Draft

A PRELIMINARY OVERVIEW OF THE ECONOMIC AND SOCIAL EFFECTS OF THE PROPOSED NORTHWEST GAS PIPELINE ON ALASKA

O. Scott Goldsmith
John A. Kruse
Charles L. Logsdon
Michael J. Scott

University of Alaska
Institute of Social, Economic, and Government Research
Anchorage, Fairbanks, and Juneau

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2.3.1 Alaskan Overview: The State

Population

Alaska is at once the largest state in land area and the smallest in population. 1975 estimates by the Alaska Department of Labor put the state population at around 404,000, of which roughly one-half (177,817) live in the Anchorage area or within commuting distance of that community. Alaska's second largest city, Fairbanks, had an estimated population of 55,517 in 1975. The coastal communities of Southeast Alaska constitute the other major region of population concentration in the state, including Juneau--17,714 and Ketchikan--11,311.

Recent growth in population has been extremely rapid due to the enormous manpower and capital requirements of Alyeska's trans-Alaska oil pipeline (TAPS) construction project. This project has at peak levels of activity directly employed over 22,000 people on the line, plus additional support staff. Economic activity spawned by the construction project has created new business opportunities in virtually every sector, as the tremendous capital inflow has filtered through the economy, attracting more immigrants. The growth rate has been all the more spectacular, given Alaska's initially small population base.

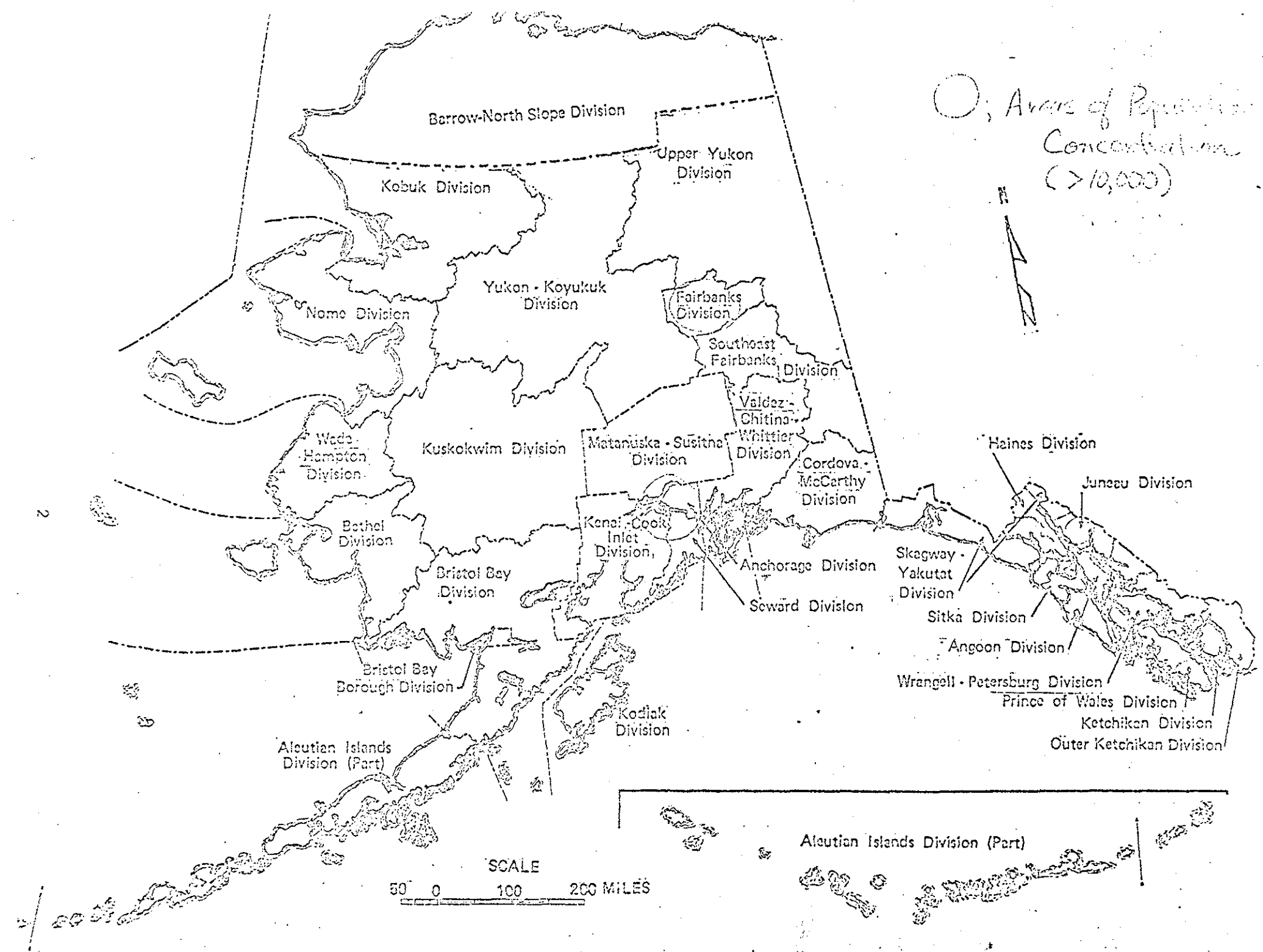
Economic Trends

The history of the Alaskan economy is one of boom and bust resource extractive activity. Initially, the attraction of fur-bearing animals drew traders of Russian, British, and American origin. It was not until the discovery of gold in the Juneau area and the subsequent discoveries in the Klondike and Nome areas during the later 1800's and early 1900's that any substantial numbers of white men came to Alaska. By this time, the salmon fisheries had also begun to develop.

The mining activity--not only gold, but the extraordinarily rich copper deposits in the Kennicott area--generated the initial development thrust in Alaska, as the Alaska railroad was constructed to connect the interior of Alaska at Fairbanks with Seward on the coast and a military trail built from Valdez to Eagle.

By the 1920's, mining activity had slowed and Alaska entered a stagnant economic phase. Although the fisheries enjoyed immense prosperity, virtually all employment was seasonal and highly transient.

World War II brought renewed national interest in Alaska as its strategic location became evident. A massive influx of military personnel followed (over 100,000) and continued into the early 1950's, when virtually all currently existing roads in the state were constructed. (The Alaska Highway connecting Alaska with the southern states was constructed during the war.) The 1950's was the decade of the military



O; Areas of Population Concentration (>10,000)

in Alaska, and its presence continues to be a considerable force in the Alaskan economy.

Discovery of oil on the Kenai Peninsula in the late 1950's ushered in a new phase in the economy, as exploration and development activities in the oil and gas sector provided another "big boom" impetus to Alaskan economic growth.

Alaska Economic Growth 1961-1972

Several indicators exist which can be used to measure economic activity. Gross state product and employment are convenient measures which are readily available and illustrate quite clearly the dynamics of the Alaskan economy.

As shown in Table 2.3.1.1, all industries in the state grew between 1961 and 1972. The mining sector, which includes oil and gas, was the most rapidly expanding sector, due to development of the Kenai fields and the exploration on the North Slope.

Oil development was a major driving force underlying the growth of the economy, especially in the support sectors like transportation, communications, public utilities, trade, finance, and services, which thrived on the incomes generated by the oil activity.

State and local government was also a rapidly expanding sector, as Alaska began to assume the responsibilities which came with statehood, not the least of which was the management of funds accruing from the enlarged tax base provided by oil production and development, including the $900 million bonus lease sale at Prudhoe Bay in 1969. The enlargement of local government and land selections falling out of the Statehood Act were other early responsibilities.

Contract construction received a major push during and after the earthquake in 1964 (due partly to reconstruction) and grew as a direct result of both government and mining sector growth. Construction of roads, residential construction, and commercial construction were all represented.

There was slow and relatively insignificant growth in the renewable resource industries--agriculture, forestry, and fisheries--as fluctuating world market conditions and productivity problems tended to prevent large gains in this sector.

Employment growth shows a slightly different picture, mainly due to the capital intensity of oil and gas production. The major source of employment growth was the support sector. State and local government was the other leading sector in employment growth, as more people became employed in the young state's burgeoning public sector.

Table 2.3.1.1
GROSS PRODUCT IN SELECTED INDUSTRIAL SECTORS
Average Annual Growth Rate 1961-1972
(Percent)

	Current Price Gross Product	Real Gross Product
All Industries	9.8	5.7
All Industries except mining	9.3	4.2
Commodity Producing Industries	10.5	7.8
Mining	17.8	17.6
Commodity Producing Industries Except Mining	8.3	2.4
Contract Construction	11.5	5.6
Fisheries and Forest Products	4.5	0.4
Other Manufacturing	11.2	7.3
Support Sector	10.0	7.4
Transportation, Communications, and Public Utilities	7.4	6.3
Trade, Finance, and Services	11.3	8.2
Government	9.1	1.4
Federal	6.4	0.5
State and Local	16.6	9.7

Source: David T. Kresge, "Alaska Economic Growth, 1961-1972", Alaska Review of Business and Economic Conditions 11(2), Aug. 1974.

The fisheries and forest products sector showed a greater increase in employment than in real output, which would indicate that the output per worker declined and the income generated was spread among a larger number of employees. (Table 2.3.1.2)

Table 2.3.1.3 lists Alaska personal income by major sources by industry and illustrates dramatically that most personal income in Alaska came from wages and salaries, with the government sector the largest contributor, followed by the support sectors and contract construction. Such a finding is not surprising in a sparsely populated capital-deficient region relying on seasonal resource extraction and government as its economic base.

A more recent comparison of economic growth between 1970 and 1974 shows initial stages of the impact on the economy of the construction of the trans-Alaska oil pipeline. (Table 2.3.1.4) Growth came primarily in construction and the support industries while government, a previously leading growth sector, grew more slowly than before.

Alaska per capita income has historically been the highest in the nation. In 1974, it was $5,947 compared to a U.S. average of $4,640. (Table 2.3.1.5) Offsetting this is the fact that it costs more to live in Alaska. Although there is no one statistic upon which to rely, the cost of living generally runs 20 to 50 percent higher in Alaska than for the United States as a whole.

In order to account for both cost of living differences and the change in relative price levels in Alaska with respect to the rest of the United States, the University of Alaska's Institute of Social, Economic and Government Research (ISEGR) has created a hybrid index based upon the Anchorage consumer price index, urban family budget and United States Department of Agriculture food price surveys. This price index, known as RPI, though subject to some rather severe limitations, illustrates changes in the cost of living differential in Alaska vs. the U.S.A. caused by price movements. (Table 2.3.1.6)

The declining difference between Alaska's RPI and the U.S. CPI shows that changing price levels through 1974 have somewhat mitigated the cost of living differential between Alaska and the rest of the United States, although that difference is still substantial. The surge of economic activity associated with the construction of the Alyeska TAPS pipeline has caused recent price increases in Alaska to exceed those in the contiguous United States, but this may or may not be an aberration in the longer trend.

Government Sector

Historically, the government sector has been very important to the Alaskan economy and will continue to be in the future, but in

Table 2.3.1.2

EMPLOYMENT BY INDUSTRY GROUP
Annual Average Employment

	1961	1964	1967	1970	1972
Total Employment	100.2	109.0	121.7	136.4	144.0
Nonwage and Salary Employment	10.9	11.3[a]	11.2[a]	12.5[a]	13.4[a]
Total Wage and Salary Employment	89.3[a]	97.8	110.5	123.9	130.6
	Wage and Salary Employment				
All Industries	89.3[a]	97.8	110.5	123.9	130.6
COMMODITY PRODUCING INDUSTRIES	10.6	12.6	14.8	17.9	18.9
Mining	1.2	1.1	2.0	3.0	2.1
Commodity Producing Industries Except Mining	9.4	11.5	12.8	14.9	16.8
Contract Construction	4.1	5.8	6.0	6.9	7.9
Fisheries and Forest Products	4.5	4.8	5.8	6.7	7.4
Other Manufacturing	.8[a]	.9	1.0	1.3	1.5
SUPPORT SECTOR	21.9	24.6	30.3	39.0	44.8
Transportation, Communications, and Public Utilities	7.1	6.9	7.5	9.1	10.0
Trade, Finance, and Services	14.8	17.7	22.8	29.9	34.8
GOVERNMENT	56.3	60.5	65.5	66.9	66.9
Federal	48.1	49.7	51.1	48.5	43.6
State and Local	8.2[a]	10.8	14.4	18.4	23.3

[a]Taken from Alaska Department of Economic Development, Division of Economic Enterprise, Statistical Review, December, 1972.
[b]Taken from National Bank of Alaska, A Performance Report of the Alaskan Economy, 1973

Source (except as otherwise indicated): Alaska Department of Labor, Statistical Quarterly various issues. Reprinted from Kresge, "Alaska Economic Growth".

Table 2.3.1.3

ALASKA PERSONAL INCOME BY MAJOR SOURCES
1961-1972
(Millions of Dollars)

	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972
Personal Income	651.3	679.1	710.3	797.4	864.1	934.3	1042.2	1126.3	1265.9	1442.7	1573.2	1728.1
Wage and Salary Disbursements	538.3	557.1	589.3	670.4	722.1	777.3	867.2	947.3	1080.9	1217.7	1315.2	1447.1
Mining	11.5	12.5	12.5	12.5	13.1	17.5	28.4	38.0	56.3	52.0	43.7	39.1
Metal Mining	2.8	2.6	2.1	1.4	1.8	2.0	1.6	1.5	1.6	2.7	2.1	1.5
Oil and Gas	6.2	7.3	8.1	8.5	8.3	12.5	24.2	34.3	52.7	47.1	38.9	34.6
Other	2.4	2.6	2.4	2.6	3.0	3.0	2.6	2.3	2.1	2.1	2.8	3.0
Contract Construction	47.1	47.6	51.1	77.8	88.0	88.8	95.2	100.1	117.9	125.8	143.0	153.4
Manufacturing	40.1	41.6	44.0	46.0	54.7	56.2	56.4	63.3	69.3	83.9	86.5	89.8
Food and Kindred Products	20.1	18.6	18.5	18.2	24.0	24.2	20.1	23.2	23.7	31.3	31.1	30.0
Lumber, Wood, Paper & Allied Prod.	14.1	16.2	16.4	19.8	21.8	23.2	27.6	29.2	31.6	36.7	37.8	40.9
Other	5.8	6.8	7.1	8.0	8.9	8.8	8.7	10.8	13.9	15.9	17.6	18.9
Transportation	30.9	32.2	33.5	35.3	37.8	39.2	46.2	49.2	65.1	70.9	67.2	74.2
Trucking and Warehousing	6.1	6.6	7.0	8.4	10.1	8.0	11.0	11.7	17.1	19.2	17.5	18.7
Water Transportation	7.1	7.9	7.8	7.5	6.9	9.0	9.3	8.4	8.2	8.5	8.1	9.9
Air Transportation	14.9	14.9	15.8	16.8	17.8	18.9	22.1	24.7	35.0	37.4	34.9	39.2
Other Transportation	2.8	2.8	2.8	2.7	3.0	3.2	3.9	4.3	4.9	5.8	6.6	6.4
Communications and Public Utilities	31.4	29.4	29.0	29.2	30.9	33.4	32.7	34.9	37.1	40.6	52.8	57.2
Trade	54.2	53.5	56.7	61.3	71.4	79.1	89.6	99.0	116.6	132.0	142.2	157.5
Wholesale Trade	16.6	14.8	15.3	17.3	19.5	22.9	26.0	28.4	35.6	40.8	41.8	46.0
Retail Trade	37.6	38.7	41.5	44.0	52.0	56.2	63.6	70.6	81.0	91.2	100.4	111.5
Finance, Insurance, and Real Estate	9.3	10.5	12.0	13.6	15.8	17.3	17.5	19.7	22.4	27.6	31.1	37.7
Services	33.5	36.5	36.4	40.7	45.7	49.2	57.0	66.3	77.8	88.9	99.4	117.8
Hotels, Motels, and Lodges	NA	NA	3.6	4.1	5.3	6.1	6.8	6.8	7.8	8.5	9.7	11.0

Table 2.3.1.3

ALASKA PERSONAL INCOME BY MAJOR SOURCES
1961-1972
(Millions of Dollars)

	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	197
Personal Services	NA	NA	3.3	3.4	3.7	3.9	4.1	4.7	4.9	5.3	5.7	5
Business Services	NA	NA	8.0	10.0	11.1	11.6	14.1	18.9	22.1	18.8	18.2	17
Medical Services	NA	NA	5.8	6.6	6.9	7.8	8.5	9.3	11.9	15.8	20.4	28
Other Services	NA	NA	15.7	16.5	18.7	19.8	23.4	26.6	31.1	40.4	45.3	55
Government	279.6	292.5	331.3	353.0	363.5	395.0	442.9	475.0	516.3	593.6	646.6	708
Federal Government	228.5	231.9	241.2	274.9	271.6	291.1	324.6	339.1	359.7	404.7	416.6	438
State and Local Government	51.1	60.6	72.2	78.2	91.9	103.9	118.3	135.9	156.6	188.9	230.0	270
Other Industries (Agriculture Forestry, and Fisheries)	0.8	1.0	0.8	0.9	1.1	1.5	1.2	1.9	2.0	2.5	2.8	11
Other Labor Income	15.0	16.0	18.0	20.0	23.0	26.0	29.0	33.0	33.0	38.0	44.0	40
Proprietors' Income	47.0	51.0	53.0	50.0	56.0	66.0	71.0	67.0	68.0	74.0	86.0	90
Property Income	39.0	44.0	38.0	47.0	52.0	53.0	61.0	62.0	70.0	82.0	89.0	95
Transfer Payments	28.0	28.0	30.0	32.0	34.0	38.0	42.0	52.0	58.0	79.0	100.0	114
Less Personal Contribution to Social Ins.	16.0	17.0	18.0	22.0	23.0	26.0	28.0	35.0	44.0	48.0	61.0	67

Sources: Alaska Department of Labor, Statistical Quarterly, various issues; U.S. Department of Commerce, Survey of Current Business, various issues, as reported by Kresge, "Alaska Economic Growth"

Table 2.3.1.4
COMPARISON OF THE ECONOMY OF ALASKA, 1970 and 1974

	TOTAL PAYROLL[1]		AVERAGE YEARLY[2] EMPLOYMENT	
	1970	1974	1970	1974
Ag, Fish, Forest	2,489,507	18,415,474	193	1,031
Mining	52,002,943	67,365,820	2,995	2,976
Construction	125,775,092	385,403,484	6,894	14,066
Manufacturing	83,927,202	130,838,528	7,839	9,611
Food	31,314,331	42,184,229	3,741	4,292
Lumber	22,642,507	40,887,902	1,743	2,395
Paper	14,068,618	22,380,440	1,016	1,244
Other	15,901,746	25,385,957	1,339	1,680
Transportation	70,892,498	130,425,740	6,428	8,534
Air	37,408,974	62,497,693	3,071	3,977
Other	33,483,524	67,928,047	3,356	4,557
Communications	29,665,699	53,042,840	1,857	2,808
Public Utilities	10,883,728	20,016,601	819	1,039
Trade	132,011,981	220,738,153	15,365	21,135
Finance	27,604,099	56,148,018	3,098	4,895
Services	88,927,726	193,399,663	11,435	18,313
Government	593,559,162	830,217,409	66,978	72,376
Federal	404,667,366	491,955,940	48,537	46,616
State & Local	188,891,796	338,261,469	18,441	25,760
Total	1,217,739,637	2,106,011730	123,901	156,784

Table 2.3.1.4
COMPARISON OF THE ECONOMY OF ALASKA, 1970 and 1974
(Cont'd)

	NUMBER OF[3] ESTABLISHMENTS		GROSS STATE PRODUCT[4] (MILLION 1958 DOLLARS)	
	1970	1974	1970	1974
Ag, Fish, Forest			35.9	23.6
Mining	214	182	403.9	425.9*
Construction	1062	1478	54.4	107.6
Manufacturing	350	426	98.9	118.8
Food	145	175	46.5	46.0
Lumber	85	91	16.0	23.1
Paper	4	4	23.3	32.2
Other	116	156	13.1	17.4
Transportation	510	564	89.3	167.0*
Air	187	199	55.8	89.7*
Other	323	365	33.5	77.3*
Communications	53	126	63.8	113.7
Public Utilities	35	38	31.8	55.0
Trade	1946	2281	137.4	197.8
Finance	402	581	85.0	137.7
Services	1798	2253	67.3	108.1
Government			303.2	320.0
Federal			234.5	224.8
State & Local			68.7	95.2
Total	7230	8919	1370.9	1775.2

Table 2.3.1.4
COMPARISON OF THE ECONOMY OF ALASKA, 1970 and 1974
(Cont'd)

	1970-1974 RATE OF GROWTH EMPLOYMENT (%)	1970-1974 AVG. RATE OF GROWTH GROSS STATE PRODUCT (%)
Ag, Fish, Forest	NA	
Mining	-0.1	1.1
Construction	7.8	19.6
Manufacturing	4.5	4.0
Food	2.9	-0.2
Lumber	7.5	8.9
Paper	4.5	7.6
Other	5.1	6.6
Transportation	6.6	17.4
Air	5.9	12.2
Other	7.2	26.1
Communications	10.2	15.6
Public Utilities	5.4	14.6
Trade	7.5	8.8
Finance	11.6	12.4
Services	12.0	12.1
Government	1.6	1.1
Federal	-0.8	-0.8
State & Local	7.9	7.7
Total	5.3%	5.9%

Source: 1. Alaska Department of Labor, Statistical Quarterly, various issues.
2. Ibid.
3. Ibid.
4. ISEGR

* 1973 deflators used

Table 2.3.1.5
U. S. and Alaska Personal Income
and
Per Capita Income, 1970-74

PERSONAL INCOME

	1970	1971	1972	1973	1974
U.S.	3,966	21,195	4,537	5,023	5,448
Alaska	4,644	4,916	5,192	5,930	7,062

PER CAPITA PERSONAL INCOME

U.S.	3,397	3,627	3,856	4,305	4,640
Alaska	3,882	4,129	4,281	4,967	5,947

Source: U.S. Department of Commerce, Bureau of Economic Analysis, Survey of Current Business, various issues.

