228.0
86	238.1	177.4	17.0	15.5	12.6	15.7	55.7	320.9	246.9
87	248.3	177.4	19.5	18.6	14.9	17.8	65.9	342.3	266.7
88	257.9	177.4	21.8	21.7	17.2	19.6	75.7	362.8	285.5
89	268.8	177.4	24.6	24.8	20.0	21.8	88.2	386.9	307.7
90	281.4	177.4	28.1	27.9	23.5	24.5	102.9	415.7	334.2

[1] Impacts are measured as deviations from the situation in which no gas pipeline is built.

Table 88

GOLOVIN ROUTE
IMPACT ON PERSONAL INCOME AND PER CAPITA INCOME BY REGION AND YEAR[1]
Personal Income in Millions of Dollars, Per Capita Income in Dollars

	NORTHWEST		SOUTHWEST		SOUTHEAST		SOUTHCENTRAL		ANCHORAGE		INTERIOR		FAIRBANKS		TOTAL	
YEAR	PERSONAL INCOME	PER CAPITA INCOME	PERSONAL INCOME	PER CAPITA INCOME	PERSONAL INCOME	PER CAPITA INCOME	PERSONAL INCOME	PER CAPITA INCOME	PERSONAL INCOME	PER CAPITA INCOME	PERSONAL INCOME	PER CAPITA INCOME	PERSONAL INCOME	PER CAPITA INCOME	PERSONAL INCOME	PER CAPITA INCOME
1976	0	0	0	0	0.1	0	0.1	1	0.3	1	0	0	0.1	1	0.6	1
77	0	- 1	0	0	0.2	1	0.1	- 1	0.6	1	0.1	11	0.2	2	1.4	2
78	5.3	248	- 0.4	- 40	- 0.1	- 66	- 0.2	- 60	4.8	- 58	80.4	5,736	- 0.6	- 57	89.1	123
79	115.4	4,795	1.8	- 54	10.8	- 92	7.2	- 99	57.4	- 87	203.5	13,412	7.4	- 81	403.7	488
80	199.6	6,891	7.4	28	41.0	- 24	27.7	- 99	152.9	- 78	224.3	14,234	30.2	- 12	683.0	630
81	140.7	4,944	11.3	158	60.6	102	40.8	- 27	188.5	- 8	112.2	7,530	44.1	107	598.2	404
82	45.5	1,523	9.0	56	51.0	- 50	34.4	- 121	150.3	- 120	105.3	7,005	37.0	- 21	432.3	128
83	16.3	413	8.2	21	45.8	- 91	30.9	- 129	127.3	- 138	17.0	762	33.7	- 51	279.3	- 79
84	16.4	432	7.3	- 30	40.1	- 150	27.1	- 153	115.9	- 169	17.1	798	30.2	- 99	254.2	- 110
85	17.1	464	7.3	- 46	39.9	- 168	27.1	- 158	119.4	- 177	17.9	820	30.5	- 111	259.1	- 127
86	18.3	531	8.2	- 30	43.7	- 154	29.7	- 149	136.8	- 170	19.1	905	33.6	- 98	289.3	- 117
87	19.3	556	8.8	- 28	47.0	- 150	32.1	- 147	150.0	- 170	20.3	947	36.2	- 94	313.7	- 116
88	20.4	580	9.5	- 20	50.4	- 143	34.6	- 141	167.0	- 167	21.7	1,003	39.0	- 86	342.7	- 114
89	21.7	626	10.4	- 3	54.6	- 131	37.5	- 136	187.8	- 163	23.2	1,105	42.4	- 76	377.5	- 108
90	23.2	681	11.4	19	59.5	- 115	41.1	- 128	213.5	- 157	24.7	1,207	46.5	- 63	419.7	- 99

[1] Impacts are measured as deviations from the situation in which no gas pipeline is built.

to inmigrants over the long term. Within the state, however, living conditions and the nature of the economic base in the more remote regions may sharply reduce population increases. If so, then these regions may enjoy fairly substantial increases in per capita income. The increases in employment are usually far greater in the LNG cases and the increases in output greater still, but all routes show a strong construction peak, a post-construction downturn in growth, and a more general growth period centering on Anchorage. The LNG routes show greater total impacts; nevertheless, the construction impact on a given region is almost always increased by building a pipeline through the region. The long run impact for every route centers on Anchorage. Finally, while construction and mining have a large transitory impact in some cases on the Alaskan economy, it is how and where the state spends its petroleum revenues in the long run which will ultimately tell the size and the distribution of economic effects of North Slope gas in Alaska.

III. SENSITIVITY TESTS

A. SENSITIVITY OF THE RESULTS TO ALTERNATIVE PRODUCTION LEVELS

The El Paso and Arctic Gas proposals are based upon different assumed levels of production, with El Paso the more optimistic of the two. Since the level of production would be the same no matter which route is finally built, runs were done of the MAP model for the LNG routes using the Arctic Gas assumption of 2.25 billion cubic feet per day throughput, and for the Trans-Canada routes using the El Paso assumption of 3.5 billion cubic feet per day, in order to compare the proposals at high and low productions. The results of the lower production case are reported here to show the impact of altering El Paso's assumption concerning production, but very similar relationships between the Trans-Canada and LNG options hold at the higher production rate. The State of Alaska is now considering limiting production from Prudhoe Bay to 2.0 billion cubic feet per day, so the comparison of the options at 2.25 billion is also closer to reality.

With respect to gross product, the Trans-Canada routes look more favorable when LNG route production is assumed to be 2.25 billion cubic feet per day. Table 89 demonstrates the change in gross product by year for each of the LNG options in comparison with the Trans-Canada options. It is apparent that even though gross product is reduced by about $14 - $15 million in each of the LNG cases, the total impact in each case is

Table 89

COMPARISON OF LNG OPTIONS AT DIFFERENT
LEVELS OF PRODUCTION WITH THE TRANS-CANADA OPTIONS
GROSS PRODUCT IMPACT
(Millions of 1958 Dollars)

Route and Level of Production

	PT. GRAVINA		FAIRBANKS-HAINES		COOK INLET		GOLOVIN	
YEAR	3.5 bcf	2.25 bcf	3.5 bcf	2.25 bcf	3.5 bcf	2.25 bcf	3.5 bcf	2.25 bcf
1976	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.2
77	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
78	32.4	32.4	34.8	34.8	31.0	31.0	36.1	36.1
79	122.3	122.3	126.2	126.2	123.0	123.0	198.8	198.8
80	396.9	399.2	292.0	294.4	421.7	424.0	447.2	449.7
81	362.9	365.2	188.5	190.8	388.7	390.9	352.6	354.9
82	316.7	317.7	165.6	166.6	338.6	339.6	246.3	247.4
83	269.3	267.9	168.8	167.3	292.6	291.1	181.4	179.9
84	259.7	254.5	175.2	169.9	282.6	277.3	168.5	163.3
85	260.1	253.4	181.6	174.9	283.1	276.4	166.2	159.6
86	265.9	255.9	189.9	180.0	289.0	277.7	169.5	159.5
87	269.5	258.0	195.6	184.2	292.6	280.6	174.1	162.7
88	274.2	261.7	202.0	189.5	297.4	284.7	179.9	167.0
89	279.4	265.9	208.9	195.5	302.8	289.2	184.7	171.2
90	286.8	272.4	216.3	201.8	310.5	296.0	190.8	176.4

	ONSHORE, PRIME	OFFSHORE	INTERIOR	FT. YUKON	FAIRBANKS-ALASKA HIGHWAY
YEAR	2.25 bcf	2.25 bcf	2.25 bcf	2.25 bcf	2.25 bcf
1976	0.2	0.2	0.3	0.4	0.6
77	1.2	1.3	4.0	5.8	9.4
78	4.0	4.2	14.8	22.1	35.2
79	14.4	14.8	63.4	104.0	152.2
80	40.7	41.2	115.5	179.4	249.7
81	30.6	31.1	52.0	66.2	91.0
82	28.9	43.9	38.4	44.5	58.9
83	30.1	35.2	36.9	40.8	52.5
84	30.9	33.2	37.1	40.4	51.4
85	31.9	33.4	38.1	41.3	52.3
86	32.9	34.2	39.2	42.4	47.2
87	34.3	35.5	40.8	44.1	48.7
88	35.9	37.2	42.7	46.2	50.9
89	37.7	39.0	44.8	48.4	53.5
90	39.9	41.2	47.3	51.1	56.5

still far greater than for any of the Trans-Canada routes.[1] Nor does changing the level of production alter the relationship among the LNG routes. In descending order of impact, they remain: Cook Inlet, Point Gravina, Fairbanks-Haines, and Golovin.

Another way to measure the importance of lower production on the LNG routes is to look at the difference in the level of employment. Table 90 demonstrates again that while about 1,800 fewer people are employed in the state at the lower level of production in 1990, this is still 4,900 to 6,800 people more than the largest Trans-Canada impact. The relationship among the LNG routes is also unchanged. In order of declining impact, the routes are still ordered: Fairbanks-Haines, Cook Inlet, Point Gravina, and Golovin.