Table 2.3.1.6

ALASKAN RELATIVE PRICE INDEX COMPARED TO CONSUMER PRICE INDEX

	Alaska RPI	% Difference	U.S. CPI
1967	142.5	42.5	100.0
1968	150.6	44.5	104.2
1969	156.2	42.3	109.8
1970	164.3	41.3	116.3
1971	168.4	38.8	121.3
1972	169.9	35.6	125.3
1973	175.6	31.9	133.1
1974	193.7	31.1	147.7

Source: Kresge, "Alaska Economic Growth"

a different form. In 1961, average annual wage and salary employment in the state was 89.3 thousand, of which 48.1 thousand were Federal government employees, military and civilian. An additional 8.2 thousand were state and local government employees, so that 63 percent of wage and salary earners were within the government sector. By 1973, the composition of the government sector had changed considerably and its relative importance in terms of direct employment declined. Of a wage and salary labor force of 137.3 thousand, 44.6 thousand were Federal employees and 24.3 thousand state and local for a total of 68.9 thousand, or 50 percent of wage and salary earners. Federal government employment declined slightly, due to a reduction in military employment to 27.5 thousand by 1973. Over the same period, civilian Federal employment remained fairly constant at approximately 17 thousand.

State and local government employment grew at a 9.5 percent annual rate between 1961 and 1973 to account for the absolute increase in government sector employment. This growth reflects the increase in demand for services associated with the coming of statehood in 1959 and the growth in population during this period.

The fiscal capacity of the economy also has been transformed over this historic period. In 1961, state government revenues of $46 million came primarily from income taxes, selective sales and gross receipts taxes, and miscellaneous revenues. Federal government transfers were 12 percent of revenues. By the 1970's, revenues from petroleum-related activities began to contribute the largest share to state funds and Federal government transfers had increased to approximately 30 percent of state revenues. The most important single event accounting for this shift was the bonus lease sale of state lands at Prudhoe Bay in 1969. The revenue from this sale allowed substantial expansion of state government operations during the early 1970's but will have dissipated before production taxes and royalties on Prudhoe Bay oil begin providing the state with an income source commensurate with the lease bonus revenues. Over the period since statehood state government revenues have grown at the annual rate of approximately 20%.

Local goverment fiscal capacity has not expanded to the same extent as the state because much of the oil and gas development-related activity is in rural areas of the state and thus not subject to municipal property taxes. Between 1962 and 1972 total local revenues increased from $41 million to $195 million for an annual growth rate of 17%. Local revenues from traditional sources such as the property tax and the sales tax have increased with the formation and growth of communities, but transfers from the state government have been the most important local revenue source and have grown faster than any other. In the early 1970's, they have accounted for nearly 50 percent of local revenues.

The pattern of government expenditures since statehood has changed most markedly at the Federal level, as direct expenditures in Alaska

grew at a moderate 6 percent annually. Intergovernmental transfers, primarily to the state, grew at a 35 percent annual rate. Direct Federal government expenditures in the state remain an important economic component, but their relative position is declining. State government expenditures have been growing at an annual rate of 18 percent, with expenditures for education and transportation consistently accounting for 60 percent of the total. Local government expenditures have also been growing at approximately 18 percent annually, with education alone accounting for approximately 50 percent of the total.

2.3.2 Alaska Overview: Potential Impact Areas

Population

Baseline data for those regions which would be directly affected by the gas line along the Alcan route follows. Unfortunately, the latest reliable data available on a native-non-native basis is from the 1970 Census. Undoubtedly, the current pipeline activity in these regions has brought many non-native temporary residents into the areas. For analysis purposes, the Census Divisions listed in Table 2.3.2.1 will be aggregated into economic regions for the impact simulation using the ISEGR econometric model (MAP model) section.

Table 2.3.2.1
Alaska 1975 Estimated Population,
Selected Census Divisions

Census Division	1975 Population	MAP Region
Anchorage	177,817	Anchorage
Fairbanks	55,517	Fairbanks
S. E. Fairbanks	5,894	Fairbanks
North Slope	6,454	Northwest
Upper Yukon	8,780	Interior
Yukon-Koyukuk	8,423	Interior

Source: Alaska Department of Labor, Research and Analysis Section, Current Population Estimates by Census Division, July 1, 1975.

In order to construct the TAPS pipeline, numerous construction camps have been established along the pipeline corridor. Camps and pump stations along the corridor north of Delta Junction are as follows, going south from Prudhoe Bay.

1. Prudhoe - (Pump 1)
2. Franklin Bluffs
3. Pump 2
4. Happy Valley
5. Pump 3
6. Atigun
7. Galbraith (Pump 4)
8. Chandalar
9. Dietrich
10. Coldfoot
11. Prospect (Pump 5)
12. Old Man
13. 5 Mile (Pump 6)
14. Livengood
15. Fort Wainwright
16. Delta Junction (Pump 8)*

* Pump 7 is presently only a proposed site with development dependent upon future capacity requirements of the line. Since personnel shifts occur frequently, no attempt has been made to estimate camp populations although, in general, roughly 5,000-8,000 people are accomodated.

Table 2.3.2.2

DISTRIBUTION OF POPULATION
IN COMMUNITIES WITH MAJOR POTENTIAL
FOR GAS PIPELINE IMPACT

	1970 Population		
WITHIN 5 MILES OF ROUTE	Native	Non-Native	Total
Prudhoe Bay	4	45	49
Deadhorse	15	148	163
Fairbanks	1,818	44,046	45,864
Delta Junction (incl. Big Delta)[1]	10	693	703
Dot Lake	29	13	42
Tanacross	77	7	84
Tetlin	108	6	114
Tok[2]	34	180	214
Northway	180	20	200
Subtotal	2,275	45,158	47,433
FROM 6 to 50 MILES			
Evansville	14	43	57
Stevens Village	72	2	74
Rampart	35	1	36
Minto	159	9	168
Subtotal	280	55	335
BEYOND 50 MILES			
Anaktuvik Pass	97	2	99
Allakakett	170	4	174
Barrow	1,904	200	2,104
Anchorage	5,286	121,047	127,333
Haines	108	355	463
Subtotal	7,565	121,608	130,173
TOTAL	10,120	166,821	177,941

Table 2.3.2.2-(Con't)

DISTRIBUTION OF POPULATION
IN COMMUNITIES WITH MAJOR POTENTIAL
FOR GAS PIPELINE IMPACT

[1]Estimated 1975 population, 892

[2]Estimated 1975 population, 450

Sources: "1970 Census of Population: Number of Inhabitants--Alaska," PC(1)-A3. Bureau of the Census.

"Indian Population, 1970 Census--Census County Divisions and Places: Alaska." Bureau of Indian Affairs, U.S. Department of Interior, March 1971 (Unpublished).

"Community Inventory--Alaska," Federal Field Committee for Development Planning in Alaska. Anchorage: June, 1971.

Future use of these camps by gas pipeline construction crews would result in population concentrations in the same geographic vicinities and would require similar economic services. In addition, the two planned construction camps between Delta Junction and the Canadian border would also require economic support services.

Economic Activity

In order to more closely examine current economic activity and to set the stage for the impact simulations in a following section, economic data for Fairbanks, Anchorage, and the North Slope have been compiled.

Table 2.3.2.3 illustrates the relative distribution of wages and salaries and employment for these three regions. As expected, mining (in this case oil and gas) accounts for over one-third of the payroll on the North Slope. On the other hand, the mining payroll is of far less direct importance to the economies of Anchorage and Fairbanks. Owing to the relatively high wages paid by the mining sector, the percentage of people hired in each region by mining is far less than the percentage of total wages and salaries paid. This holds true in all three of the regions.

Government is the most important employer in all three regions, especially in Fairbanks and the North Slope, where over half of the people employed work for a government. Not only is government the major employer, but it also has the largest payroll.

Pipeline construction in 1974 can be seen to impact Fairbanks more than the other two regions, by reference to the quarterly figures, which illustrates what happened to Anchorage, Barrow, and Fairbanks in 1974 when the construction of TAPS got under way. Barrow exhibits very little construction impact, with a major upswing in government employment (Table 2.3.2.4). Fairbanks shows a substantial growth in construction, from 2,000 employed in second quarter, to 5,700 in the fourth. In fact, this construction boom was enough to counteract the historic seasonal downturn in fourth-quarter employment in all sectors.

Anchorage, owing to its larger size, does not exhibit such a marked boom, although there is noticeable growth throughout the year. Interestingly, the construction boom effectively counteracted the seasonal downturn in economic activity in Anchorage, too.

Personal Incomes and Per Capita Incomes

The existing distribution of personal incomes is shown in Table 2.3.2.5 for the parts of Alaska which are expected to be most heavily impacted by gas pipeline development. The five-year history demonstrates

Table 2.3.2.3

DISTRIBUTION OF PAYROLL AND EMPLOYMENT
BY INDUSTRY FOR MAJOR IMPACT REGIONS
1974

INDUSTRY	FAIRBANKS		NORTH SLOPE		ANCHORAGE	
	Percent of* Payroll	Percent of Employment	Percent of Payroll	Percent of Employment	Percent of Payroll	Percent of Employment
Ag., Fish, Forest	0.06	0.01	0	0	0.1	0.2
Mining	1.5	1.4	38.3	20.0	8.9	1.8
Const.	29.1	15.9	14.9	8.2	16.4	10.0
Mfg.	1.4	1.6	0	0	2.4	2.3
Trans., Commun. Pub. Fac.	11.9	10.0	11.3	10.0	11.3	9.5
Trade	11.2	16.5	2.0	6.3	16.4	20.9
Finance, Insurance, Real Estate	2.1	3.2	3.5	4.7	4.6	5.4
Services	12.4	16.7	0.3	6.6	13.7	17.2
Government	30.3	34.6	29.8	44.2	26.2	32.7

Source: Alaska Department of Labor, Statistical Quarterly

*Totals my not equal 100% due to rounding

Table 2.3.2.4

AVERAGE EMPLOYMENT BY QUARTER*
IN ALASKA, 1974

STATE

	Q_1	Q_2	Q_3	Q_4
Ag., Fish, Forest	633	800	1,767	900
Mining	2,400	3,067	3,300	3,067
Construction	5,867	12,533	19,100	18,800
Manufacturing	7,000	10,033	12,600	8,767
Transportation, Communications Public Facilities	10,267	12,133	13,767	13,367
Trade	17,957	20,716	22,689	23,177
Finance, Insurance, Real Estate	1,533	4,833	5,100	5,200
Service	15,698	18,180	19,352	20,023
Government	41,633	43,867	45,200	44,400
TOTAL	102,988	126,162	142,875	137,701

FAIRBANKS

Ag., Fish, Forest	9	20	24	12
Mining	213	340	356	215
Construction	903	1,947	4,025	5,708
Manufacturing	240	280	340	369
Transportation, Communications Public Facilities	1,409	1,818	2,282	2,361
Trade	2,599	3,139	3,549	3,782
Finance, Insurance, Real Estate	577	610	657	720
Service	2,625	3,175	3,584	3,803
Government	6,728	6,957	6,765	6,878
TOTAL	15,283	18,286	21,582	23,849

Table 2.3.2.4 (con't)

AVERAGE EMPLOYMENT BY QUARTER*
IN ALASKA, 1974

BARROW-NORTH SLOPE

	Q_1	Q_2	Q_3	Q_4
Ag., Fish, Forest	0	0	0	0
Mining	197	344	370	250
Construction	52	165	124	134
Manufacturing	0	0	0	0
Transportation, Communications Public Facilities	147	169	127	138
Trade	64	93	118	89
Finance, Insurance, Real Estate	54	68	92	56
Service	148	135	89	12
Government	564	593	642	764
TOTAL	1,226	1,570	1,562	1,443

ANCHORAGE

Ag., Fish, Forest	69	135	112	81
Mining	921	1,077	1,040	1,105
Construction	3,248	5,445	7,758	7,075
Manufacturing	1,093	1,445	1,584	1,392
Transportation, Communications Public Facilities	4,650	5,508	6,158	6,017
Trade	10,779	12,060	12,823	13,528
Finance, Insurance, Real Estate	2,977	3,137	3,251	3,238
Service	9,002	10,092	10,571	10,812
Government	18,243	19,282	19,557	19,588
TOTAL	50,982	58,181	62,853	62,837

Source: State of Alaska Department of Labor, Labor Force Estimate by Industry
*Does not include the self-employed

Table 2.3.2.5

PERSONAL INCOME BY SOURCE AND
PER CAPITA INCOME, PIPELINE IMPACT AREA
(Millions of Dollars)

CENSUS DIVISION	Wages and Salaries**	Transfer Payments***	Personal Income***	Per Capita Income (Dollars)	Real Per Capita Income (1967 U.S. Dollars)
			1970		
Barrow-North Slope	38.0	1.0	38.4	14,420	8,767
Upper Yukon	2.5	1.2	3.4	2,019	1,229
Yukon Koyokuk	21.2	2.2	19.0	3,998	2,433
Fairbanks*	158.6	9.1	187.8	3,753	2,284
Anchorage	556.1	24.1	548.4	4,341	2,642
State Total	1217.7	79.0	1442.7	4,771	2,904
			1971		
Barrow-North Slope	26.9	1.3	27.2	9,481	5,715
Upper Yukon	6.4	1.6	6.5	3,689	2,224
Yukon-Koyokuk	20.3	2.8	18.3	3,828	2,307
Fairbanks*	214.9	12.1	193.2	3,989	2,404
Anchorage	627.1	31.6	623.0	4,588	2,766
State Total	1315.2	100.0	1573.2	5,027	3,030
			1972		
Barrow-North Slope	21.9	1.4	22.9	9,019	5,308
Upper Yukon	6.7	1.6	21.5	11,832	6,964
Yukon-Koyokuk	20.5	3.1	24.3	5,053	2,974
Fairbanks*	237.9	14.2	273.6	5,453	3,210
Anchorage	704.2	39.6	823.9	5,713	3,363
State Total	1447.1	114.0	1728.1	5,321	3,131

Table 2.3.2.5

PERSONAL INCOME BY SOURCE AND
PER CAPITA INCOME, PIPELINE IMPACT AREA
(Millions of Dollars)
(Cont'd)

1973

DIVISION	Wages and Salaries**	Transfer Payments***	Personal Income***	Per Capita Income (Dollars)	Real Per Capita Income (1967 U.S. Dollars)
Barrow-North Slope	19.6	7.1	26.4	10,221	5,821
Upper Yukon	9.4	4.3	13.8	8,338	4,748
Yukon-Koyokuk	24.3	8.8	34.1	6,710	3,821
Fairbanks*	248.8	21.4	292.1	5,859	3,337
Anchorage	745.6	58.7	888.4	5,945	3,386
State Total	1564.0	260.3	2002.8	6,058	3,450

1974

Barrow-North Slope	26.0	4.5	29.4	9,091	4,710
Upper Yukon	76.2	3.0	77.0	29,145	15,101
Yukon-Koyokuk	62.9	8.4	72.1	13,752	7,125
Fairbanks*	373.8	21.5	412.4	7,462	3,863
Anchorage	945.4	64.1	1098.7	7,176	3,718
State Total	2106.0	222.7	2509.4	7,146	3,703

Notes: * Fairbanks estimates include the Southeast Fairbanks Census Division.

** Civilian wages and salaries are as reported in Alaska Dept. of Labor Statistical Quarterly. Federal military wage and salary payments in Alaska were allocated to the census divisions, based on estimated military population in the Alaska Department of Labor Current Population Estimates.

*** Transfer payments and other components of personal income (see Table 23.1.3 were taken from U. S. Department of Commerce, Bureau of Economic Analysis, Personal Income by Major Sources 1970-74. State totals for Personal Income were taken from Kresge, "Alaska Economic Growth, 1961-1972" for 1970-72, and estimated in the same way for 1973-74.

very rapid growth in all but the Barrow-North Slope Census Division. As can be seen from the table, there has been a tremendous burst in wage and salary payments in each of the census divisions except Barrow-North Slope. In addition, most of these divisions show large increases in transfer payments from 1972 to 1973 because of payments to Natives of Federal monies under the terms of the Alaska Native Claims Settlement Act. These were accumulated for 1972, 1973, and 1974 fiscal years, pending certification of the Native rolls, and paid in January, 1974. In spite of the actual date of the payment, it appears that the Department of Commerce included the payment in their 1973 figures. In 1974, payments were made only in October, which accounts for most of the decline in transfers.

On a per capita basis, the Upper Yukon Census Division currently has incomes approximately four times the statewide average. This demonstrates the impressive power of an influx of unattached, highly paid workers to alter the incomes of a small population. Per capita wages in salaries went from $5,679 per person in 1973 to $28,842 in 1974, while the population of this census division increased by 60 percent in the same period. The Fairbanks and Anchorage areas also show impressive increases in wages and salaries paid; yet the wider population base and the lower average wage of workers hired outside the petroleum and construction sectors in these areas make the change in real per capita incomes much smaller. The Barrow-North Slope Division shows an uneven decline in real per capita incomes, with the boom in transfer payments in 1973 offsetting a three-year decline in wages and salaries in this area. Renewed employment opportunities in 1974 partly offset the decline in Native Claims payments, and Barrow per capita incomes remain above the state average. Upper Yukon and Yukon-Koyokuk have both been improving their per capita positions relative to the state.

There are at least three reasons why these statistics should be viewed with caution. Wages and salaries and other forms of cash income are the principal forms of income measured, yet it is known that unmeasured subsistence hunting and gathering activities are important contributors to the incomes of residents of the Barrow, Upper Yukon, and Yukon-Koyokuk Divisions (and possibly to some residents of the Fairbanks area). Thus, incomes in these areas do not accurately reflect actual standards of living. Secondly, the Alaska RPI is a statewide index; yet it is known that cost of purchased items such as food, fuel, and housing is much higher in the "bush" than in Anchorage, or even Fairbanks. Thus the same per capita income in the three rural census divisions most likely represents a lower standard of living. Third, much of the increase in wages and salaries reported in the census divisions imported by the TAPS pipeline are earned by transitory oil and gas industry workers, many of whom will likely leave the state at the conclusion of that pipeline project. Thus the per capita measure of income does not address the question of what the real incomes of

the "permanent" residents in the region are now, or how they have been influenced by pipeline construction and payments from the Alaska Native Fund.

Local Government

Local government in the areas which would be directly affected by construction under this proposal includes four basic jurisdictions -- Municipality of Anchorage, Fairbanks-North Star Borough, North Slope Borough, and miscellaneous small communities. As noted previously, local government in general receives a large portion of its revenues from the state, the bulk of which supports education. The growth in estimated full value of real and personal property in the first three communities is shown in Table 2.3.2.6. These values include, after 1973, the value of oil and gas exploration, production and transmission facilities in each community which is separately assessed by the state since it is subject to a state property tax. Assessment of property values is not presently carried out in the other communities directly adjacent to the proposed pipeline route, although the value of oil and gas production and transmission equipment is assessed in rural parts of the state, known as the Unorganized Borough. The bulk of this capital in the Unorganized Borough is associated with the trans-Alaska oil pipeline and would be taxable by the state, but not local communities as they are presently organized.

The value of property in each community is composed of elements in different proportion. Growth of the estimated full value of property in Anchorage has been strong and steady over the period, reflecting the most diversity of growth of the three communities. Of a total estimated full value of property of $2.935 billion in 1975, less than six million was directly attributed to the special category of oil and gas production and pipeline property assessed by the state. Much of the growth in values is related to petroleum activity but growth in other economic sectors has also been significant.