Other comparisons could be made between the high production and low production cases. The computer runs were actually made but in the interest of conserving space, the results will not be reported here. Neither the relationship between the group of Trans-Canada and the group of LNG options, nor the relationship among the LNG options, was changed.

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[1] It may be noticed that the high production case generates lower gross products than the low production case, initially. This is because of the different staging of the Arctic Gas and El Paso proposals, and is not true after 1983.

Table 90

COMPARISON OF LNG OPTIONS AT DIFFERENT
LEVELS OF PRODUCTION WITH THE TRANS-CANADA OPTIONS
EMPLOYMENT IMPACTS
(Thousands of Wage Earners)

Route and Level of Production

	PT. GRAVINA		FAIRBANKS-HAINES		COOK INLET		GOLOVIN	
YEAR	3.5 bcf	2.25 bcf	3.5 bcf	2.25 bcf	3.5 bcf	2.25 bcf	3.5 bcf	2.25 bcf
1976	*	*	*	*	*	*	*	*
77	0.1	0.1	0.1	0.6	0.1	0.1	0.1	0.1
78	3.5	3.5	3.7	3.7	3.6	3.6	3.5	3.5
79	14.0	14.1	14.3	14.3	14.5	14.5	14.8	14.8
80	23.8	24.2	24.3	24.7	24.5	24.9	25.7	26.1
81	21.1	21.4	13.4	13.7	21.8	22.1	23.2	23.5
82	15.9	16.0	9.6	9.7	16.2	16.3	17.2	17.3
83	11.0	10.8	9.1	8.9	11.3	11.0	11.5	11.3
84	9.9	9.2	9.6	8.9	10.2	9.4	9.8	9.1
85	9.7	8.8	9.9	9.0	10.0	9.1	9.5	8.6
86	10.4	9.0	10.7	9.4	10.6	9.2	10.1	8.7
87	10.8	9.2	11.2	9.6	11.1	9.5	10.4	8.9
88	11.2	9.6	11.6	10.0	11.5	9.9	10.8	9.2
89	11.8	10.1	12.2	10.5	12.1	10.4	11.4	9.7
90	12.5	10.7	12.9	11.1	12.9	11.1	12.1	10.2

YEAR	ONSHORE, PRIME 2.25 bcf	OFFSHORE 2.25 bcf	INTERIOR 2.25 bcf	FT. YUKON 2.25 bcf	FAIRBANKS-ALASKA HIGHWAY 2.25 bcf
1976	*	*	0.1	0.1	0.1
77	0.1	0.2	0.4	0.6	1.0
78	0.4	0.5	1.6	2.3	3.7
79	1.5	1.6	6.1	9.4	14.6
80	4.3	4.4	11.3	16.5	23.9
81	3.5	3.7	6.5	8.4	11.3
82	3.3	5.5	4.5	5.2	6.6
83	3.5	4.2	4.2	4.6	5.6
84	3.5	3.9	4.2	4.5	5.4
85	3.6	3.8	4.2	4.5	5.4
86	3.7	3.9	4.3	4.6	5.4
87	3.8	4.0	4.4	4.7	5.5
88	3.9	4.1	4.6	4.9	5.7
89	4.1	4.3	4.8	5.1	5.9
90	4.3	4.5	5.0	5.4	6.2

* = Less than 50 persons

B. SENSITIVITY OF THE RESULTS TO THE PRICE OF GAS

The assumption of a wellhead price of gas at 50 cents per thousand cubic feet (mcf), while perhaps the most likely and realistic one which could be made at this time, is still arbitrary and could be affected either by administrative action of the Federal Power Commission or by action of the Congress to change or remove regulations on the wellhead price. One possible alternative is that the wellhead price of gas produced in Alaska which must compete with regulated-priced supplies in the Lower 48 will not differ significantly from zero.[1] Without worrying about the plausibility of such a result for the moment, one can usefully ask: what will be the effect of reducing the wellhead price to zero?

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[1] This assumption was propounded in a task force report for the Governor of Alaska. As quoted in ISEGR, Impact on the Alaska Economy of Alternative Gas Pipelines, April, 1975, pp. 49-50, the task force says:

> The task force has some concerns about the ability of either project to deliver gas competitively without government subsidy and with the result of a positive wellhead value. If the wellhead value is zero or very small, our royalties from the gas will be very slight and our severance taxes, which are based on wellhead value, will also be minimized. We find this to be a significant feature in our analysis since it has led us to conclude that if we are to derive any significant economic benefit from the developed Alaskan resource, it may well have to be through direct use of the gas ourselves...Accordingly, it is clearly in the State's best interest in obtaining a maximum return from its North Slope gas to keep that gas in the state for use here, and since we can only do that with a Trans-Alaskan line, it is in the State's interest to support such a route.