In Fairbanks, the 40 percent increase in estimated full value of property between 1974 and 1975 indicates a greater sensitivity of the tax base to petroleum activity. This is a result of both Fairbanks' role as a staging area for North Slope development and the TAPS line, and also the fact that the pipeline passes within the boundary of the community.

The North Slope Borough has seen the most rapid increase in its estimated full value of property as a result of petroleum development within its borders. Of a total estimated value in 1975 of $560 million, $430 million of that was in the oil and gas production and transmission category of property.

Table 2.3.2.6

ESTIMATED FULL VALUE OF PROPERTY, REAL AND PERSONAL
FOR SELECTED ALASKAN COMMUNITIES

(million of $)

	Municipality of Anchorage	Fairbanks City & North Star Borough	North Slope Borough	Unorganized Borough	Total State
1965	624,769	201,719			1,262,452
66	719,562	213,694			1,415,743
67	808,885	217,174			1,628,759
68	882,364	200,319			1,855,089
69	959,652	250,464			1,959,413
70	1,105,677	304,481			2,280,441
71	1,399,335	340,566			2,687,913
72	1,660,977	390,583	250,000		3,343,872
73	2,010,036	475,802	202,667		4,090,134
74	2,301,939	567,232	256,121		4,831,877
75	2,935,159	795,156	560,969	220,861	6,674,575

Source: Department of Community and Regional Affairs, State of Alaska
ALASKA TAXABLE, MUNICIPAL PROPERTY ASSESSMENTS AND FULL VALUE DETERMINATIONS, Juneau, annual

The property tax base for potentially impacted communities along the route of the pipeline outside of Anchorage, Fairbanks, and the North Slope Borough is not known, as no other community has established a property tax. However, there are no significant concentrations of industrial property in the area except for Alyeska pipeline related property, taxed by the state.

The sales tax is the other traditional source of revenue at the local government level. Anchorage Borough did not rely upon the sales tax as a revenue source (nor does the since-formed Municipality). Fairbanks city and Borough employ sales tax which varies among service areas within the Borough proper, and from year to year. In 1975, the rate in Fairbanks city was 5 percent and 2 percent in most outlying service areas of the Borough. In calendar year 1975, of total revenues to the general and special funds of $14.8 million for the city, $6.3 million came from the sales tax and $3.1 million from property taxes. Inter-governmental revenues amounted to $18.5 million.

The North Slope Borough employs a sales tax in addition to the property tax, which was between 2 percent and 3 percent in 1975, depending upon community within the Borough.

Second class cities are empowered to use a sales tax and all other organized local communities adjacent to the pipeline route are second class cities. Reliable information on these communities is sparse, but some have a sales tax of one or two percent which may vary from year to year. Second class cities include North Pole, in the Fairbanks Borough, Nuiqiut, Anaktuvik Pass, and Kaktovik, in the North Slope Borough, and Allakaket, Fort Yukon, and Delta Junction in the Unorganized Borough.

As with Alaska in general, the local communities along the route of the proposed pipeline receive a large portion of their revenues from the state government. The principal programs through which the transfers presently occur are the education foundation program and the local revenue sharing program. In fiscal year 1975, approximately $85 million was distributed state-wide for the foundation program. Preliminary 1975 fiscal year state revenue sharing with local governments is approximately $15 million. In extraordinary circumstances, impact grants are also provided to local communities by the state.

2.3.3 Economic Growth Without the Gas Pipeline

2.3.3.1 Methodology

The ISEGR Man-in-the-Arctic program has developed a series of computer simulation models which are designed specifically to analyze the long-range implication of changes in the major factors affecting the path of Alaskan economic and populaiton growth. These models are built on a series of economic and population studies for the time period since statehood. The economic models proceed sequentially to estimate gross product, employment, wages and salaries, personal income, and disposable personal income. The output of certain industries, designated the "support sector" (trade, public utilities, transportation, communications, finance, and services, plus a portion of the construction industry), is dependent upon the growth of Alaskan personal incomes, and since income is both a function of output and contributes to further output, output and income are simultaneously determined in the models. The population model computes additions in the state at any point, and adds net immigration, which has been found to be well predicted by increases and decreases in employment and real per capita income in Alaska relative to the Lower 48.[1] These models are used to project economic growth in Alaska in the following sections.

Even without the gas pipeline, Alaska's economy and population are expected to grow vigorously over the next fifteen years. However, many of the factors contributing to this growth are either determined by forces beyond the control of Alaskans, (such as the national policies pertaining to energy independence and oil and gas leasing in OCS areas), or while under the control of Alaskans, cannot be predicted with any confidence (for example, future production tax rates on oil). Consequently, the MAP researchers have projected several possible future patterns of hydrocarbon development in Alaska of varying intensity and probability. These cases are designed to explore the range of outcomes under different assumptions concerning factors exogenous to Alaska's growth.

The most conservative scenario, Limited Development, would limit future petroleum production to the existing areas being developed in Cook Inlet and in the vicinity of Prudhoe Bay, while restricting Federal lands development to the Gulf of Alaska and Lower Cook Inlet. With new oil being priced at $7 per barrel at the wellhead (about $11 per barrel delivered on the West Coast contiguous United States), state petroleum revenues would reach $1.3 billion in 1980 and $2.2 billion in 1990. Production would be about 3.0 billion barrels per day in 1985, and rise to 3.6 billion in 1990.

The most conservative scenario, Accelerated Development, features all the development in the Limited Scenario, plus National Petroleum Reserve 4 and adjacent areas. Federal offshore development moves into St. George's Basin and either the Beaufort or Chukchi Sea. The primary factor in this scenario is that NPR4 turns out to be as productive as Prudhoe Bay, draws additional exploration on state and native lands, and justifies the building of a second trans-Alaska oil pipeline. In this scenario, the state receives $1.4 billion per year in 1980 from petroleum taxes, royalties, and property taxes, and $3.1 billion per year by 1990. Production is about 4.9 billion barrels per day in 1985 and 7.3 billion per day in 1990.

The Maximum Development scenario is by far the least likely, since several technical problems would have to be solved for the offshore environments in the north Bering Sea and Chukchi Sea. It is by no means certian that $7 per barrel would permit these developments, which would go far beyond those in the Accelerated Development Case. In this scenario, several major lease sales are held on Federal OCS lands in the Bering and Chukchi Seas and Bristol Bay. These are productive enough to justify western Alaska oil pipeline and gas pipelines from Kotzebue to the west side of Cook Inlet. State oil and gas revenues stay at $1.4 billion per year in 1980, the same as the Accelerated case, but rise th $3.9 billion in 1990. Some additional leasing occurs in the lower Kuskokwim and onshore Bering and Chukchi Sea areas, but most developments are on Federal OCS lands.

2.3.3.2 Economic Growth

From these scenarios, none of which include the assumption of a gas line from Prudhoe Bay, simulations are carried out to give a range of possible future growth rates in the absence of a gas pipeline. The results were produced with the latest version of the MAP Regional Model and are reported in this section. The results are as follows:

Gross Product

Gross Product measures the value of all goods and services produced for final demand in Alaska and each of its regions and industries, and changes in this variable indicate the degree to which real output is expected to grow in Alaska in the absence of a gas pipeline. In addition to a statewide summary of results in Table 2.3.3.1, by region, an industry breakdown is provided for the two economic regions[2] of the state through which the pipeline will pass, Interior and Fairbanks, and for the Anchorage metropolitan area, which is heavily impacted by all economic development in the state.

Growth in economic output comes from two sources. In the exploration and development phases of oil development, there is a sharp increase in the level of employment in mining and construction. This increase in employment leads to increases in personal incomes in Alaska, and to increased demand for the services and goods produced in the support sector. In addition, the state and local governments begin to receive additional income, first from oil bonuses and income taxes, gross receipts taxes, and property taxes; and later, from oil production taxes and royalities. The picutre is similar in each of the three scenarios in the major impacted regions, although the levels are much different. In the middle case, Accelerated Development, Gross State Product rises to $4.7 billion in 1980, $5.0 billion in 1985, and $5.7 billion in 1990. Nineteen eighty and 1985 are within the period of construction of the second oil pipeline, and growth is substatial in all three areas. However, by 1990, most growth in output is centered in Anchorage. The Limited case does not include development of NPR4 or the second oil pipeline, so the level of development is much lower in each of the three regions. The Interior and Fairbanks regions are much more heavily dependent on the development of the North Slope than is Anchorage, even though much of the induced development under either scenario occurs in Anchorage. There is relatively little difference in real output from the middle case in Interior Fairbanks, when compared to the Maximum Development scenario, since most additional petroleum development takes place in southwest Alaska. However, Anchorage would grow anyway because it is a statewide general support, distribution, government, and financial center.

Table 2.3.3.1

GROSS STATE PRODUCT BY REGION
(Millions of 1958 Dollars)

LIMITED DEVELOPMENT

	Anchorage	Interior	Fairbanks	State
1978	902.991	365.265	232.159	2817.94
1979	950.11	374.737	238.331	3028.03
1980	1034.86	393.846	248.608	3522.34
1981	1083.31	339.069	257.444	3549.14
1982	1159.41	294.996	271.857	3569.56
1983	1233.03	243.86	283.788	3691.66
1984	1294.12	232.311	293.404	3743.07
1985	1346.57	233.024	301.496	3816.72
1986	1395.22	220.961	308.287	3855.42
1987	1454.02	218.769	315.536	3960.43
1988	1525.47	210.447	324.209	4101.96
1989	1601.62	208.547	334.214	4172.22
1990	1688.56	209.943	345.689	4228.62

ACCELERATED DEVELOPMENT

	Anchorage	Interior	Fairbanks	State
1978	947.025	424.651	234.457	3464.86
1979	1022.2	436.271	244.809	3749.91
1980	1142.18	527.393	256.677	4654.04
1981	1222.26	522.066	271.751	4937.84
1982	1346.96	511.391	299.08	4993.37
1983	1476.32	457.842	319.94	5191.42
1984	1547.09	388.078	328.88	4927.8
1985	1602.55	391.435	336.3	4972.65
1986	1682.46	413.745	348.673	5104.44
1987	1777.45	415.76	360.325	5271.84
1988	1896.94	432.802	373.911	5564.98
1989	2009.06	425.191	388.939	5632.39
1990	2128.2	415.824	404.428	5687.82

MAXIMUM DEVELOPMENT

	Anchorage	Interior	Fairbanks	State
1978	947.025	424.651	234.457	3464.86
1979	1022.2	436.271	244.809	3749.91
1980	1163.83	529.287	259.435	4701.96
1981	1272.11	525.327	278.457	5102.93
1982	1429.75	516.203	307.902	5333.82
1983	1610.49	459.697	328.707	6017.41
1984	1729.52	390.358	344.266	5868.07
1985	1817.01	394.237	356.658	5987.88
1986	1977.74	416.964	371.829	6582.59
1987	2191.3	420.572	394.91	7209.43
1988	2441.35	439.569	422.494	7986.83
1989	2661.06	433.463	449.07	8350.46
1990	2921.44	425.538	475.872	8969.41

The distribution of economic growth which would occur without the gas pipeline differs between the three regions, no matter which scenario is adopted. (Tables 2.3.3.2, 2.3.3.3, 2.3.3.4, 2.3.3.5). Interior (basically, the northern half of the pipeline corridor) generates over three-fourths of its real output in mining, with only government providing any stable pattern of growth. Anchorage, on the other hand, accounts for only 14 percent of its total output in mining in 1980, and this declines to about seven percent in 1990 in the Accelerated case, accounting for three percent of the total growth. Government output accounts for only about five percent of the growth in values of output in Anchorage in this case, the support sector being most important. Fairbanks growth is more heavily dependent on government than Anchorage, if the gas pipeline is not built and government spending follows past regional patterns. About 13 percent of Fairbanks' growth in gross product occurs in state and local government. In the Limited Development case, total output in the Interior region is only about 50 percent of either the Accelerated or Maximum case, but it is again heavily concentrated in mining. Anchorage 1978-1990 Maximum growth is about 1.4 times the Accelerated case with about nine percent of the growth occuring in mining, and three percent in state and local government. In the Limited case, Anchroage output grows 67 percent as much as in the Accelerated case but mining actually delcines slightly between 1978 and 1990, while state and local government accounts for six percent of the total increase in gross product. In all three cases the support sector is of major importance demonstrating Anchorage's role as a support base for the entire state. The Fairbanks region also has total output rising about 1.4 times as much as the Maximum as in the Accelerated case, and about 67 percent of the Accelerated, in the Limited case. Construction provides part of the difference of the two higher cases from the Limited; while much of the rest of the difference is in the level of state government output and the consequent different levels of output in the support sectors.

In each case, Anchorage grows significantly faster than the state as a whole in the absence of gas pipeline development. Fairbanks also grows faster than the state in the Accelerated case, but slower than the state in the Maximum and Limited scenarios. This reflects Fairbanks' importance as a regional supply center which has relatively low growth rates when development is somewhere other than the regions served by Fairbanks. Interior has a very small unstable economy which is strongly influenced by major construction and development within its boundaries, but which grows much slower over the long term chan the state as a whole.

Employment

Statewide employment by 1990 varies from 336,096 for the Limited Development scenario to 525,404 for the Maximum Development

Table 2.3.3.2

ACCELERATED DEVELOPMENT: GROSS PRODUCT BY INDUSTRY, Interior Region

(Millions of 1958 Dollars)

	Ag. Fish. Forest	Mining	Construction	Manufacturing
1978	0.	366.315	4.202	0.
1979	0.	380.158	2.067	0.
1980	0.	468.275	1.	0.
1981	0.	436.052	10.131	0.
1982	0.	385.894	20.645	0.
1983	0.	339.419	18.985	0.
1984	0.	313.231	5.98	0.
1985	0.	322.481	3.49	0.
1986	0.	347.945	1.	0.
1987	0.	347.945	1.	0.
1988	0.	361.664	1.	0.
1989	0.	352.222	1.	0.
1990	0.	341.121	1.	0.

	Transportation Communications Public Utilities	Finance	Services
1978	26.218	0.1	13.631
1979	26.671	0.1	12.808
1980	27.569	0.1	14.946
1981	29.694	0.1	27.579
1982	32.356	0.1	48.984
1983	32.751	0.1	43.376
1984	30.823	0.1	19.075
1985	30.866	0.1	16.114
1986	31.263	0.1	15.152
1987	32.027	0.1	16.055
1988	32.984	0.1	17.834
1989	33.774	0.1	18.506
1990	34.575	0.1	19.109

		Government			Region
	Trade	Total	Federal	State	Total
1978	4.443	9.743	6.202	3.541	424.651
1979	4.239	10.228	6.202	4.026	436.271
1980	4.761	10.742	6.202	4.54	527.393
1981	7.547	10.964	6.202	4.763	522.066
1982	11.625	11.788	6.202	5.586	511.391
1983	10.609	12.602	6.202	6.401	457.842
1984	5.72	13.149	6.202	6.947	388.078
1985	5.039	13.346	6.202	7.144	391.435
1986	4.811	13.476	6.202	7.274	413.745
1987	5.024	13.611	6.202	7.409	415.76
1988	5.438	13.783	6.202	7.581	432.802
1989	5.591	13.998	6.202	7.797	425.191
1990	5.728	14.192	6.202	7.99	415.824

Table 2.3.3.3

ACCELERATED DEVELOPMENT: GROSS PRODUCT BY INDUSTRY, Anchorage Region

(Millions of 1958 Dollars)

	Ag. Fish Forest	Mining	Construction	Manufacturing
1978	0.1	131.444	45.774	21.
1979	0.1	135.677	48.708	22.6
1980	0.1	169.694	51.812	24.5
1981	0.1	174.232	54.479	26.4
1982	0.1	169.142	59.077	28.8
1983	0.1	170.246	63.711	31.1
1984	0.1	162.981	67.093	33.7
1985	0.1	163.639	69.304	36.4
1986	0.1	165.837	72.169	39.7
1987	0.1	169.031	75.371	43.
1988	0.1	175.898	79.117	46.9
1989	0.1	172.68	83.002	51.
1990	0.1	168.039	87.1	55.5

	Transportation Communications Public Utilities	Finance	Services
1978	182.888	125.107	85.523
1979	199.2	139.314	95.6
1980	221.007	155.023	106.787
1981	241.265	169.065	116.821
1982	272.651	194.436	135.024
1983	302.365	221.469	154.513
1984	316.224	242.098	169.444
1985	327.401	255.992	179.525
1986	345.476	274.471	192.964
1987	367.773	295.736	208.469
1988	395.662	321.448	227.27
1989	423.03	349.034	247.5
1990	452.398	379.14	269.644

		Government			Region
	Trade	Total	Federal	State	Total
1978	190.106	165.084	114.167	50.917	947.025
1979	209.637	171.367	114.167	57.2	1022.2
1980	235.206	178.057	114.167	63.89	1142.18
1981	259.05	180.846	114.167	66.679	1222.26
1982	296.007	191.727	114.167	77.56	1346.96
1983	330.319	202.497	114.167	88.33	1476.32
1984	345.767	209.685	114.167	95.518	1547.09
1985	358.001	212.185	114.167	98.018	1602.55
1986	377.954	213.792	114.167	99.625	1682.46
1987	402.489	215.481	114.167	101.314	1777.45
1988	432.877	217.667	114.167	103.5	1896.94
1989	462.258	220.455	114.167	106.288	2009.06
1990	493.325	222.952	114.167	108.785	2128.2

Table 2.3.3.4

ACCELERATED DEVELOPMENT: GROSS PRODUCT BY INDUSTRY, Fairbanks Region

(Millions of 1958 Dollars)

	Ag. Fish. Forest	Mining	Construction	Manufacturing
1978	0.1	28.802	14.646	3.9
1979	0.1	28.802	13.984	4.2
1980	0.1	28.802	14.665	4.5
1981	0.1	28.802	17.557	5.
1982	0.1	28.802	20.888	5.3
1983	0.1	28.802	20.737	5.8
1984	0.1	28.802	17.07	6.3
1985	0.1	28.802	16.409	6.9
1986	0.1	31.911	15.853	7.4
1987	0.1	31.911	16.056	8.
1988	0.1	31.911	16.354	8.7
1989	0.1	31.911	16.476	9.5
1990	0.1	31.911	16.601	10.3

	Transportation Communication Public Utilities	Finance	Services
1978	43.807	20.99	16.463
1979	46.923	22.229	17.436
1980	50.062	23.441	18.389
1981	54.137	24.979	19.597
1982	61.593	27.705	21.739
1983	67.864	29.902	23.466
1984	71.434	31.12	24.424
1985	73.957	31.962	25.085
1986	77.352	33.077	25.962
1987	81.34	34.364	26.974
1988	85.936	35.821	28.119
1989	91.032	37.406	29.365
1990	96.359	39.028	30.641

	Trade	Government			Region Total
		Total	Federal	State	
1978	36.642	69.108	45.927	23.181	234.457
1979	39.567	71.569	45.927	25.642	244.809
1980	42.516	74.202	45.927	28.275	256.677
1981	46.338	75.241	45.927	29.314	271.751
1982	53.354	79.598	45.927	33.671	299.08
1983	59.359	83.91	45.927	37.983	319.94
1984	62.87	86.76	45.927	40.833	328.88
1985	65.383	87.701	45.927	41.774	336.3
1986	68.736	88.283	45.927	42.356	348.673
1987	72.678	88.902	45.927	42.975	360.325
1988	77.243	89.728	45.927	43.801	373.911
1989	82.345	90.804	45.927	44.877	388.939
1990	87.723	91.765	45.927	45.838	404.428

Table 2.3.3.5

ACCELERATED DEVELOPMENT: GROSS PRODUCT BY INDUSTRY, State

(Millions of 1958 Dollars)

	Ag. Fish. Forest	Mining	Construction	Manufacturing
1978	32.9	1809.65	101.89	152.8
1979	33.3	1983.76	103.233	159.4
1980	33.7	2765.87	108.691	166.3
1981	34.	2862.88	144.088	171.9
1982	34.2	2606.06	187.119	178.1
1983	34.6	2611.38	199.203	184.4
1984	35.	2344.8	167.612	191.3
1985	35.3	2349.78	157.217	198.5
1986	35.6	2391.95	152.032	206.4
1987	36.	2431.09	156.817	214.7
1988	36.4	2570.38	160.777	223.9
1989	36.8	2476.81	168.018	233.3
1990	37.2	2362.21	175.461	243.7

	Transportation Communication Public Utilities	Finance	Services
1978	378.731	178.058	150.429
1979	406.438	195.426	162.889
1980	431.373	212.795	178.57
1981	489.598	230.227	205.823
1982	587.333	261.349	252.815
1983	630.801	293.385	272.953
1984	601.01	317.37	266.079
1985	600.261	331.661	273.264
1986	620.403	352.758	287.849
1987	653.84	377.31	307.316
1988	694.948	406.79	331.129
1989	735.894	437.979	355.728
1990	779.396	471.514	382.152

	Trade	Government			Region Total
		Total	Federal	State	
1978	294.668	365.741	216.441	149.3	3464.86
1979	321.651	383.82	216.441	167.379	3749.91
1980	353.668	403.077	216.441	186.636	4654.04
1981	388.271	411.059	216.441	194.618	4937.84
1982	443.972	442.428	216.441	225.987	4993.37
1983	491.238	473.471	216.441	257.03	5191.42
1984	510.477	494.166	216.441	277.725	4927.8
1985	525.356	501.324	216.441	284.883	4972.65
1986	551.552	505.907	216.441	289.466	5104.44
1987	584.051	510.73	216.441	294.29	5271.84
1988	623.67	516.989	216.441	300.548	5564.98
1989	662.882	524.991	216.441	308.551	5632.39
1990	704.039	532.157	216.441	315.717	5687.82

case, while the middle case projects statewide employment to be 408,913 by 1990. (Table 2.3.3.6) For each case, the Anchorage region will account for roughly 55 percent of total statewide employment by 1990, whereas roughly 45 percent of statewide employment occurs in this region now. Owing to the nature of the development scenarios, neither Fairbanks nor the Interior employment is as responsive as Anchorage employment over the long run to the different envisioned development patterns. As with gross product, this is because of Anchorage's importance as a control center for development activities in all state regions. For example, the Interior region employment peaks coincidentally with the Prudhoe Bay and NPR4 field development in 1983 and remains stable throughout the remainder of the forecast period, showing no additional impact from development along Alaska's west coast as envisioned in the Accelerated and Maximum cases.