Table 91 compares Alaska's gross state product at a gas price of 50 cents and a gas price of zero for each of the proposed routes. Even though assumed production is higher in the LNG cases, the percentages change in impact caused by a zero gas price is much larger in the Trans-Canada cases. This is, of course, because direct employment is so small on the Trans-Canada routes in Alaska, relative to that on the LNG routes, and because of the larger stock of taxable capital equipment installed on the LNG routes. If the price of gas were reduced to zero, the impact on the Alaskan economy in the late 1980's would be reduced by about 50 percent on the Trans-Canada routes, and by 14-22 percent on the LNG routes. The absolute impact is about $28 million in the Trans-Canada cases and about $43 million in the LNG cases for the late 1980's. There is little or no impact of changing the gas price until the peak and final year of construction, when $12-$14 million is trimmed from the total impact. Since in percentage terms, this is but 3-5 percent, this change in assumptions has very little impact on the construction boom, although it does mitigate the following bust. Finally, it should be noted that in no case was rank order of the routes changed with respect to their impact on gross state product. The relationship of the routes to each other held up under this sensitivity test.

Table 91

COMPARISON OF THE EFFECT OF CHANGES
IN THE PRICE OF GAS ON PIPELINE IMPACTS
GROSS PRODUCT
(Millions of 1958 Dollars)

Route and Wellhead Price of Gas

	ONSHORE, PRIME		OFFSHORE		INTERIOR		FT. YUKON		FAIRBANKS-ALASKA HIGHWAY	
YEAR	$ .50	$ 0	$ .50	$ 0	$ .50	$ 0	$ .50	$ 0	$ .50	$ 0
1976	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.6	0.6
77	1.2	1.2	1.3	1.3	4.0	4.0	5.8	5.8	9.4	9.4
78	4.0	4.0	4.2	4.2	14.8	14.8	22.1	22.1	35.2	35.2
79	14.4	14.4	14.8	14.8	63.4	63.4	104.0	104.0	152.2	152.2
80	40.7	27.6	41.2	28.1	115.5	102.2	179.4	166.0	249.7	236.2
81	30.6	14.0	31.1	14.6	52.0	35.4	66.2	49.5	91.0	74.1
82	28.9	10.9	43.9	11.5	38.4	20.4	44.5	26.5	58.9	40.8
83	30.1	10.1	35.2	10.7	36.9	16.9	40.8	20.8	52.5	32.4
84	30.9	10.0	33.2	10.6	37.1	16.2	40.4	19.5	51.4	30.4
85	31.9	10.2	33.4	10.8	38.1	16.3	41.3	19.5	52.3	30.5
86	32.9	10.4	34.2	11.0	39.2	16.6	42.4	19.8	47.2	24.5
87	34.3	10.7	35.5	11.4	40.8	17.2	44.1	20.5	48.7	25.1
88	35.9	11.1	37.2	11.8	42.7	17.8	46.2	21.3	50.9	26.0
89	37.7	11.5	39.0	12.2	44.8	18.5	48.4	22.1	53.5	27.1
90	39.9	11.9	41.2	12.7	47.3	19.2	51.1	23.0	56.5	28.4

	PT. GRAVINA		FAIRBANKS-HAINES		COOK INLET		GOLOVIN	
YEAR	$ .50	$ 0	$ .50	$ 0	$ .50	$ 0	$ .50	$ 0
1976	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.2
77	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
78	32.4	32.4	34.8	34.8	31.0	31.0	36.1	36.1
79	122.3	122.3	126.2	126.2	123.0	122.9	198.8	198.8
80	396.9	385.9	292.0	281.1	421.7	421.7	447.2	435.5
81	362.9	348.1	188.5	173.9	388.7	377.2	352.6	337.3
82	316.7	299.3	165.6	148.4	338.6	322.4	246.3	228.7
83	269.3	247.5	168.8	147.1	292.6	271.3	181.4	159.6
84	259.7	233.2	175.2	148.7	282.6	256.5	168.5	142.0
85	260.1	231.4	181.6	152.9	283.1	254.7	166.2	137.5
86	265.9	233.0	189.9	157.1	289.0	256.4	169.5	135.7
87	269.5	234.1	195.6	160.2	292.6	257.5	174.1	138.3
88	274.2	236.4	202.0	164.3	297.4	260.0	179.9	142.1
89	279.4	239.2	208.9	168.8	302.8	262.9	184.7	144.5
90	286.8	243.8	216.3	173.3	310.5	267.9	190.8	147.9