Employment by industry (Tables 2.3.3.7, 2.3.3.8, 2.3.3.9) in the three regions considered shows that in Anchorage, the service industry in particular and the support industries in general experience the greatest growth in employment. The Interior region shows a relatively constant level of employment concentrated in mining, some minor growth in government, and a brief upsurge in construction employment during NPR4 development (1982-1983). Impacted sectors in the Fairbanks region are concentrated in the support sectors, specifically service and trade and in government employment. This result is rather obvious as Fairbanks is the logical support center for development North of the Yukon River.

Statewide, with the exception of the renewable resource industries, employment grows substantially for all industries by 1990. (Table 2.3.3.10) Major growth industries are forecasted to include mining, construction, transportation, finance, services, trade, and government.

Payroll (Wages and Salaries)

Payroll is related to employment by wage rate. Wage rate differences between economic sectors will help determine the differences of payrolls in the projections. Employment growth in the support sectors will tend to have less impact than growth in mining or construction on payroll.

Statewide real (corrected for inflation) wages and salaries are projected to range from $2698.5 million for the Limited Development case, to $3306.6 million for the Accelerated case to $4266.1 million for the Maximum Development case by 1990. (Table 2.3.3.11) In 1974, total statewide payroll was just over $1 billion. (See Table 2.3.1.4.)

Table 2.3.3.6

EMPLOYMENT BY REGION
(Thousands of Wage Earners)

LIMITED DEVELOPMENT

	Anchorage	Interior	Fairbanks	State
1978	99.071	7.271	29.567	210.781
1979	104.407	6.98	30.462	219.48
1980	112.439	7.103	31.669	234.322
1981	118.111	6.708	32.605	243.869
1982	127.362	6.495	34.327	260.103
1983	135.574	6.141	35.628	274.709
1984	142.051	6.111	36.522	284.659
1985	147.52	6.153	37.234	291.512
1986	152.576	6.047	37.748	297.538
1987	158.23	6.048	38.232	304.749
1988	165.166	6.003	38.862	313.557
1989	172.858	6.034	39.618	323.949
1990	181.776	6.116	40.508	336.096

ACCELERATED DEVELOPMENT

	Anchorage	Interior	Fairbanks	State
1978	101.736	7.867	29.887	216.69
1979	109.716	7.721	31.188	230.724
1980	119.086	8.445	32.722	249.439
1981	126.293	10.663	34.245	267.188
1982	140.309	13.665	37.406	298.641
1983	154.627	12.982	39.849	323.586
1984	164.377	9.258	40.89	331.487
1985	170.526	8.757	41.581	337.716
1986	178.431	8.528	42.337	347.247
1987	187.562	8.653	43.274	360.179
1988	198.711	8.954	44.384	375.867
1989	210.447	9.022	45.623	392.096
1990	222.993	9.068	46.85	408.913

MAXIMUM DEVELOPMENT

	Anchorage	Interior	Fairbanks	State
1978	101.736	7.867	29.887	216.69
1979	109.716	7.721	31.188	230.724
1980	120.908	8.578	32.924	253.069
1981	130.76	10.912	34.984	276.28
1982	147.113	14.003	38.395	315.247
1983	164.193	13.156	40.954	353.58
1984	178.604	9.529	42.815	369.133
1985	187.733	9.111	44.095	376.06
1986	200.93	8.919	45.136	401.514
1987	220.487	9.239	47.377	434.813
1988	243.331	9.777	50.018	465.456
1989	265.184	10.019	52.419	493.995
1990	289.789	10.221	54.709	525.404

Table 2.3.3.7

ACCELERATED DEVELOPMENT:
EMPLOYMENT BY INDUSTRY, ANCHORAGE REGION
(Thousands of Wage Earners)

	Ag, Fish, Forest	Mining	Construction	Manufacturing
1978	0.086	1.514	6.603	1.82
1979	0.087	1.554	6.493	1.96
1980	0.088	1.868	6.951	2.118
1981	0.089	1.909	7.347	2.281
1982	0.09	1.863	8.034	2.473
1983	0.091	1.873	8.733	2.666
1984	0.091	1.807	9.245	2.876
1985	0.092	1.813	9.582	3.099
1986	0.093	1.833	10.02	3.363
1987	0.094	1.862	10.511	3.631
1988	0.095	1.924	11.089	3.938
1989	0.096	1.895	11.691	4.264
1990	0.097	1.853	12.329	4.612

	Transportation Communications Public Utilities	Finance	Services	Trade
1978	7.532	4.632	15.616	18.113
1979	8.11	5.192	17.634	19.873
1980	8.901	5.815	19.897	21.95
1981	9.626	6.375	21.945	23.827
1982	10.689	7.394	25.701	26.924
1983	11.637	8.489	29.773	29.992
1984	11.965	9.33	32.925	31.926
1985	12.257	9.899	35.068	33.296
1986	12.774	10.659	37.941	35.234
1987	13.421	11.536	41.279	37.501
1988	14.229	12.603	45.356	40.243
1989	14.968	13.753	49.778	43.047
1990	15.736	15.015	54.656	46.048

	Government Total	Federal	State and Local	Self Employed	Region Total
1978	37.556	23.6	13.956	8.803	101.736
1979	39.319	23.6	15.719	9.494	109.716
1980	41.2	23.6	17.6	10.297	119.086
1981	41.986	23.6	18.386	10.908	126.293
1982	45.059	23.6	21.459	12.082	140.309
1983	48.11	23.6	24.51	13.264	154.627
1984	50.151	23.6	26.551	14.06	164.377
1985	50.861	23.6	27.261	14.559	170.526
1986	51.318	23.6	27.718	15.196	178.431
1987	51.799	23.6	28.199	15.928	187.562
1988	52.421	23.6	28.821	16.814	198.711
1989	53.215	23.6	29.615	17.739	210.447
1990	53.926	23.6	30.326	18.721	222.993

Table 2.3.3.8

ACCELERATED DEVELOPMENT:
EMPLOYMENT BY INDUSTRY, INTERIOR REGION
(Thousands of Wage Earners)

	Ag, Fish, Forest	Mining	Construction	Manufacturing
1978	0.	2.582	0.531	0.
1979	0.	2.662	0.261	0.
1980	0.	3.16	0.126	0.
1981	0.	2.98	1.281	0.
1982	0.	2.695	2.611	0.
1983	0.	2.425	2.401	0.
1984	0.	2.27	0.756	0.
1985	0.	2.325	0.441	0.
1986	0.	2.475	0.126	0.
1987	0.	2.475	0.126	0.
1988	0.	2.555	0.126	0.
1989	0.	2.5	0.126	0.
1990	0.	2.435	0.126	0.

	Transportation Communications Public Utilities	Finance	Services	Trade
1978	0.517	0.002	1.08	0.78
1979	0.51	0.002	1.032	0.743
1980	0.508	0.002	1.154	0.839
1981	0.519	0.002	1.802	1.358
1982	0.534	0.002	2.737	2.133
1983	0.526	0.002	2.506	1.938
1984	0.494	0.002	1.378	1.016
1985	0.483	0.002	1.219	0.89
1986	0.476	0.002	1.166	0.848
1987	0.473	0.002	1.216	0.887
1988	0.471	0.002	1.313	0.964
1989	0.468	0.002	1.348	0.992
1990	0.466	0.002	1.38	1.017

	Government Total	Federal	State and Local	Self Employed	Region Total
1978	2.265	1.3	0.965	0.11	7.867
1979	2.401	1.3	1.101	0.111	7.721
1980	2.545	1.3	1.245	0.111	8.445
1981	2.608	1.3	1.308	0.112	10.663
1982	2.84	1.3	1.54	0.112	13.665
1983	3.071	1.3	1.771	0.113	12.982
1984	3.226	1.3	1.926	0.114	9.258
1985	3.282	1.3	1.982	0.114	8.757
1986	3.319	1.3	2.019	0.115	8.528
1987	3.358	1.3	2.058	0.115	8.653
1988	3.407	1.3	2.107	0.116	8.954
1989	3.468	1.3	2.168	0.116	9.022
1990	3.524	1.3	2.224	0.117	9.058

Table 2.3.3.9

ACCELERATED DEVELOPMENT,
EMPLOYMENT BY INDUSTRY, FAIRBANKS REGION
(Thousands of Wage Earners)

	Ag, Fish, Forest	Mining	Construction	Manufacturing
1978	0.013	0.341	1.883	0.375
1979	0.013	0.341	1.8	0.402
1980	0.013	0.341	1.896	0.429
1981	0.013	0.341	2.274	0.471
1982	0.013	0.341	2.709	0.497
1983	0.013	0.341	2.693	0.541
1984	0.013	0.341	2.216	0.588
1985	0.014	0.341	2.131	0.64
1986	0.014	0.371	2.06	0.683
1987	0.014	0.371	2.088	0.733
1988	0.014	0.371	2.129	0.792
1989	0.014	0.371	2.146	0.859
1990	0.014	0.371	2.163	0.925

	Transportation Communications Public Utilities	Finance	Services	Trade
1978	1.876	0.809	2.88	3.841
1979	1.994	0.862	3.064	4.068
1980	2.111	0.915	3.245	4.29
1981	2.262	0.981	3.475	4.567
1982	2.535	1.101	3.887	5.044
1983	2.761	1.199	4.221	5.434
1984	2.889	1.253	4.407	5.659
1985	2.978	1.291	4.536	5.82
1986	3.098	1.341	4.707	6.028
1987	3.238	1.399	4.905	6.265
1988	3.398	1.466	5.13	6.532
1989	3.575	1.538	5.375	6.821
1990	3.758	1.612	5.628	7.118

	Government Total	Federal	State and Local	Self Employed	Region Total
1978	15.759	9.4	6.359	2.111	29.887
1979	16.46	9.4	7.06	2.184	31.188
1980	17.212	9.4	7.812	2.268	32.722
1981	17.51	9.4	8.11	2.35	34.245
1982	18.763	9.4	9.363	2.515	37.406
1983	20.008	9.4	10.608	2.638	39.849
1984	20.834	9.4	11.434	2.689	40.89
1985	21.108	9.4	11.708	2.722	41.581
1986	21.277	9.4	11.877	2.759	42.337
1987	21.457	9.4	12.057	2.804	43.274
1988	21.697	9.4	12.297	2.856	44.384
1989	22.01	9.4	12.61	2.914	45.623
1990	22.29	9.4	12.89	2.971	46.85

Table 2.3.3.10

ACCELERATED DEVELOPMENT:
EMPLOYMENT BY INDUSTRY, STATE
(Thousands of Wage Earners)

	Ag, Fish, Forest	Mining	Construction	Manufacturing
1978	1.093	8.233	13.433	11.228
1979	1.105	8.676	13.71	11.708
1980	1.116	12.17	14.491	12.204
1981	1.126	12.617	19.13	12.645
1982	1.137	12.109	24.86	13.132
1983	1.148	12.217	26.556	13.634
1984	1.16	11.491	22.596	14.183
1985	1.172	11.561	21.321	14.76
1986	1.183	11.779	20.768	15.384
1987	1.196	12.102	21.516	16.046
1988	1.207	12.78	22.196	16.776
1989	1.219	12.463	23.285	17.527
1990	1.231	12.005	24.407	18.347

	Transportation Communications Public Utilities	Finance	Services	Trade
1978	15.18	6.666	26.154	30.286
1979	16.045	8.051	31.745	32.745
1980	16.949	8.051	31.745	35.457
1981	18.462	8.753	35.423	38.557
1982	20.705	10.018	41.752	43.728
1983	21.997	11.331	47.03	47.84
1984	21.698	12.323	49.589	49.667
1985	21.782	12.912	51.621	51.177
1986	22.37	13.788	54.872	53.624
1987	23.268	14.811	58.902	57.579
1988	24.375	16.043	63.744	60.12
1989	25.415	17.354	69.029	63.729
1990	26.493	18.769	74.783	67.538

	Government Total	Federal	State and Local	Self Employed	State Total
1978	85.559	44.7	40.859	18.853	216.69
1979	90.64	44.7	45.94	19.93	230.724
1980	96.967	44.7	51.367	21.19	249.439
1981	98.32	44.7	53.62	22.154	267.188
1982	107.2	44.7	62.5	24.001	298.641
1983	116.018	44.7	71.318	25.815	323.586
1984	121.912	22.7	77.212	26.87	331.487
1985	123.953	44.7	79.253	27.457	337.716
1986	125.26	44.7	80.56	28.219	347.247
1987	126.636	44.7	81.936	29.122	360.179
1988	128.423	44.7	83.723	30.203	375.867
1989	130.709	44.7	86.009	31.365	392.096
1990	132.758	44.7	88.058	32.582	408.913

Table 2.3.3.11

REAL WAGES AND SALARIES PAID BY REGION
(Millions of 1967 Dollars)

LIMITED DEVELOPMENT

	Anchorage	Interior	Fairbanks	State
1978	667.045	65.523	203.098	1467.57
1979	708.29	60.6	210.472	1510.33
1980	775.668	61.655	223.728	1644.06
1981	827.333	58.174	235.126	1736.83
1982	904.776	55.732	252.774	1874.12
1983	976.632	52.124	267.627	2006.08
1984	1038.58	52.197	280.099	2110.95
1985	1092.25	52.521	290.366	2180.46
1986	1144.33	51.569	299.456	2248.15
1987	1203.5	52.281	309.307	2338.68
1988	1273.63	52.457	320.723	2443.51
1989	1350.71	53.406	333.505	2562.53
1990	1439.1	54.864	347.955	2698.52

ACCELERATED DEVELOPMENT

	Anchorage	Interior	Fairbanks	State
1978	685.406	70.808	205.519	1513.49
1979	751.137	68.905	218.948	1634.74
1980	822.657	73.721	232.164	1768.29
1981	885.692	96.389	249.023	1943.07
1982	997.656	123.94	279.175	2213.66
1983	1114.59	117.518	303.701	2423.79
1984	1202.4	82.026	317.382	2492.45
1985	1260.89	76.189	326.868	2540.86
1986	1337.97	74.163	339.475	2647.23
1987	1425.73	76.065	354.082	2788.14
1988	1530.62	79.646	370.678	2954.84
1989	1641	80.947	388.814	3126.25
1990	1761.58	82.09	407.464	3306.56

MAXIMUM DEVELOPMENT

	Anchorage	Interior	Fairbanks	State
1978	685.406	70.808	205.519	1513.49
1979	751.137	68.905	218.948	1634.74
1980	841.051	76.465	236.511	1832.3
1981	922.694	99.721	257.57	2047.26
1982	1051.38	127.663	289.768	2336.13
1983	1183.42	118.539	312.841	2702.
1984	1305.77	83.617	333.478	2825.78
1985	1387.88	78.398	348.395	2860.2
1986	1505.7	76.664	363.904	3109.89
1987	1673.64	79.873	390.572	3417.95
1988	1870.26	85.063	421.777	3695.29
1989	2062.58	87.625	451.683	3964.65
1990	2280.03	89.947	481.609	4266.08

As in the case of GSP and employment, payrolls in the Interior region are projected to experience slow growth (actually declining in the Limited Development case) to 1990, with a major short-term increase in 1982 and 1983. In contrast, both Fairbanks and Anchorage experience substantial growth for all three cases, with Anchorage growing fastest. By 1980, well over half the payroll in the state will be paid in the Anchorage area.

Results of this payroll forecast by industry and region show that statewide, the support sectors and state and local government will account for the largest share of growth in wages and salaries. (Table 2.3.3.12) Construction and the Federal government will also continue to be important contributors of wage and salary income. Interestingly, by 1990 manufacturing is forecast to have a larger payroll than mining, a direct result of the capital intensive nature of the latter.

On a regional basis, Anchorage payroll growth behaves much the same as the state, with the support and government sectors accounting for a sizeable amount of overall growth in the payroll bill. Here manufacturing wages and salaries are forecast to increase dramatically from around $10 million in 1974 to $149.1 million in 1990. (See Table 2.3.3.13)

Mining is forecast to dominate payroll in the Interior region, with the support sectors and state and local government accounting for most growth to 1990 (increasing by 500 percent for state and local government over the forecast period). The construction payroll is forecast to rise in 1982 and 1983 and fall dramatically by 1990. (Table 2.3.3.14)

In Fairbanks, the support sectors and government are forecasted to continue as the major contributors to payroll and also to experience the most rapid growth. (Table 2.3.3.15) As in the case of Anchorage, the forecast for manufacturing shows a very large growth, as could be expected from growth in local demand for bakeries, dairies, and the like, which make up most of this sector.

(Editor's note: Real wages and salaries by region, Table 2.3.3.11, include payments to Natives under the Native Claims Settlement Act through a clerical error. This is never larger than 5 percent of the total in the largest case, and the amount of payments falls to zero by 1985. The impact section results are not influenced by the reporting error, nor is the regional distribution of any other variable in the three base cases.)

Table 2.3.3.12
ACCELERATED DEVELOPMENT: WAGES AND SALARIES BY INDUSTRY, State

(Millions of Dollars)

	Ag. Fish, Forest	Mining	Construction	Manufacturing
1978	24.777	219.252	344.303	182.475
1979	25.651	242.709	361.977	201.023
1980	26.545	359.328	393.986	221.306
1981	27.438	390.582	566.488	241.531
1982	28.389	392.943	787.856	264.311
1983	29.371	415.017	864.725	289.05
1984	30.425	407.021	731.389	316.887
1985	31.485	427.531	707.675	347.728
1986	32.565	455.245	707.538	382.085
1987	33.737	488.615	761.772	420.354
1988	34.887	539.877	816.72	463.548
1989	36.078	552.554	889.685	510.738
1990	37.326	560.654	968.2	564.202

	Transportation Communications Public Utilities	Finance	Services
1978	293.804	106.848	341.497
1979	328.625	125.713	397.167
1980	368.836	146.946	463.27
1981	423.398	170.122	545.74
1982	500.708	207.427	678.825
1983	565.368	249.983	807.615
1984	595.519	289.456	899.686
1985	635.551	323.437	990.29
1986	693.011	367.707	1112.41
1987	764.759	420.494	1261.99
1988	850.375	484.915	1443.36
1989	941.093	558.554	1651.7
1990	1041.59	643.579	1890.62

		GOVERNMENT			
	Trade	Total	Federal	State & Local	Region Total
1978	375.663	1446.34	714.99	731.352	3334.96
1979	424.741	1643.26	766.914	876.347	3750.87
1980	481.491	1866.71	822.478	1044.23	4328.41
1981	545.344	2044.07	882.146	1161.93	4954.71
1982	642.593	2389.22	945.986	1443.23	5892.27
1983	735.761	2769.65	1014.48	1755.17	6726.53
1984	800.333	3113.82	1088.12	2025.7	7184.53
1985	860.62	3383.5	1166.99	2216.51	7707.8
1986	940.963	3653.5	1251.6	2401.9	8345.02
1987	1035.94	3947.03	1342.48	2604.55	9134.68
1988	1148.65	4276.76	1439.74	2837.02	1.01F+04
1989	1269.89	4650.54	1543.91	3106.64	1.11F+04
1990	1403.64	5047.01	1655.98	3391.03	1.22F+04

Table 2.3.3.13

ACCELERATED DEVELOPMENT: WAGES AND SALARIES BY INDUSTRY
ANCHORAGE REGION
(Millions of Dollars)

	Agriculture, Forestry, Fisheries	Mining	Construction	Manufacturing
1978	0.971	40.376	139.17	31.372
1979	1.006	43.58	154.817	35.537
1980	1.043	55.082	172.143	40.429
1981	1.081	59.192	188.983	45.838
1982	1.119	60.735	214.629	52.386
1983	1.16	64.202	242.283	59.501
1984	1.188	65.133	266.434	67.638
1985	1.231	68.714	286.805	76.814
1986	1.275	73.05	311.507	87.905
1987	1.32	78.033	339.43	100.063
1988	1.367	84.78	371.917	114.48
1989	1.415	87.794	407.233	130.726
1990	1.465	90.274	446.083	149.148

	Transportation, Communications, Public Utilities	Finance	Services	Trade
1978	153.402	78.418	214.82	240.927
1979	174.987	93.525	255.947	275.485
1980	203.669	111.443	304.769	318.093
1981	233.542	129.999	354.773	361.031
1982	275.213	160.409	438.496	425.47
1983	317.896	195.924	536.267	493.106
1984	346.481	229.123	625.596	543.96
1985	376.204	258.639	703.247	589.696
1986	415.865	296.298	802.981	649.927
1987	463.662	341.248	922.149	720.691
1988	521.795	396.625	1,069.18	805.87
1989	582.626	460.448	1,238.57	897.252
1990	650.328	534.873	1,435.19	998.993

Table 2.3.3.13 (continued)

	Total Federal, State & Local Government	Federal Government	State & Local Government	Region Total
1978	660.049	389.321	270.728	1,559.5
1979	742.718	417.594	325.124	1,777.6
1980	835.956	447.85	388.106	2,042.63
1981	912.601	480.339	432.262	2,287.04
1982	1,052.9	515.101	537.797	2,681.36
1983	1,207.22	552.396	654.822	3,117.56
1984	1,348.81	592.493	756.316	3,494.36
1985	1,463.34	635.44	827.890	3,824.96
1986	1,578.96	681.513	897.45	4,217.77
1987	1,704.47	730.998	973.476	4,671.77
1988	1,844.64	783.954	1,060.69	5,210.66
1989	2,002.52	840.677	1,161.84	5,808.58
1990	2,170.23	901.702	1,268.53	6,476.58

Table 2.3.3.14

ACCELERATED DEVELOPMENT:
WAGES AND SALARIES BY INDUSTRY, INTERIOR, INTERIOR REGION

(Millions of Dollars)

	Ag. Fish, Forest	Mining	Construction	Manufacturing
1978	0.	73.042	19.275	0.
1979	0.	79.189	9.851	0.
1980	0.	98.842	4.949	0.
1981	0.	98.015	52.078	0.
1982	0.	93.198	110.222	0.
1983	0.	88.174	105.271	0.
1984	0.	86.793	34.445	0.
1985	0.	93.473	20.879	0.
1986	0.	104.629	6.213	0.
1987	0.	110.025	6.454	0.
1988	0.	119.426	6.703	0.
1989	0.	122.861	6.962	0.
1990	0.	125.837	7.231	0.

	Transportation Communications, Public Utilities	Finance	Services
1978	13.457	0.029	13.722
1979	13.822	0.031	13.837
1980	14.349	0.033	16.339
1981	15.291	0.035	26.925
1982	16.403	0.037	43.155
1983	16.893	0.039	41.702
1984	16.617	0.042	24.202
1985	16.987	0.045	22.594
1986	17.509	0.047	22.8
1987	18.215	0.051	25.101
1988	19.044	0.054	28.592
1989	19.846	0.057	31.003
1990	20.706	0.061	33.49

		GOVERNMENT			
	Trade	Total	Federal	State & Local	Region Total
1978	5.759	29.659	17.086	12.574	154.944
1979	5.719	33.622	18.327	15.295	156.071
1980	6.733	38.101	19.654	18.446	179.346
1981	11.366	41.736	21.08	20.655	245.446
1982	18.618	48.542	22.606	25.936	330.175
1983	17.644	56.033	24.243	31.791	325.756
1984	9.644	62.871	26.002	36.869	234.615
1985	8.808	68.337	27.887	40.45	231.124
1986	8.751	73.839	29.909	43.93	233.788
1987	9.55	79.814	32.081	47.734	249.21
1988	10.817	86.502	34.405	52.097	271.137
1989	11.612	94.052	36.894	57.158	286.393
1990	12.419	102.068	39.572	62.496	301.812

Table 2.3.3.15

ACCELERATED DEVELOPMENT: WAGES AND SALARIES BY INDUSTRY, Fairbanks Region

(Millions of Dollars)

	Ag. Fish, Forest	Mining	Construction	Manufacturing
1978	0.141	7.94	49.08	6.502
1979	0.145	8.35	48.733	7.365
1980	0.148	8.779	53.342	8.299
1981	0.152	9.232	66.424	9.589
1982	0.156	9.706	82.209	10.693
1983	0.16	10.205	84.868	12.301
1984	0.164	10.732	72.549	14.095
1985	0.181	11.284	72.447	16.217
1986	0.185	12.909	72.732	18.279
1987	0.189	13.575	76.573	20.76
1988	0.194	14.274	81.096	23.705
1989	0.199	15.007	84.891	27.166
1990	0.204	15.781	88.89	30.921

	Transportation Communications Public Utilities	Finance	Services
1978	37.368	11.415	38.305
1979	42.112	12.947	42.999
1980	47.284	14.612	48.059
1981	53.766	16.686	54.325
1982	64.056	19.919	64.12
1983	74.115	23.068	73.506
1984	82.278	25.66	80.959
1985	89.963	28.124	87.946
1986	99.287	31.086	96.316
1987	110.135	34.512	105.947
1988	122.687	38.453	116.923
1989	137.004	42.925	129.323
1990	152.927	47.883	142.882

		GOVERNMENT			
	Trade	Total	Federal	State & Local	Region Total
1978	47.143	265.369	142.569	122.8	463.263
1979	52.265	298.29	152.923	145.367	513.205
1980	57.687	335.498	164.002	171.496	573.709
1981	64.321	365.714	175.9	189.814	640.209
1982	74.625	422.227	188.63	233.597	747.71
1983	84.318	484.434	202.287	282.146	846.975
1984	91.875	541.223	216.971	324.253	919.534
1985	98.762	586.647	232.698	353.949	991.57
1986	106.979	632.374	249.57	382.804	1070.15
1987	116.343	682.035	267.691	414.344	1160.07
1988	126.95	737.61	287.084	450.526	1261.89
1989	138.784	800.344	307.856	492.489	1375.64
1990	151.628	866.954	330.203	536.752	1498.07

Personal Income, Population, Per Capita Income

As would be expected from the data on wages and salaries, Alaskan aggregate personal incomes grow substantially over the period of 1978 to 1990. While it is demonstrated in Table 2.3.3.16 that personal incomes for the state as a whole rise between 190 and 340 percent, in real terms, the growth rate is only 80 to 180 percent, and in real per capita terms 15 to 20 percent. This reflects the fact that even at growth rates in Alaska cost of living between 1978 and 1990, which are somewhat below those of the United States as a whole, the Alaska Relative Price Index shows an increase of 59 percent, equivalent to a 63 percent decline in purchasing power.

Furthermore, as was mentioned in connection with state and local spending, the MAP population model assumes that increases in real personal income will induce additional migration to Alaska; and therefore, additions to personal income will be "averaged" over a much larger population base than was present before incomes began to rise.

The projected regional distribution of population between 1978 and 1990 which the MAP models project in the absence of a gas pipeline is shown in Table 2.3.3.17. Except for the construction period, the model predicts much of the growth will occur in the Anchorage region. This follows from the relative growth in employment in Anchorage.

The MAP models do not give regional personal income estimates at this time; however, if it is assumed that the statewide non-wage personal income growth rate is applied to the regions as well, the resulting increases in regional total personal income would be shown in Table 2.3.3.18. No claim is made that these would be the incomes which would actually prevail. As a matter of fact, the the component of personal incomes, wages and salaries, grows at a rate faster than the state average in Anchorage, while the growth rate in this component is far below the state average in Fairbanks and the Interior, but it is unknown whether non-wage income grows at these or some other rates in each region. Under the assumptions given, Interior would see a decrease in real income during the period of 1978 through 1990 relative to 1974, in the most restricted case. However, in all other cases personal income in each region tends to rise. On a per capita basis, real personal income declines slightly in the Interior region while rising between 14 and 24 percent in the other regions, if the gas pipeline is not built. This compares with a statewide increase in real per capita income of between 15 and 21 percent between 1978 and 1990, in the absence of a gas pipeline. (Table 2.3.3.19)

Table 2.3.3.16

ALASKA PERSONAL INCOME AND PER CAPITA INCOME

	Personal Income (10^6 Dollars)	RIP	Real Personal Income (10^6 1967 Dollars)	Real Personal Income Per Capita (1967 Dollars)
LIMITED DEVELOPMENT				
1978	3,953.4	231.8	1,705.2	3,885.2
79	4,237.9	240.9	1,759.3	3,849.1
80	4,784.4	250.3	1,911.3	3,965.7
81	5,245.6	260.1	2,016.5	4,020.4
82	5,874.7	270.3	2,173.1	4,103.3
83	6,527.7	281.0	2,323.1	4,174.3
84	7,126.4	291.9	2,441.3	4,221.2
85	7,647.4	303.4	2,521.0	4,226.9
86	8,189.6	315.2	2,597.9	4,239.2
87	8,842.9	327.6	2,699.1	4,283.2
88	9,587.3	340.4	2,816.3	4,337.4
89	10,434.6	353.8	2,949.3	4,399.1
90	11,401.6	367.7	3,101.2	4,468.8
ACCELERATED DEVELOPMENT				
1978	4,076.0	231.8	1,758.1	3,927.3
79	4,567.1	240.9	1,896.0	4,006.0
80	5,140.7	250.3	2,053.6	4,062.7
81	5,859.5	260.1	2,252.4	4,192.1
82	6,921.8	270.3	2,560.5	4,357.7
83	7,863.8	281.0	2,798.6	4,424.6
84	8,391.5	291.9	2,874.8	4,371.7
85	8,894.8	303.4	2,932.1	4,316.4
86	9,617.5	315.2	3,050.9	4,335.6
87	10,512.0	327.6	3,208.5	4,384.1
88	11,557.3	340.4	3,394.9	4,446.6
89	12,688.5	353.8	3,586.3	4,504.3
90	13,924.0	367.7	3,787.2	4,562.8

Table 2.3.3.16 (Con't)

ALASKA PERSONAL INCOME AND PER CAPITA INCOME

	Personal Income (10^6 Dollars)	RIP	Real Personal Income (10^6 1967 Dollars)	Real Personal Income Per Capita (1967 Dollars)
MAXIMUM DEVELOPMENT				
1978	4,076.0	231.8	1,758.1	3,927.3
79	4,567.1	240.9	1,896.0	4,006.0
80	5,309.6	250.3	2,121.1	4,159.3
81	6,154.6	260.1	2,365.9	4,302.5
82	7,438.8	270.3	2,751.7	4,501.4
83	8,752.3	281.1	3,114.8	4,611.2
84	9,496.5	291.9	3,253.3	4,556.6
85	9,993.2	303.4	3,294.2	4,445.9
86	11,268.4	315.2	3,574.6	4,531.7
87	12,843.3	327.6	3,920.1	4,625.5
88	14,400.4	340.4	4,230.1	4,676.2
89	16,028.5	353.8	4,530.3	4,718.3
90	17,889.4	367.7	4,865.8	4,770.2

Table 2.3.3.17

POPULATION BY REGION
(Thousands of Persons)

LIMITED DEVELOPMENT

	Anchorage	Interior	Fairbanks	Statewide
1978	198.952	14.469	61.678	438.899
1979	210.093	13.937	63.959	457.069
1980	223.839	14.163	65.996	481.957
1981	235.107	13.56	68.008	501.552
1982	250.732	13.263	71.05	529.598
1983	265.861	12.744	73.579	556.537
1984	279.377	12.8	75.69	578.353
1985	292.135	12.968	77.718	956.402
1986	304.283	12.861	79.318	612.838
1987	316.941	12.925	80.642	630.162
1988	331.382	12.893	82.092	649.29
1989	346.721	12.989	83.681	670.422
1990	363.809	13.165	85.412	693.949

ACCELERATED DEVELOPMENT

	Anchorage	Interior	Fairbanks	Statewide
1978	203.377	15.541	62.11	447.653
1979	217.562	15.293	64.625	473.272
1980	234.92	16.6	67.814	505.487
1981	248.012	21.097	70.38	537.302
1982	269.163	27.165	75.133	587.559
1983	294.544	25.813	79.912	632.522
1984	316.595	18.732	83.564	657.574
1985	333.025	17.97	86.274	679.299
1986	350.821	17.673	88.498	703.69
1987	369.858	18.038	90.737	731.844
1988	391.877	18.706	93.116	763.496
1989	414.784	18.942	95.714	796.198
1990	439.247	19.13	98.271	830.02

MAXIMUM DEVELOPMENT

	Anchorage	Interior	Fairbanks	Statewide
1978	203.377	15.541	62.11	447.653
1979	217.377	15.293	64.625	473.272
1980	236.653	16.864	67.706	509.973
1981	253.56	21.556	71.126	549.886
1982	277.83	27.682	76.088	611.295
1983	306.096	25.742	80.542	675.488
1984	336.094	19.038	85.773	713.975
1985	360.206	18.622	90.286	740.954
1986	385.136	18.304	92.393	788.795
1987	419.28	18.989	96.406	847.494
1988	460.595	20.175	101.575	904.608
1989	501.265	20.839	106.575	960.158
1990	546.818	21.398	111.09	1020.03

Table 2.3.3.18

ESTIMATED REAL PERSONAL INCOMES RECEIVED, BY REGION
(Millions of 1967 Dollars)

Year	Anchorage	Interior	Fairbanks	State
1974 Civilian	975.5	140.1	351.4	2,261.3
Military	123.2	9.0	61.0	250.0
TOTAL	1,098.7	149.1	412.4	2,511.3
[1,2] 1974 Real Income (1967 $)	569.3	77.3	213.7	1,301.2
[3] LIMITED DEVELOPMENT				
1978	757.3	71.4	225.8	1,705.2
1980	877.2	68.3	249.2	1,911.3
1985	1,221.6	60.9	322.8	2,521.0
1990	1,592.0	64.8	386.3	3,101.2
[3] ACCELERATED DEVELOPMENT				
1978	778.3	76.9	228.9	1,758.1
1980	931.1	80.8	259.5	2,053.6
1985	1,409.5	85.9	364.3	2,932.1
1990	1,944.2	94.0	453.4	3,787.2
[3] MAXIMUM DEVELOPMENT				
1978	778.3	76.9	228.9	1,758.1
1980	950.8	83.7	264.1	2,121.1
1985	1,552.7	89.2	389.9	3,294.2
1990	2,507.7	104.8	538.9	4,865.8

1 Military payroll estimate of $250 million was divided among regions in the same proportions as 1974 military population, as estimated by the Alaska Dept. of Labor.

2 "Actual" Civilian incomes were computed using Alaska Dept. of Labor, STATISTICAL QUARTERLY, payrolls for 1974, and adding the other components of personal incomes as estimated by the U.S. Dept. of Commerce, Bureau of Economic Analysis. No residence adjustment was made.

3 Real wages and salaries were added to an estimate of non-wage income implied by statewide growth rates.

Table 2.3.3.19

ESTIMATED REAL PER CAPITA INCOME, BY REGION
(1967 Dollars)

	Anchorage	Interior	Fairbanks	State
LIMITED DEVELOPMENT				
1978	3,806	4,935	3,661	3885.2
1980	3,919	4,822	3,776	3965.7
1985	4,182	4,696	4,153	4226.9
1990	4,376	4,922	4,523	4468.8
ACCELERATED DEVELOPMENT				
1978	3,827	4,948	3,685	3927.3
1980	3,963	4,867	3,827	4062.7
1985	4,232	4,780	4,223	4316.4
1990	4,426	4,914	4,614	4562.8
MAXIMUM DEVELOPMENT				
1978	3,827	4,948	3,685	3927.3
1980	4,018	4,963	3,901	4159.3
1985	4,311	4,790	4,318	4445.9
1990	4,586	4,898	4,851	4770.2

State and Local Revenues and Expenditures

State and local revenues and expenditures are expected to grow quite rapidly, even without a gas pipeline. From a 1978 level of about $1.5 billion, state annual revenues are conservatively estimated to rise to between $4.6 and $7.5 billion in 1990 with $7 oil, depending upon the exact path of oil and gas development and the applicable features of the future tax structure. This is between 9 and 15 times the 1974 level of receipts. Local revenues are projected to rise from $530-550 million level in 1978 to between $2.3 and $4.3 billion in 1990. This is between 10 and 18 times 1974 levels. Part of local revenues would be shared revenues from the state, but even local revenues from local sources can be expected to grow to between $1.7 to $3.4 billion from 1990, compared with $330 to $340 million in 1974. (See Table 2.3.3.20)

Due to large populaiton increases accompanying development, backlogs of demand for services created by relatively low real per capita expenditures in the past and numerous other factors, Alaska's state and local governments are expected to increase expenditures rapidly, in spite of the existence of a permanent fund to save a substantial (25 percent) portion of the state's petroleum revenues. Expenditures by the state government, including revenue sharing, would rise from around $1.3 billion annually in 1978 (compared to $700-800 million in the current budget) to between $4.0 and $6.6 billion in 1990. Local government also expands rapidly, from $520-560 million in 1978 ($310 million in 1974) to between $2.3 and $4.2 billion in 1990.

In current dollar terms, state and local combined expenditures increase from three to seven times, In per capita terms, this growth in combined expenditures is much slower, ranging from 121 percent growth in the Limited case to 157 percent in the Maximum case. In real per capita terms, it is lower still. Total growth in real combined state and local expenditures ranges from $1610 to $1623 per capita in 1978, to $2241 to $2636 per capita in 1990. This reflects the state's inability to prevent migration in response to Alaska's increased real incomes and employment opportunities created by development and by state spending, and represents an increase of 1.4 to 1.6 times the 1978 level during the period 1978-1990, in the absence of a gas pipeline.