The changes in impacts on employment are shown in Table 92. As in the case of gross state product, there is virtually no impact from changing the price assumption until 1980, the peak construction year. While the absolute employment reduction is about 2,000 persons larger on the LNG routes in the long run, in percentage terms the impact of the changed assumption is far larger on the Trans-Canada options. The LNG options' employment is reduced from 42 to 45 percent if the state is deprived of production revenues by a zero wellhead price, while the corresponding Trans-Canada employment is reduced by anywhere from 58 to 81 percent, the largest reductions occurring where employment is the smallest. It can thus be said that the six Trans-Canada routes' employment impacts are more sensitive to the price of gas than are those of the LNG routes. However, the relative rank order of the ten possible routes was unchanged by the changed price assumption.

Table 92

COMPARISON OF THE EFFECT OF CHANGES
IN THE PRICE OF GAS ON PIPELINE IMPACTS
EMPLOYMENT
(Thousands of Wage Earners)

Route and Wellhead Price of Gas

	ONSHORE, PRIME		OFFSHORE		INTERIOR		FT. YUKON		FAIRBANKS-ALASKA HIGHWAY	
YEAR	$ .50	$ 0	$ .50	$ 0	$ .50	$ 0	$ .50	$ 0	$ .50	$ 0
1976	*	*	*	*	0.1	0.1	0.1	0.1	0.1	0.1
77	0.1	0.1	0.2	0.2	0.4	0.4	0.6	0.6	1.0	1.0
78	0.4	0.5	0.5	0.5	1.6	1.6	2.3	2.3	3.7	3.7
79	1.5	1.5	1.6	1.6	6.1	6.1	9.4	9.4	14.6	14.6
80	4.3	2.3	4.4	2.4	11.3	9.3	16.5	14.6	23.9	21.9
81	3.6	1.1	3.7	1.3	6.5	4.0	8.4	5.9	11.3	8.8
82	3.3	0.7	5.5	0.8	4.5	1.9	5.2	2.6	6.6	4.0
83	3.5	0.6	4.2	0.7	4.2	1.4	4.6	1.8	5.6	2.8
84	3.5	0.6	3.9	0.7	4.2	1.2	4.5	1.6	5.4	2.5
85	3.6	0.6	3.8	0.7	4.2	1.2	4.5	1.5	5.4	2.4
86	3.7	0.6	3.9	0.7	4.3	1.2	4.6	1.5	5.4	2.3
87	3.8	0.7	4.0	0.7	4.4	1.3	4.7	1.6	5.5	2.4
88	3.9	0.7	4.1	0.8	4.6	1.3	4.9	1.6	5.7	2.4
89	4.1	0.7	4.3	0.8	4.8	1.4	5.1	1.7	5.9	2.5
90	4.3	0.8	4.5	0.9	5.0	1.5	5.4	1.8	6.2	2.6

	PT. GRAVINA		FAIRBANKS-HAINES		COOK INLET		GOLOVIN	
YEAR	$ .50	$ 0	$ .50	$ 0	$ .50	$ 0	$ .50	$ 0
1976	*	*	*	*	*	*	*	*
77	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
78	3.5	3.5	3.7	3.7	3.6	3.6	3.5	3.5
79	14.0	14.1	14.3	14.3	14.5	14.5	14.8	14.8
80	23.8	22.2	24.3	22.7	24.5	24.4	25.7	24.1
81	21.1	19.0	13.4	11.3	21.8	20.1	23.2	21.0
82	15.9	13.4	9.6	7.1	16.2	13.8	17.2	14.7
83	11.0	7.9	9.1	6.1	11.3	8.3	11.5	8.4
84	9.9	6.2	9.6	5.9	10.2	6.5	9.8	6.1
85	9.7	5.8	9.9	6.0	10.0	6.1	9.5	5.6
86	10.4	5.9	10.7	6.3	10.6	6.2	10.1	5.5
87	10.8	6.1	11.2	6.5	11.1	6.4	10.4	5.7
88	11.2	6.3	11.6	6.7	11.5	6.7	10.8	5.9
89	11.8	6.6	12.2	7.1	12.1	7.0	11.4	6.2
90	12.5	7.1	12.9	7.5	12.9	7.5	12.1	6.6

* = Less than 50 persons