The distribution of future government revenue sources is also of interest. Without the pipeline, petroleum revenues provide about 53 percent of state revenues in 1978 and from 48 to 51 percent by 1990. The next largest source of state revenue is expected to be the individual income tax, which would provide about 7 percent of state revenues in 1978, and about 10 to 11 percent by 1990. Miscellaneous charges, revenues from miscellaneous taxes, etc. make up the next largest category, with about 9 percent of the total in 1990. The largest source of local revenue is the state government, with the property tax second. The property tax could become a larger source if local governments were to take maximum advantage of the state tax law which permits

Table 2.3.3.20

STATE AND LOCAL GOVERNMENT REVENUES AND EXPENDITURES
No Gas Pipeline (Millions of Dollars)

LIMITED DEVELOPMENT

	Individual Income Tax	Corporate Income Tax	Sales and Gross Receipts Taxes	Miscellaneous Taxes and Charges
1978	112.6	21.4	60.1	106.8
1979	132.0	25.5	67.0	124.5
1980	144.5	28.2	71.2	135.8
1981	169.1	33.7	79.3	158.1
1982	190.6	38.4	86.1	177.4
1983	220.8	45.3	95.1	204.5
1984	253.3	52.7	104.4	233.4
1985	283.8	59.9	112.9	260.5
1986	311.1	66.3	120.1	284.6
1987	340.0	73.2	127.6	310.1
1988	375.7	81.8	136.6	341.5
1989	417.3	91.9	146.7	377.9
1990	465.8	103.9	158.2	420.2
ACCELERATED DEVELOPMENT				
1978	119.8	22.9	62.7	113.3
1979	137.4	26.7	68.8	129.3
1980	159.2	31.5	76.1	149.1
1981	185.7	37.3	84.5	173.0
1982	220.1	45.1	94.9	203.8
1983	273.3	57.4	110.0	251.2
1984	322.6	69.0	123.1	294.7
1985	351.0	75.8	130.4	319.8
1986	378.5	82.5	137.3	344.0
1987	419.0	92.4	147.2	379.4
1988	470.3	105.0	159.2	424.1
1989	531.9	120.5	173.1	477.6
1990	600.5	137.9	188.1	536.9
MAXIMUM DEVELOPMENT				
1978	119.8	22.9	62.7	113.3
1979	137.4	26.7	68.8	129.3
1980	159.2	31.5	76.1	149.1
1981	193.7	39.1	87.0	180.1
1982	234.6	48.4	99.1	216.8
1983	300.1	63.7	117.2	274.9
1984	370.7	80.6	135.4	337.1
1985	412.1	90.7	145.5	373.4
1986	440.4	97.6	152.2	398.0
1987	514.7	116.1	169.3	462.7
1988	610.1	140.3	190.1	545.2
1989	707.8	165.6	210.4	629.3
1990	813.5	193.3	231.3	719.7

Table 2.3.3.20 (continued)

LIMITED DEVELOPMENT

	Petroleum Revenues	Total State Revenues	Total State Expenditures
1978	798.9	1,481.0	1,281.3
1979	996.6	1,764.8	1,515.7
1980	1,276.8	2,113.6	1,794.4
1981	1,375.8	2,325.4	1,981.5
1982	1,763.8	2,818.0	2,377.1
1983	1,979.8	3,175.1	2,680.2
1984	2,051.8	3,400.6	2,887.7
1985	2,116.8	3,614.9	3,085.7
1986	2,172.8	3,811.9	3,268.7
1987	2,180.8	3,968.7	3,423.5
1988	2,186.8	4,147.5	3,600.8
1989	2,192.8	4,346.7	3,798.6
1990	2,196.8	4,569.3	4,020.1
ACCELERATED DEVELOPMENT			
1978	798.9	1,503.8	1,304.1
1979	1,094.6	1,880.0	1,581.8
1980	1,374.8	2,262.5	1,894.3
1981	1,404.8	2,414.8	2,063.6
1982	1,877.8	3,035.2	2,565.7
1983	2,238.8	3,615.1	3,055.4
1984	2,490.8	4,081.8	3,459.1
1985	2,695.8	4,437.5	3,763.6
1986	2,883.8	4,778.5	4,057.6
1987	2,981.8	5,077.2	4,331.7
1988	3,044.8	5,380.9	4,619.7
1989	3,097.8	5,711.9	4,937.4
1990	3,102.8	6,021.9	5,246.2
MAXIMUM DEVELOPMENT			
1978	798.9	1,503.8	1,304.1
1979	1,094.6	1,880.0	1,581.8
1980	1,374.8	2,262.5	1,894.3
1981	1,502.8	2,538.6	2,138.4
1982	1,979.8	3,188.0	2,669.5
1983	2,263.8	3,735.3	3,169.3
1984	2,563.8	4,321.9	3,681.0
1985	2,845.8	4,800.3	4,088.8
1986	3,148.8	5,261.8	4,474.6
1987	3,393.8	5,827.9	4,979.5
1988	3,611.8	6,446.2	5,543.3
1989	3,786.8	7,036.9	6,090.2
1990	3,878.8	7,579.3	6,609.6

Table 2.3.3.20 (continued)

LIMITED DEVELOPMENT

	Total Local Revenues	Total Local Expenditures	State and Local Expenditures (Adjusted for Revenue Sharing)
1978	530.3	566.2	1,638.2
1979	634.4	660.1	1,927.9
1980	721.1	736.1	2,238.5
1981	836.8	850.6	2,511.6
1982	973.6	985.4	2,982.7
1983	1,130.5	1,139.3	3,395.9
1984	1,283.6	1,289.0	3,724.1
1985	1,432.1	1,433.6	4,039.7
1986	1,566.6	1,564.2	4,328.5
1987	1,707.2	1,700.5	4,599.2
1988	1,881.5	1,868.9	4,921.5
1989	2,086.7	2,066.6	5,291.1
1990	2,330.9	2,301.2	5,718.6
ACCELERATED DEVELOPMENT			
1978	557.7	593.5	1,684.5
1979	663.4	688.9	2,012.0
1980	788.2	802.6	2,389.0
1981	909.0	921.8	2,652.2
1982	1,110.9	1,120.2	3,278.1
1983	1,387.1	1,389.8	3,967.7
1984	1,641.2	1,636.6	4,562.6
1985	1,800.6	1,790.8	4,980.7
1986	1,955.7	1,940.4	5,385.9
1987	2,166.5	2,143.3	5,827.7
1988	2,431.4	2,397.5	6,333.2
1989	2,752.4	2,704.4	6,917.8
1990	3,113.8	3,048.7	7,532.8
MAXIMUM DEVELOPMENT			
1978	557.7	593.5	1,684.5
1979	663.4	688.9	2,012.0
1980	788.2	802.6	2,389.0
1981	949.5	961.8	2,755.5
1982	1,181.0	1,188.8	3,434.4
1983	1,510.3	1,509.7	4,185.4
1984	1,872.7	1,860.3	4,977.8
1985	2,105.7	2,084.8	5,556.3
1986	2,279.3	2,251.6	6,059.0
1987	2,679.5	2,634.8	6,882.9
1988	3,197.8	3,128.5	7,870.2
1989	3,741.2	3,643.8	8,865.8
1990	4,338.3	4,207.6	9,886.9

them to tax oil and gas production and transmission facilities at a maximum rate of 20 mills, replacing a state tax at the same maximum rate, which is included in Table 2.3.3.20 as part of petroleum revenues. In such a case, the state might be expected to equivalently reduce revenue sharing, resulting in the same total level of local income.

Government operations in the areas most likely to be affected by construction and operation of a gas pipeline will show varied patterns of development in future years. At present the MAP model is unable to project specific local revenue and expenditure patterns but it is clear that there will be significant departures from the statewide pattern in particular communities.

In Fairbanks, petroleum development--related activities will have a substantial direct effect on the tax base particularly as more development occurs in the northern portion of the state. For example, in 1975, 8 percent of the estimated full value of property within the borough was petroleum exploration, production and pipeline transportation property. In addition, property values in related industries and the residential and commercial sector will rise in response to development in the petroleum sector. The largest taxpayers in the borough and city are shown in Table 2.3.3.21.

Revenue available for the expansion of government services will expand most rapidly at the state level and will undoubtedly continue to be a major source of revenue to both Fairbanks City and the North Star Borough. General revenue sharing from the state to local governments is presently relatively small but large increases in in state revenues could lead to substantial increases in this program. The rationale is that a significant portion of the wealth producing property of the state is outside the taxing jurisdiction of the local communities and that the state should act as a tax collector who then would allocate the revenues to local governments.

The growth in local government services in the Fairbanks North Star Borough will probably not be able to smoothly accomodate population increase resulting from economic growth. This is a result of the high degree of uncertainty involved in petroleum exploration and development activities. Thus, not only will increases in required expenditures probably not correspond to increases in revenues, but the time constraints necessary to provide the services as needed will increase costs substantially. Here again, the state may be called upon to provide assistance to smooth out the cycle at the local level.

The North Slope Borough is in a somewhat different position. Economic development, and thus growth in the tax base, is more highly dependent upon development of the petroleum industry within its regions than is Fairbanks. It has presently a tax base consisting

Table 2.3.3.21

LARGEST TAXPAYERS WITHIN FAIRBANKS NORTH STAR BOROUGH

J. C. Penny	Retail Sales
Northward Operating Corporation	Apartment, Hotels, Commercial Buildings
Travelers Inn of Fairbanks	Hotel
The Lathrop Company	Commercial Rental
Bently Trust	Land
Fairview Development, Inc.	Apartments
Gavora, Inc.	Shopping Center
USSR&M	Mining Corporation
Safeway Stores, Inc.	Retail Grocery
Arthur J. Schaible, et al	Medical Clinic building
Second & Lacy Street Apartments, Inc.	Apartments
North Star, Inc.	Industrial Building Area
Nerland Corporation	Commercial Rental
Fairbanks Medical Center	Medical Clinic Building
Tanana Clinic	Medical Clinic Building
Medical & Dental Arts Building	Medical Clinic Building
Northern Commercial Company	Retail Sales
Nordstrom's	Retail Sales
Fairbanks Development Corporation	Apartment Rental
Polaris Investment Company	Hotel, Apartment Rental
King 8	Hotel
Chena View	Hotel

Source: Fairbanks North Star Borough, ANNUAL FINANCIAL REPORT 1974-75, City of Fairbanks, ANNUAL FINANCIAL REPORT 1975

of 77 percent of petroleum exploration, development and pipeline transmission property. This property is taxable by the state but the borough can recoup the revenues using its own property tax. It can do so, however, only up to limits established by the legislature so as to prevent both discriminatory taxation of this property within the borough and also a grossly inequitable statewide distribution of the revenues generated by the state property tax on the petroleum property. Principal taxpayers in the borough are listed in Table 2.3.3.22. Questions regarding the taxing jurisdicition of the borough in relation to the state and the formula for the sharing of revenues will undoubtedly continue to be a significant issue as petroleum development proceeds in Northern Alaska. The borough is presently in a strong financial position with a very low ratio of debt to values as shown in Table 2.3.3.23.

One other feature of importance to the futrue of local government in the North Slope Borough is the newly established Arctic Slope Regional Corporation which is nearly coterminous with the North Slope Borough. If the Corporation invests its assets in economic activity within the region, it could have a significant impact on the tax base of the Borough. The Corporation has followed that line of development thus far, by placing emphasis on the selection of lands which show the largest potential for mineral development within its territory. In addition, through subsidiaries, it has moved into petroleum exploration and development service related operations. This will have an impact on traditional local sources of revenues.

Expenditures for services will not need to expand as rapidly as the tax base grows because the increase in value of property will not be connected with a large influx of permanent residents. However, the Borough has a large capital development program under way which is designed to meet the public needs of the community. Some of these services represent a backlog of unmet demands within the community to bring its public facilities up to the level of other communities within Alaska. This activity will mean an increase in government expenditures in the Borough in the future years.

Other communities directly along the route of the pipeline are small and have only rudimentary levels of local government. None imposes a property tax and sales taxes are rare. The impact of growth on the finances and services of these communities will, in general, come through the extension of these state services provided by the state revenues.

Expansion of the tax base in the Municipality of Anchorage will proceed more regularly than either Fairbanks or the North Slope because the growth of the economy there is not as dependent upon petroleum development as these other communities. The estimated full value

Table 2.3.3.22

PRINCIPAL TAXPAYERS IN NORTH SLOPE BOROUGH

Alyeska Pipeline Service Company

SOHIO Petroleum Company

Atlantic Richfield Company

Mobil Oil Corporation

Alaska General Construction Company

Parker Drilling Company

Bechtel, Inc.

Rowan Drilling Company, U.S.

Kodiak Oil Field Haulers

Geophysical Services, Inc.

Western Geophysical Company

Atwood Enterprises, Inc.

Nabors Alaska Drilling

Puget Sound Tug & Barge Company

Source: North Slope Borough, ANNUAL FINANCIAL REPORT

Table 2.3.3.23

GENERAL OBLIGATION BOND STATUS OF
SELECTED ALASKA COMMUNITIES

MUNICIPALITY OF ANCHORAGE

	General Obligation Bonded Debt (million $)	Per Capita Debt $	Per Capita Valuation $	Rate of Debt to $
1966	41.917	345	5,709	6.04%
67	44.853	369	6,434	5.75%
68	58.719	483	6,961	6.94%
69	64.046	527	7,574	6.96%
70	66.734	536	8,724	6.14%
71	116.572	884	10,273	8.61%
72	171.441	1,189	11,099	10.71%
73	182.298	1,179	12,437	9.48%
74	210.371	1,295	13,468	9.61%
75	211.781	1,205	15,856	7.60%

FAIRBANKS CITY AND NORTH STAR BOROUGH

1966	15.939	514	5,178	9.93%
67	15.058	471	5,460	8.62%
68	15.613	488	5,697	8.56%
69	14.482	526	6,625	7.94%
70	13.233	432	6,594	6.55%
71	11.812	378	7,345	5.15%
72	12.470	382	8,159	4.67%
73	13.629	358	7,912	4.52%
74	14.828	354	8,246	4.30%
75	27.274	431	7,117	6.05%

Table 2.3.3.23(Con't)

GENERAL OBLIGATION BOND STATUS OF
SELECTED ALASKAN COMMUNITIES

NORTH SLOPE BOROUGH

	General Obligation Bonded Debt (million $)	Per Capita Debt $	Per Capita Valuation $	Rate of Debt to $
1973	------	---	N/A	------
74	------	---	56,203	------
75	9.000	1,337	38,539	3.47%

Source: ANNUAL FINANCIAL REPORTS, City of Anchorage, Greater Anchorage Area Borough, City of Fairbanks, Fairbanks North Star Borough, City of Barrow, North Slope Borough, and ALASKA TAXABLE

of property in the Anchorage Borough has grown at an annual 17 percent rate over the past decade. This strong growth should continue over the MAP projection period although the rate of growth will be dependent upon petroleum development elsewhere in the state. The value of property classified by the state as petroleum exploration, production, and transmission forms an insignificant portion of the value of property in the Borough since the majority of the land is either urban or state park. The largest taxpayers in the Borough according to recent annual reports are shown in Table 2.3.3.24. As with other local governments within the state, a significant portion of future revenues will continue to come from the state government because the Borough forms such a large portion of the population of the state.

Local expenditure growth in Anchorage will follow the state pattern more than other communities and will be rapid and steady as population growth continues in Anchorage. The requirement for increased public services for human needs in Anchorage will also be affected by the large number of dependents of petroleum workers who will reside in Anchorage while the family wage earners work in the camps located at the development sites.

Summary of Growth Without the Pipeline

On the whole, in the absence of a gas pipeline project, the economy of the state grows quite rapidly. Gross output goes up between 50 and 160 percent between 1978 and 1990; employment, between 60 and 140 percent, real personal income, between 80 and 180 percent; and population, between 60 and 130 percent. The results are different in the areas to be directly impacted by pipeline construction than they are in areas which will only receive the indirect benefits in the form of additional state spending. None of the directly impacted areas is "typical" when its expected growth pattern in the absence of the pipeline is compared to that of the state. Anchorage grows much faster. Gross output increases between 90 and 180 percent, and population between 80 and 170 percent. Interior shows either slight growth or some decline from 1978 to 1990 in the absence of a gas pipeline project. Gross output falls by nearly 40 percent in the lowest case, and shows no growth with Maximum Development. While employment booms to as much as 77 percent above 1978 employment in the absence of a gas pipeline during the early 1980's, over the whole period employment changes are expected to range anywhere from a 15 percent decrease to a thirty percent increase--far below the statewide rate. Population also will virtually stagnate in comparison to the state and to the faster growing regions. Fairbanks will not grow as slowly as Interior in absence of a gas pipeline, but it will generally grow at a rate slightly below the statewide average and at a far slower rate than that of Anchorage. Gross output will rise between 50 and 100 percent, while employment increases from 40 to 80 percent during the period, and population increases between 40 and 80 percent.

Table 2.3.3.24

LARGEST TAXPAYERS WITHIN THE ANCHORAGE MUNICIPALITY

Anchorage Natural Gas Company

Anchorage Westward Hotel

Carr's/Gottstein (Wholesale/Retail Trade)

Hickel Investment Company

J. C. Penney Company

Lathrop Corporation (Building and Theater Owner)

R.C.A. Alaska Communication, Inc.

Standard Oil Company of California

Union Oil Company

Wein Air Alaska

Source: Greater Anchorage Area Borough, ANNUAL FINANCIAL REPORT 1974-1975

FOOTNOTES

[1]For a more thorough explanation of the MAP models, see David T. Kresge, "Alaska's Growth to 1990," ALASKA REVIEW OF BUSINESS AND ECONOMIC CONDITIONS, University of Alaska Institute of Social, Economic, and Government Research, 13(1): January, 1976

[2]The MPA regions are combined groups of census divisions from the 1970 Census of Population. The regions are:

Northwest (Barrow, Kobuk, Nome)

Southwest (Aleutian Islands, Bethel, Bristol Bay, Kuskokwim, Wade Hampton)

Southeast (Juneau, Ketchikan, Haines, Skagway-Yakutat, Prince of Wales, Sitka, Wrangell-Petersburg, Outer Ketchikan Angoon.

Southcentral (Cordova-McCarthy, Kenai-Cook Inlet, Kodiak, Matanuska-Susitna, Seward, Valdez-Chitina-Whitter)

Anchorage (Anchorage)

Interior (Upper Yukon, Yukon-Koyokuk)

Fairbanks (Fairbanks, Southeast Fairbanks)

Sources:

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3.1.3 Impact on Alaska's Economy of the Northwest Pipeline to 1990

3.1.3.1 Assumptions and Methodology Used for Economic Impact Study

The MAP models show rapid economic growth in Alaska between 1978 (the first year of gas pipeline construction) and 1990. Therefore, the impact of the gas pipeline on the Alaskan economy will be to increase this growth rate somewhat, while changing the regional distribution of growth toward the three major impacted regions--Interior, Fairbanks, and Anchorage. In order to test the difference the gas pipeline makes in the MAP model results, the middle development scenario was selected and modified to reflect the higher level of petroleum sector (mining) and construction sector employment directly created by the pipeline project, and to show the greater level of petroleum revenues which would accrue to the state at current property tax rates, production tax rates, and royalty rates. The effect of these additions was traced through the model, and the impact of the changes measured as differences from the case in which no gas pipeline is built, including changes in gross product, employment (direct and indirect), wages and salaries, personal income, and state and local revenues and expenditures. These impacts were measured using the middle (Accelerated Development) case, but the absolute size of the impacts would be approximately the same regardless of the base used. The only difference would be in the relative importance of the impact, which would obviously be greater, the lower the economic baseline against which it is applied. This abstracts somewhat from reality, since the absolute size of the baseline economy may matter because of economies of scale; however, the differences are probably of second order importance when compared to other factors which cannot be accurately predicted, such as the price of gas.

The project contemplated in this report would begin in 1978, and would be operational in January, 1981, with two pump stations at a level of one billion cubic feet per day. Twelve more pump stations would be completed over the following three years, bringing average daily production to an assumed level of 2.25 billion cubic feet of gas per day by January, 1984. With about 10-15 persons employed in operations and maintenance per pump station, long-term direct operations and maintenance employment is expected to be 190 persons. Employment in construction is assumed to be at the levels projected in Table 3.1.3.1.

Since the wellhead price of gas is uncertain, three alternative prices were selected for different runs of the MAP model to indicate the range of the size of effects which could be expected. The minimum wellhead price of 50 cents is often used to suggest the approximate lower bound for a price of gas in Prudhoe Bay, since it would require about that much per thousand cubic feet to convert and/or install the necessary collection lines and stations to make 2.25 bcf available to any pipeline. If delivery costs to Lower 48 markets average about

Table 3.1.3.1

Northwest Gas Pipeline Direct
Employment Assumptions Used[1]
In MAP Model

(Average Annual Project Workforce)

Year	Direct Construction Employment[2]			Direct Mining Employment[2]			Total Direct Employment
	Interior	Fairbanks	Subtotal	Interior	Fairbanks	Subtotal	
1978	1120	1120	2240	0	0	0	2240
1979	2645	2645	5290	0	0	0	5290
1980	2957	2958	5915	0	0	0	5915
1981	890	890	1780	15	15	30	1810
1982	935	935	1870	35	35	70	1940
1983	1215	1215	2430	65	65	130	2560
1984	0	0	0	95	95	190	190
1985	0	0	0	95	95	190	190
1986	0	0	0	95	95	190	190
1987	0	0	0	95	95	190	190
1988	0	0	0	95	95	190	190
1989	0	0	0	95	95	190	190
1990	0	0	0	95	95	190	190

[1]Employment data source: Gulf Interstate, Houston, Texas
[2]Average annual employment assumed to be divided evenly between Fairbanks and Interior regions

one dollar per mcf, then the wellhead price cannot rise much above $1.50 per mcf. This is because FEA predicts that markets for gas in the Lower 48 will disappear at prices above about $2.40 per mcf.

While the exact construction costs and taxable value of the pipe and pumping stations in place is not known, initial estimates of direct committed capital cost in Alaska are available, and these were used as a proxy for the eventual taxable property value in pipeline equipment. The direct revenues injected into Alaska's economy by the Alaska Highway gas pipeline are shown for the three different prices assumed above in Table 3.3.3.2.

The structure of the MAP models does not permit a neat division of impacts into a construction period and an operations and maintenance period. This is partly due to the fact that the construction activity directly gives rise to general economic growth which continues beyond the construction period. In addition, some state revenues are collected in the construction period, and the spending of these revenues also extends past the construction period of 1978-1983. Finally, the construction, operations and maintenance periods overlap (1981-1983), further confusing the effects. Consequently, the impacts are reported by year only. While the reader may wish to divide the projection period in his own mind at January 1, 1981 or at January 1, 1984, he should recognize that the growth impacts of a gas pipeline are essentally a continuing process.

Table 3.1.3.2
Annual Property Taxes, Production Taxes, and Royalties Receipts:
Northwest Gas Pipeline

Alaska Portion
(millions of dollars)

Year	Cumulative Capital Cost	Property Tax	Gas Production (106 Mcf per day)	Gas Production Taxes, Plus Royalt $.50 Per Mcf	$1.00 per Mcf	$1.50 per Mcf
1978	$ 546.395	$ 10.9	0	0	0	0
1979	1,531.663	30.6	0	0	0	0
1980	2,015.310	40.3	0	0	0	0
1981	2,211.135	44.2	1.00	$30.1	$60.2	$90.3
1982	2,277.990	45.6	1.50	45.2	90.3	135.5
1983	2,277.990	45.6	2.00	60.2	120.4	180.7
1984	2,277.990	45.6	2.25	67.8	135.5	203.3
1985	2,277.990	45.6	2.25	67.8	135.5	203.3
1986	2,277.990	45.6	2.25	67.8	135.5	203.3
1987	2,277.990	45.6	2.25	67.8	135.5	203.3
1989	2,277.990	45.6	2.25	67.8	135.5	203.3
1990	2,277.990	45.6	2.25	67.8	135.5	203.3

3.1.3.2 Economic Impacts

Impact on Gross Product

The impact of the gas pipeline on gross product reaches its peak during the construction phase in 1980, generating an additional $210 million (in 1958 dollars) statewide. Owing to the specification of the development scenarios, roughly three-quarters of this construction period impact occurs in the Fairbanks and Interior regions. (Table 3.1.3.3) Following completion of the project in 1983, the level of impact falls sharply in these two regions, and by 1990, the total impacts for these regions range from 40 percent of the total statewide impact, given $0.50 gas, down to 28 percent for the $1.50 case.

Impacts on the Anchorage region peak at a somewhat lower level in 1983, but also fall off much more slowly, so that by 1990 this region accounts for 45.6 percent of the total statewide impact for $0.50 gas and 54.2 percent for $1.50 gas. Interestingly, the impact analysis shows that the distribution of gross product impact between the three regions (and most particularly between Anchorage and the other two regions) is very sensitive to the price of gas. At higher gas prices, more of the gross product impact goes to the Anchorage region. This is undoubtedly a function of increased state revenues for higher priced gas, which are more likely to enter the state economy in the Anchorage region that in Fairbanks or in the Interior. It should also be pointed out that at all three prices of gas, these three regions in total accounted for a fairly constant share of the total gross product impact (roughly 84 percent in 1990).

An industry-by-industry impact simulation was performed for $1.00/mcf gas. (Tables 3.1.3.4, 3.1.3.5, 3.1.3.6, 3.1.3.7) In the Interior, gross product impact peaks in the early 1980's, then falls to zero. Additional gross product in Mining reaches $16 million by 1984 and remains constant throughout the forecast period. Impacts in the support sectors (Service, Trade, Transportation, etc.) tend to follow the construction boom and bust, leveling out in 1984 and remaining essentially constant through 1990. The additional impacts in the Fairbanks region follow the same pattern as those in the Interior. In fact, a strong case can be made that much of the support sector output and employment which are allocated to Interior will actually occur in the Fairbanks Region. For all sectors except Mining and Construction, it is probably useful to think of these regions as a combined total, though reported separately, here. By 1990, roughly half the impact is experienced by the mining sector, and half by the support sectors, state and local government, and construction for both Interior and Fairbanks regions.

In Anchorage, with the exception of small short-run bursts in 1980 and 1983, gross product impacts increase steadily for all industries

Table 3.1.3.3

IMPACT ON GROSS PRODUCT BY REGION
(Millions of 1958 Dollars)

PRICE = 50¢/mcf

	Anchorage	Interior	Fairbanks	Statewide
1978	10.663	25.221	19.913	56.788
1979	33.825	69.526	49.344	158.643
1980	53.408	85.636	58.49	210.082
1981	47.211	30.066	25.418	121.359
1982	42.006	43.611	27.454	128.742
1983	49.221	59.066	37.062	161.852
1984	43.418	18.394	19.018	98.758
1985	34.976	18.082	17.359	83.902
1986	32.798	18.182	17.018	80.004
1987	33.217	18.233	16.969	80.121
1988	35.097	18.471	17.135	82.562
1989	37.802	18.484	17.448	86.02
1990	41.365	18.492	17.863	90.605

PRICE = $1.00/mcf

	Anchorage	Interior	Fairbanks	Statewide
1978	10.663	25.221	19.913	56.788
1979	33.825	69.526	49.344	158.643
1980	53.408	85.636	58.49	210.082
1981	51.256	30.233	26.222	123.328
1982	49.433	43.988	28.905	141.648
1983	60.182	59.604	39.157	130.578
1984	56.956	18.772	21.54	120.992
1985	49.739	18.463	20.06	107.719
1986	48.476	18.565	19.822	104.93
1987	49.869	18.631	19.87	105.289
1988	53.002	18.893	20.158	110.32
1989	57.16	18.926	20.625	115.556
1990	62.603	18.959	21.229	122.66

PRICE = $1.50/mcf

	Anchorage	Interior	Fairbanks	Statewide
1978	10.663	25.221	19.913	56.788
1979	33.825	69.526	49.344	158.643
1980	53.408	85.636	58.49	210.082
1981	55.305	30.4	27.026	135.297
1982	56.891	44.366	30.361	154.59
1983	71.201	60.144	41.261	199.391
1984	70.579	19.152	24.075	143.352
1985	64.627	18.846	22.782	131.723
1986	64.297	18.951	22.647	130.062
1987	66.682	19.032	22.796	132.684
1988	71.093	19.32	23.207	138.352
1989	76.736	19.373	23.832	145.605
1990	84.024	19.432	24.63	155.004

Table 3.1.3.4

$1.00/Mcf: IMPACT ON GROSS PRODUCT, BY INDUSTRY: INTERIOR
(Millions of 1958 Dollars)

	Ag, Fish, Forest	Mining	Construction	Manufacturing
1978	0.	0.	8.854	0.
1979	0.	0.	20.91	0.
1980	0.	0.	23.377	0.
1981	0.	2.67	7.036	0.
1982	0.	6.1	7.392	0.
1983	0.	11.091	9.605	0.
1984	0.	16.006	0.	0.
1985	0.	16.087	0.	0.
1986	0.	16.302	0.	0.
1987	0.	16.302	0.	0.
1988	0.	16.411	0.	0.
1989	0.	16.336	0.	0.
1990	0.	16.245	0.	0.

	Transportation Communications Public Utilities	Finance	Services	Trade
1978	1.414	0.	12.193	2.741
1979	3.56	0.	37.335	7.592
1980	4.24	0.	48.396	9.343
1981	1.501	0.	15.561	3.019
1982	1.69	0.	24.305	4.114
1983	2.262	0.	30.928	5.293
1984	0.348	0.	1.577	0.352
1985	0.324	0.	1.336	0.311
1986	0.322	0.	1.27	0.3
1987	0.331	0.	1.23	0.31
1988	0.345	0.	1.452	0.33
1989	0.363	0.	1.525	0.343
1990	0.385	0.	1.605	0.358

	Government Total	Federal	State and Local	Region Total
1978	0.019	0.	0.019	25.221
1979	0.128	0.	0.128	69.526
1980	0.28	0.	0.28	85.636
1981	0.447	0.	0.447	30.233
1982	0.387	0.	0.387	43.988
1983	0.424	0.	0.424	59.604
1984	0.488	0.	0.488	18.772
1985	0.404	0.	0.404	18.463
1986	0.371	0.	0.371	18.565
1987	0.359	0.	0.359	18.631
1988	0.356	0.	0.356	18.893
1989	0.359	0.	0.359	18.926
1990	0.366	0.	0.366	18.959

Table 3.1.3.5

$1.00/Mcf: IMPACT ON GROSS PRODUCT, BY INDUSTRY: FAIRBANKS
(Millions of 1958 Dollars)

	Ag, Fish, Forest	Mining	Construction	Manufacturing
1978	0.	0.	8.994	0.
1979	0.	0.	21.16	0.
1980	0.	0.	23.605	0.
1981	0.	1.547	7.228	0.
1982	0.	3.632	7.548	0.
1983	0.	6.805	9.77	0.
1984	0.	10.028	0.232	0.
1985	0.	10.028	0.213	0.
1986	0.	10.191	0.207	0.
1987	0.	10.191	0.204	0.
1988	0.	10.191	0.201	0.
1989	0.	10.191	0.204	0.
1990	0.	10.191	0.209	0.

	Transporation Communications Public Utilities	Finance	Services	Trade
1978	4.092	1.668	1.311	3.746
1979	10.498	4.066	3.195	9.724
1980	12.801	4.805	3.776	11.96
1981	5.766	2.15	1.689	5.385
1982	6.039	2.146	1.687	5.73
1983	7.872	2.689	2.114	7.581
1984	3.354	1.132	0.89	3.225
1985	2.967	0.99	0.778	2.868
1986	2.887	0.948	0.745	2.81
1987	2.937	0.946	0.744	2.882
1988	3.059	0.966	0.76	3.03
1989	3.237	1.001	0.787	3.237
1990	3.46	1.047	0.824	3.493

	Government Total	Federal	State and Local	Region Total
1978	0.102	0.	0.102	19.913
1979	0.703	0.	0.703	49.344
1980	1.542	0.	1.542	58.49
1981	2.456	0.	2.456	26.222
1982	2.123	0.	2.123	28.905
1983	2.326	0.	2.326	39.157
1984	2.679	0.	2.679	21.54
1985	2.216	0.	2.216	20.06
1986	2.035	0.	2.035	19.822
1987	1.967	0.	1.967	19.87
1988	1.951	0.	1.951	20.158
1989	1.967	0.	1.967	20.625
1990	2.003	0.	2.003	21.229

Table 3.1.3.6

$1.00/Mcf: IMPACT ON GROSS PRODUCT, BY INDUSTRY: ANCHORAGE
(Millions of 1958 Dollars)

	Ag, Fish, Forest	Mining	Construction	Manufacturing
1978	0.	0.	0.241	0.
1979	0.	0.	0.857	0.
1980	0.	0.	1.456	0.
1981	0.	0.	1.673	0.
1982	0.	0.	1.529	0.
1983	0.	0.	1.773	0.
1984	0.	0.	1.828	0.
1985	0.	0.	1.579	0.
1986	0.	0.	1.514	0.
1987	0.	0.	1.529	0.
1988	0.	0.	1.591	0.
1989	0.	0.	1.682	0.
1990	0.	0.	1.808	0.

	Transportation Communications Public Utilities	Finance	Services	Trade
1978	3.763	1.143	0.809	4.457
1979	10.944	4.268	8.035	13.008
1980	16.08	7.607	5.432	19.069
1981	12.842	9.065	6.494	15.183
1982	12.725	8.758	6.304	14.924
1983	15.842	10.719	7.752	18.397
1984	13.457	11.464	8.316	15.324
1985	11.853	10.116	7.353	13.407
1986	11.658	9.974	7.267	13.074
1987	12.098	10.388	7.589	13.439
1988	12.987	11.181	8.193	14.265
1989	14.108	12.235	8.992	15.315
1990	15.558	13.607	10.029	16.677

	Government Total	Federal	State and Local	Region Total
1978	0.249	0.	0.249	10.663
1979	1.714	0.	1.714	33.825
1980	3.763	0.	3.763	53.403
1981	5.993	0.	5.993	51.256
1982	5.192	0.	5.192	49.433
1983	5.698	0.	5.698	60.182
1984	6.568	0.	6.568	56.956
1985	5.433	0.	5.433	49.739
1986	4.99	0.	4.99	48.476
1987	4.824	0.	4.824	49.869
1988	4.786	0.	4.786	53.002
1989	4.828	0.	4.828	57.16
1990	4.923	0.	4.923	62.603

Table 3.1.3.7

$1.00/Mcf: IMPACT ON GROSS PRODUCT, BY INDUSTRY: STATE
(Millions of 1958 Dollars)

	Ag, Fish, Forest	Mining	Construction	Manufacturing
1978	0.	0.	18.164	0.
1979	0.	0.	43.438	0.
1980	0.	0.	49.587	0.
1981	0.	4.217	17.818	0.
1982	0.	9.733	18.164	0.
1983	0.	17.896	23.081	0.
1984	0.	26.034	4.364	0.
1985	0.	26.115	3.75	0.
1986	0.	26.492	3.578	0.
1987	0.	26.492	3.586	0.
1988	0.	26.602	3.69	0.
1989	0.	26.527	3.866	0.
1990	0.	26.436	4.103	0.

	Transportation Communications Public Utilities	Finance	Services	Trade
1978	9.616	2.855	14.373	11.059
1979	26.533	8.63	48.972	31.114
1980	35.931	13.045	58.504	42.14
1981	25.053	12.238	25.201	26.461
1982	26.04	11.807	33.585	27.316
1983	32.338	14.425	42.243	34.136
1984	23.021	13.823	12.504	22.283
1985	19.649	12.128	10.927	19.461
1986	18.985	11.906	10.665	18.896
1987	19.583	12.333	11.04	19.325
1988	20.847	13.188	11.811	20.369
1989	22.493	14.33	12.763	21.739
1990	24.606	15.811	13.989	23.507

	Government Total	Federal	State and Local	State Total
1978	0.72	0.	0.721	56.788
1979	4.955	0.	4.955	158.643
1980	10.879	0.	10.879	210.082
1981	17.335	0.	17.335	128.328
1982	15.001	0.	15.001	141.648
1983	16.457	0.	16.457	180.578
1984	18.966	0.	18.966	120.992
1985	15.687	0.	15.687	107.719
1986	14.408	0.	14.408	104.93
1987	13.927	0.	13.927	106.289
1988	13.818	0.	13.818	110.32
1989	13.937	0.	13.937	115.656
1990	14.211	0.	14.211	122.66

except agriculture, fisheries, forestry, and manufacturing, throughout the forecast period. The support sectors (transportation, finance, services, and trade) account for the major portion of the additional gross product impact.

Impact on Employment

Employment yields a slightly different view of the impacts caused by the gas pipeline, owing to the differences in capital intensity between economic sectors. That is to say, the labor requirement for a given level of gross product are far lower for the mining sector than for the support sectors. (Table 3.1.3.8)

Statewide, the impact on employment peaks in 1980 when an additional 20,278 jobs are created with the envisioned scenario indicating 13,000 jobs in the Fairbanks and Interior regions. With the completion of the project in 1983, employment impact falls dramatically and grows slowly for the remainder of the forecast period. In the Anchorage region, additional impact grows slowly throughout the period with a minor boom and decline during construction period.

In contrast to the impact on gross product, the regional distribution of impact on employment is far less sensitive to changes in the price of gas. Comparison of 1990 forecasts suggests that the Anchorage share of total employment impact remained roughly constant at about 58 percent.

Owing to the Interior region's reliance on employment in the mining sector, a sector with a low labor output ration, its share of the total employment impact was half of what its gross product share was. Construction employment impacted during the development phase of the pipeline shows no additional impacts following completion of the project in the Interior region. Following initial impact, additional employment in the support sectors and government (whether actually in Interior or Fairbanks) fall dramatically and grows very slowly to 1990. (Table 3.1.3.9) The discussion of employment impact on Interior in general holds true for the Fairbanks region although the impacts on the support and government sectors do not decrease as dramatically following the completion of the project. (Table 3.1.3.10)

The employment impact in the Anchorage region is far more stable than in the other two, and ranges between 5,000 in 1980 and 6,880 in 1990 with general growth through the forecast period. The support and government sectors once again account for the major portion of the employment impact. (Table s 3.1.3.11, 3.1.3.12)

Impact on Real Wages and Salaries

Wages and salaries impact in general follows the same pattern as employment impact. (Table 3.1.3.13) Statewide, payroll impact peaks

Table 3.1.3.8

IMPACT ON EMPLOYMENT BY REGION
(Thousands of Wage Earners)

PRICE = 50¢/mcf

	Anchorage	Interior	Fairbanks	State
1978	0.79	2.29	2.055	5.289
1979	2.866	5.903	5.062	14.87
1980	4.964	6.999	6.036	20.278
1981	5.263	2.293	2.687	13.548
1982	4.491	2.785	2.579	12.449
1983	5.088	3.591	3.18	14.562
1984	5.047	0.335	1.191	9.684
1985	4.014	0.292	0.961	7.645
1986	3.719	0.278	0.88	6.991
1987	3.726	0.278	0.856	6.89
1988	3.894	0.284	0.857	7.06
1989	4.159	0.289	0.874	7.384
1990	4.516	0.295	0.901	7.84

PRICE = $1.00/mcf

	Anchorage	Interior	Fairbanks	State
1978	0.79	2.29	2.055	5.289
1979	2.866	5.903	5.062	14.87
1980	4.964	6.999	6.036	20.278
1981	5.757	2.312	2.798	14.519
1982	5.385	2.822	2.773	14.183
1983	6.39	3.643	3.452	17.035
1984	6.645	0.385	1.516	12.661
1985	5.744	0.344	1.302	10.82
1986	5.538	0.33	1.227	10.275
1987	5.637	0.33	1.208	10.232
1988	5.926	0.338	1.215	10.595
1989	6.336	0.344	1.241	11.101
1990	6.883	0.353	1.281	11.795

PRICE = $1.50/mcf

	Anchorage	Interior	Fairbanks	State
1978	0.79	2.29	2.055	5.289
1979	2.866	5.903	5.062	14.87
1980	4.4.964	6.999	6.036	20.278
1981	6.251	2.331	2.91	15.491
1982	6.283	2.859	2.968	15.922
1983	7.693	3.595	3.724	19.517
1984	8.253	0.435	1.841	15.652
1985	7.487	0.395	1.646	14.015
1986	7.372	0.382	1.576	13.582
1987	7.566	0.383	1.562	13.701
1988	7.977	0.392	1.576	14.162
1989	8.536	0.4	1.612	14.851
1990	9.269	0.411	1.664	15.782

Table 3.1.3.9

$1.00/Mcf: IMPACT ON EMPLOYMENT, BY INDUSTRY: INTERIOR
(Thousands of Wage Earners)

	Ag, Fish, Forest	Mining	Construction	Manufacturing
1978	0.	0.	1.12	0.
1979	0.	0.	2.645	0.
1980	0.	0.	2.957	0.
1981	0.	0.015	0.89	0.
1982	0.	0.035	0.935	0.
1983	0.	0.065	1.215	0.
1984	0.	0.095	0.	0.
1985	0.	0.095	0.	0.
1986	0.	0.095	0.	0.
1987	0.	0.095	0.	0.
1988	0.	0.095	0.	0.
1989	0.	0.095	0.	0.
1990	0.	0.095	0.	0.

	Transportation Communications Public Utilities	Finance	Services	Trade
1978	0.017	0.	0.639	0.509
1979	0.04	0.	1.753	1.43
1980	0.045	0.	2.146	1.772
1981	0.015	0.	0.693	0.572
1982	0.015	0.	0.932	0.795
1983	0.02	0.	1.201	1.021
1984	0.003	0.	0.082	0.065
1985	0.003	0.	0.073	0.058
1986	0.003	0.	0.07	0.055
1987	0.003	0.	0.072	0.057
1988	0.003	0.	0.077	0.061
1989	0.003	0.	0.08	0.064
1990	0.003	0.	0.083	0.067

	Government Total	Federal	State and Local	Self Employed	Region Total
1978	0.005	0.	0.005	0.	2.29
1979	0.036	0.	0.036	0.	5.903
1980	0.079	0.	0.079	0.	6.999
1981	0.126	0.	0.126	0.	2.312
1982	0.109	0.	0.109	0.	2.822
1983	0.12	0.	0.12	0.	3.643
1984	0.139	0.	0.139	0.	0.385
1985	0.115	0.	0.115	0.	0.344
1986	0.106	0.	0.106	0.	0.33
1987	0.102	0.	0.102	0.	0.33
1988	0.102	0.	0.102	0.	0.332
1989	0.102	0.	0.102	0.	0.344
1990	0.105	0.	0.105	0.	0.353

Table 3.1.3.10

$1.00/Mcf: IMPACT ON EMPLOYMENT, BY INDUSTRY: FAIRBANKS
(Thousands of Wage Earners)

	Ag, Fish, Forest	Mining	Construction	Manufacturing
1978	0.	0.	1.16	0.
1979	0.	0.	2.736	0.
1980	0.	0.	3.069	0.
1981	0.	0.015	0.941	0.
1982	0.	0.035	0.984	0.
1983	0.	0.065	1.275	0.
1984	0.	0.095	0.032	0.
1985	0.	0.095	0.029	0.
1986	0.	0.095	0.029	0.
1987	0.	0.095	0.028	0.
1988	0.	0.095	0.028	0.
1989	0.	0.095	0.028	0.
1990	0.	0.095	0.029	0.

	Transportation Communications Public Utilities	Finance	Services	Trade
1978	0.156	0.072	0.248	0.275
1979	0.393	0.177	0.609	0.675
1980	0.474	0.211	0.724	0.802
1981	0.213	0.094	0.324	0.36
1982	0.219	0.095	0.326	0.362
1983	0.282	0.12	0.411	0.457
1984	0.119	0.051	0.173	0.193
1985	0.105	0.045	0.152	0.169
1986	0.102	0.043	0.146	0.163
1987	0.103	0.043	0.146	0.163
1988	0.107	0.044	0.15	0.167
1989	0.112	0.046	0.155	0.174
1990	0.119	0.048	0.163	0.183

	Government Total	Federal	State and Local	Self Employed	Region Total
1978	0.029	0.	0.029	0.115	2.055
1979	0.201	0.	0.201	0.272	5.062
1980	0.442	0.	0.442	0.315	6.036
1981	0.705	0.	0.705	0.146	2.798
1982	0.612	0.	0.612	0.139	2.773
1983	0.674	0.	0.674	0.167	3.452
1984	0.778	0.	0.778	0.073	1.516
1985	0.644	0.	0.644	0.063	1.302
1986	0.592	0.	0.592	0.059	1.227
1987	0.572	0.	0.572	0.057	1.208
1988	0.568	0.	0.568	0.057	1.215
1989	0.573	0.	0.573	0.057	1.241
1990	0.585	0.	0.585	0.058	1.281

Table 3.1.3.11

$1.00/Mcf: IMPACT ON EMPLOYMENT, BY INDUSTRY: ANCHORAGE
(Thousands of Wage Earners)

	Ag, Fish, Forest	Mining	Construction	Manufacturing
1978	0.	0.	0.035	0.
1979	0.	0.	0.126	0.
1980	0.	0.	0.216	0.
1981	0.	0.	0.249	0.
1982	0.	0.	0.23	0.
1983	0.	0.	0.268	0.
1984	0.	0.	0.278	0.
1985	0.	0.	0.241	0.
1986	0.	0.	0.232	0.
1987	0.	0.	0.235	0.
1988	0.	0.	0.246	0.
1989	0.	0.	0.262	0.
1990	0.	0.	0.283	0.

	Transportation Communications Public Utilities	Finance	Services	Trade
1978	0.153	0.045	0.161	0.256
1979	0.433	0.169	0.612	0.799
1980	0.615	0.303	1.107	1.241
1981	0.455	0.363	1.334	1.178
1982	0.444	0.354	1.317	1.13
1983	0.543	0.436	1.633	1.369
1984	0.425	0.469	1.767	1.299
1985	0.37	0.415	1.57	1.138
1986	0.359	0.411	1.562	1.11
1987	0.366	0.43	1.642	1.142
1988	0.385	0.465	1.787	1.211
1989	0.408	0.512	1.976	1.305
1990	0.44	0.572	2.221	1.428

	Government Total	Federal	State and Local	Self Employed	Region Total
1978	0.07	0.	0.07	0.069	0.79
1979	0.482	0.	0.482	0.247	2.866
1980	1.061	0.	1.061	0.421	4.964
1981	1.692	0.	1.692	0.484	5.757
1982	1.47	0.	1.47	0.447	5.385
1983	1.618	0.	1.618	0.523	6.39
1984	1.868	0.	1.868	0.539	6.645
1985	1.546	0.	1.546	0.464	5.744
1986	1.42	0.	1.42	0.444	5.538
1987	1.373	0.	1.373	0.449	5.637
1988	1.363	0.	1.363	0.468	5.926
1989	1.376	0.	1.376	0.497	6.336
1990	1.404	0.	1.404	0.535	6.883

Table 3.1.3.12

$1.00/Mcf: IMPACT ON EMPLOYMENT, BY INDUSTRY: STATE
(Thousands of Wage Earners)

	Ag, Fish, Forest	Mining	Construction	Manufacturing
1978	0.	0.	2.326	0.
1979	0.	0.	5.579	0.
1980	0.	0.	6.403	0.
1981	0.	0.03	2.347	0.
1982	0.	0.07	2.39	0.
1983	0.	0.13	3.035	0.
1984	0.	0.19	0.641	0.
1985	0.	0.19	0.551	0.
1986	0.	0.19	0.528	0.
1987	0.	0.19	0.531	0.
1988	0.	0.19	0.549	0.
1989	0.	0.19	0.577	0.
1990	0.	0.19	0.615	0.

	Transportation Communications Public Utilities	Finance	Services	Trade
1978	0.334	0.119	1.062	1.054
1979	0.899	0.358	3.066	2.99
1980	1.195	0.541	4.185	4.01
1981	0.776	0.501	2.695	2.425
1982	0.769	0.488	2.88	2.564
1983	0.946	0.601	3.6	3.155
1984	0.651	0.573	2.443	1.919
1985	0.562	0.504	2.152	1.672
1986	0.541	0.497	2.116	1.617
1987	0.549	0.516	2.198	1.648
1988	0.574	0.555	2.358	1.73
1989	0.607	0.605	2.572	1.843
1990	0.65	0.671	2.848	1.99

	Government Total	Federal	State and Local	Self Employed	State Total
1978	0.202	0.	0.202	0.193	5.289
1979	1.395	0.	1.395	0.582	14.87
1980	3.073	0.	3.073	0.872	20.278
1981	4.903	0.	4.903	0.842	14.519
1982	4.258	0.	4.258	0.765	14.183
1983	4.686	0.	4.686	0.882	17.035
1984	5.412	0.	5.412	0.834	12.661
1985	4.478	0.	4.478	0.711	10.82
1986	4.114	0.	4.114	0.674	10.275
1987	3.979	0.	3.979	0.672	10.282
1988	3.949	0.	3.949	0.69	10.596
1989	3.986	0.	3.986	0.72	11.101
1990	4.067	0.	4.067	0.743	11.795

Table 3.1.3.13

IMPACT ON REAL WAGES AND SALARIES PAID, BY REGION
(Millions of 1967 Dollars)

PRICE = 50¢/mcf

	Anchorage	Interior	Fairbanks	State
1978	5.332	22.847	18.097	47.3
1979	19.542	56.311	44.583	127.44
1980	34.248	64.978	53.042	167.958
1981	36.816	20.742	22.879	103.654
1982	31.791	23.695	22.401	96.529
1983	36.43	30.921	28.044	115.241
1984	36.683	2.599	10.053	72.656
1985	29.558	2.384	8.277	58.39
1986	27.723	2.331	7.725	54.254
1987	28.103	2.357	7.654	54.25
1988	29.707	2.42	7.805	56.339
1989	32.074	2.483	8.102	59.694
1990	35.202	2.558	8.5	64.182

PRICE = $1.00/mcf

	Anchorage	Interior	Fairbanks	State
1978	5.332	22.847	18.097	47.3
1979	19.542	56.311	44.583	127.44
1980	34.248	64.978	53.042	167.958
1981	40.272	20.848	23.749	110.529
1982	38.133	23.902	23.958	109.
1983	45.771	31.216	30.27	133.325
1984	48.302	2.902	12.762	94.817
1985	42.294	2.703	11.187	82.399
1986	41.285	2.659	10.746	79.477
1987	42.53	2.696	10.776	80.698
1988	45.215	2.775	11.047	84.298
1989	48.874	2.855	11.495	89.49
1990	53.658	2.949	12.081	96.307

PRICE = $1.50/mcf

	Anchorage	Interior	Fairbanks	State
1978	5.332	22.847	18.097	47.3
1979	19.542	56.311	44.583	127.44
1980	34.248	64.978	53.042	167.958
1981	43.73	20.955	24.62	117.403
1982	44.497	24.103	25.519	121.511
1983	55.154	31.513	32.502	151.477
1984	59.985	3.207	15.481	117.091
1985	55.127	3.024	14.114	106.568
1986	54.955	2.99	13.785	104.878
1987	57.081	3.038	13.917	107.345
1988	60.869	3.132	14.312	112.487
1989	65.846	3.229	14.914	119.554
1990	72.268	3.344	15.69	128.695

in 1980, creating an additional $167 million in real wage and salary income in that year. Payroll impact in the Fairbanks and Interior regions peaks in 1980, falls dramatically in 1984, and then grows slowly through 1990. In the Anchorage region, total impact grows moderately through 1990. By 1990, the Anchorage region contains 55 percent of total statewide impact for all three gas prices.

As was the case for employment and gross product, Mining and Construction payroll are most directly affected in the Interior and Fairbanks, construction falling off dramatically with project completion and mining payroll impact remaining relatively constant. (Tables 3.1.3.14, 3.1.3.15) Fairbanks, in addition, has significant impacts in the support sectors and government. Anchorage experiences favorable impact in all sectors with the exception of agriculture, fisheries, forestry, and manufacturing. (Table s 3.1.3.16, 3.1.3.17) Here again, the support sectors and government absorb the largest portion of the wage and salary income impact. As was the case in employment, the price of gas appeared to have little effect on the regional impact distribution.

Population Impact

The impact of the gas pipeline, as demonstrated in the previous discussion, serves to increase payroll and gross product. This, in turn, has effects on personal income which the simulation model uses to estimate statewide immigration. The results (Table 3.1.3.18) of the gas line simulation indicate a statewide population impact in 1990 of 19,456 for $0.50 gas, 26,479 for $1.00 gas, and 33,547 for $1.50 gas. Scenario construction estimates a statewide peak population impact of 28,692 in 1980 for all cases. Thus by 1990, only in the $1.50 gas case is the impact greater than the construction boom peak.

Regional population impacts are related to regional employment; hence, the magnitude of impact will tend to follow the employment impacts. For Anchorage, this implies a peak population impact during the pipeline development phase of around 10,000 for all three cases, and a 1990 population impact of 10,692 for $0.50 gas, 14,724 for $1.00 gas, and 18,783 for $1.50 gas. The Interior impact amounts to a peak of 14,354 during the construction phase for all cases, and a 1990 population impact of 715 for $0.50 gas, 845 for $1.00 gas, and 978 for $1.50 gas. The Fairbanks impact amounts to a peak of 8,413 for the construction phase in all cases and a 1990 impact of 2,279 for $0.50 gas, 2991 for $1.00 gas, and 3,707 for $1.50 gas.

Table 3.1.3.14

$1.00/Mcf: IMPACT ON REAL WAGES AND SALARIES PAID, BY REGION: INTERIOR
(Millions of 1967 Dollars)

	Ag, Fish, Forest	Mining	Construction	Manufacturing
1978	0.	0.	40.618	0.
1979	0.	0.	99.638	0.
1980	0.	0.	115.693	0.
1981	0.	0.493	36.168	0.
1982	0.	1.21	39.463	0.
1983	0.	2.363	53.26	0.
1984	0.	3.632	0.	0.
1985	0.	3.819	0.	0.
1986	0.	4.016	0.	0.
1987	0.	4.223	0.	0.
1988	0.	4.44	0.	0.
1989	0.	4.669	0.	0.
1990	0.	4.909	0.	0.

	Transportation Communications Public Utilities	Finance	Services	Trade
1978	0.406	0.	8.119	3.759
1979	1.	0.	23.505	11.006
1980	1.195	0.	30.371	14.225
1981	0.434	0.	10.356	4.792
1982	0.461	0.	14.697	6.94
1983	0.647	0.	19.985	9.297
1984	0.116	0.	1.44	0.622
1985	0.115	0.	1.348	0.569
1986	0.119	0.	1.375	0.572
1987	0.126	0.	1.496	0.617
1988	0.135	0.	1.675	0.686
1989	0.146	0.	1.838	0.746
1990	0.16	0.	2.024	0.813

	Government Total	Federal	State and Local	Region Total
1978	0.068	0.	0.068	52.969
1979	0.498	0.	0.498	135.647
1980	1.17	0.	1.17	162.655
1981	1.991	0.	1.991	54.235
1982	1.843	0.	1.843	64.614
1983	2.162	0.	2.162	87.714
1984	2.662	0.	2.662	8.472
1985	2.349	0.	2.349	8.2
1986	2.301	0.	2.301	8.382
1987	2.372	0.	2.372	8.834
1988	2.51	0.	2.51	9.446
1989	2.701	0.	2.701	10.1
1990	2.938	0.	2.938	10.844

Table 3.1.3.15

$1.00/Mcf: IMPACT ON REAL WAGES AND SALARIES PAID, BY INDUSTRY: FAIRBANKS
(Millions of 1967 Dollars)

	Ag, Fish, Forest	Mining	Construction	Manufacturing
1978	0.	0.	30.244	0.
1979	0.	0.	74.097	0.
1980	0.	0.	86.311	0.
1981	0.	0.406	27.483	0.
1982	0.	0.996	29.861	0.
1983	0.	1.945	40.191	0.
1984	0.	2.99	1.053	0.
1985	0.	3.144	1.001	0.
1986	0.	3.306	1.007	0.
1987	0.	3.476	1.03	0.
1988	0.	3.655	1.057	0.
1989	0.	3.843	1.116	0.
1990	0.	4.041	1.187	0.

	Transportation Communications Public Utilities	Finance	Services	Trade
1978	3.213	1.014	3.299	3.626
1979	8.597	2.659	8.553	9.357
1980	11.007	3.368	10.723	11.665
1981	5.246	1.605	5.066	5.469
1982	5.74	1.724	5.381	5.785
1983	7.839	2.318	7.164	7.667
1984	3.526	1.04	3.185	3.394
1985	3.297	0.97	2.945	3.106
1986	3.386	0.992	2.984	3.125
1987	3.634	1.059	3.155	3.283
1988	3.991	1.155	3.41	3.526
1989	4.451	1.279	3.741	3.846
1990	5.014	1.431	4.145	4.237

	Government Total	Federal	State and Local	Region Total
1978	0.562	0.	0.562	41.957
1979	4.133	0.	4.133	107.396
1980	9.702	0.	9.702	132.776
1981	16.507	0.	16.507	61.782
1982	15.281	0.	15.281	64.766
1983	17.928	0.	17.928	85.053
1984	22.074	0.	22.074	37.252
1985	19.474	0.	19.474	33.937
1986	19.076	0.	19.076	33.875
1987	19.668	0.	19.668	35.304
1988	20.814	0.	20.814	37.608
1989	27.394	0.	27.394	40.67
1990	24.361	0.	24.361	44.417

Table 3.1.3.16

$1.00/Mcf: IMPACT ON REAL WAGES & SALARIES PAID,
BY INDUSTRY: ANCHORAGE
(Millions of 1967 Dollars)

	Ag, Fish, Forest	Mining	Construction	Manufacturing
1978	0.	0.	0.809	0.
1979	0.	0.	3.009	0.
1980	0.	0.	5.348	0.
1981	0.	0.	6.415	0.
1982	0.	0.	6.137	0.
1983	0.	0.	7.447	0.
1984	0.	0.	8.018	0.
1985	0.	0.	7.216	0.
1986	0.	0.	7.214	0.
1987	0.	0.	7.604	0.
1988	0.	0.	8.254	0.
1989	0.	0.	9.113	0.
1990	0.	0.	10.223	0.

	Transportation Communications Public Utilities	Finance	Services	Trade
1978	3.2	0.76	2.219	4.02
1979	9.578	3.042	8.877	12.605
1980	14.437	5.809	16.95	19.8
1981	11.326	7.406	21.567	18.26
1982	11.713	7.674	22.381	18.349
1983	15.208	10.073	29.419	23.248
1984	12.662	11.524	33.572	22.012
1985	11.706	10.854	31.481	20.104
1986	12.034	11.434	33.048	20.435
1987	13.024	12.728	36.694	21.892
1988	14.543	14.649	42.116	24.194
1989	16.401	17.138	49.167	27.121
1990	18.753	20.383	58.33	30.867

	Government Total	Federal	State and Local	Region Total
1978	1.354	0.	1.354	12.362
1979	9.961	0.	9.961	47.072
1980	23.387	0.	23.387	85.731
1981	39.79	0.	39.79	104.764
1982	36.833	0.	36.833	103.086
1983	43.215	0.	43.215	128.61
1984	53.209	0.	53.209	140.997
1985	46.942	0.	46.942	128.302
1986	45.981	0.	45.931	130.145
1987	47.408	0.	47.408	139.34
1988	50.171	0.	50.171	153.926
1989	53.979	0.	53.979	172.918
1990	58.72	0.	58.72	197.277

Table 3.1.3.17

$1.00/Mcf: IMPACT ON REAL WAGES AND SALARIES PAID, BY INDUSTRY: STATE
(Millions of 1967 Dollars)

	Ag, Fish, Forest	Mining	Construction	Manufacturing
1978	0.	0.	71.956	0.
1979	0.	0.	178.796	0.
1980	0.	0.	212.138	0.
1981	0.	0.899	78.263	0.
1982	0.	2.207	83.184	0.
1983	0.	4.309	110.095	0.
1984	0.	6.622	20.492	0.
1985	0.	6.963	18.289	0.
1986	0.	7.321	18.166	0.
1987	0.	7.699	18.987	0.
1988	0.	8.095	20.386	0.
1989	0.	8.511	22.259	0.
1990	0.	8.95	24.618	0.

	Transportation Communications Public Utilities	Finance	Services	Trade
1978	6.968	1.799	13.784	11.544
1979	19.797	5.881	42.005	33.955
1980	27.814	9.587	60.575	47.984
1981	18.828	9.714	41.376	32.288
1982	19.779	10.057	46.636	34.621
1983	25.903	13.179	61.609	44.636
1984	18.68	13.57	44.518	31.063
1985	17.17	12.718	41.445	28.253
1986	17.556	13.337	43.076	28.522
1987	18.929	14.765	47.307	30.325
1988	21.019	16.885	53.649	33.21
1989	23.612	19.622	61.848	36.882
1990	26.873	23.165	72.406	41.547

	Government Total	Federal	State and Local	State Total
1978	3.61	0.	3.61	109.662
1979	26.552	0.	26.552	306.987
1980	62.338	0.	62.338	420.437
1981	106.06	0.	106.06	287.527
1982	98.179	0.	98.179	294.664
1983	115.192	0.	115.192	374.625
1984	141.83	0.	141.83	276.781
1985	125.125	0.	125.125	249.961
1986	122.565	0.	122.565	250.539
1987	126.368	0.	126.368	284.337
1988	133.73	0.	133.73	286.973
1989	143.883	0.	143.883	316.821
1990	156.52	0.	156.519	354.078

Table 3.1.3.18

IMPACT ON POPULATION BY REGION
(Thousands of Persons)

PRICE = 50¢/mcf

	Anchorage	Interior	Fairbanks	State
1978	0.115	4.567	2.815	6.537
1979	1.705	11.976	6.893	19.458
1980	4.92	14.354	8.413	28.692
1981	8.449	4.76	4.355	23.28
1982	7.945	5.997	4.279	23.191
1983	8.886	7.617	5.154	26.708
1984	10.736	0.792	2.751	21.721
1985	9.734	0.723	2.486	19.473
1986	9.485	0.694	2.373	18.69
1987	9.545	0.693	2.316	18.497
1988	9.799	0.704	2.283	18.616
1989	10.175	0.709	2.273	18.936
1990	10.692	0.715	2.279	19.456

PRICE $1.00/mcf

	Anchorage	Interior	Fairbanks	State
1978	0.15	4.567	2.815	6.537
1979	1.705	11.976	6.893	19.458
1980	4.92	14.354	8.413	28.692
1981	9.03	4.778	4.496	24.48
1982	9.065	6.031	4.542	25.45
1983	10.586	7.676	5.536	30.084
1984	12.903	0.878	3.23	25.944
1985	12.207	0.819	3.018	24.225
1986	12.222	0.797	2.945	23.834
1987	12.552	0.803	2.922	24.079
1988	13.107	0.821	2.924	24.634
1989	13.815	0.832	2.95	25.424
1990	14.724	0.846	2.991	26.479

PRICE = $1.50/mcf

	Anchorage	Interior	Fairbanks	State
1978	0.115	4.567	2.815	6.537
1979	1.705	11.976	6.893	19.458
1980	4.92	14.354	8.413	28.692
1981	9.612	4.796	4.637	25.682
1982	10.188	6.065	4.805	27.714
1983	12.292	7.736	5.919	33.433
1984	15.082	0.965	3.71	30.183
1985	14.697	0.915	3.552	29.001
1986	14.98	0.901	3.519	29.066
1987	15.581	0.914	3.532	29.694
1988	16.441	0.939	3.568	30.69
1989	17.486	0.957	3.629	31.958
1990	18.783	0.978	3.707	33.547

Impact on Personal Income

Table 3.1.3.19 contains the results of the gas line simulation statewide impact on personal income, real personal income, and real personal per capita income for each of the three postulated gas prices. The trend in both personal income and real personal income impacts is essentially the same for each of the three assumed gas prices. That is, the impact is highest during the construction phase, peaking in 1980 and again in 1983, when additional impact ranges between $368.2 million and $483.9 million for personal income and $131 million and $172.2 million for real personal income, depending on the assumed gas price. The size of impact then declines slightly, after which it increases through 1990, when the impact ranges between $265.8 million and $532.9 million for personal income, and $72.3 million to $145.0 million for personal income, and $72.3 million to $145.0 million for real personal income.

The model projects a negative impact on real personal per capita income following the construction phase, which is more pronounced for $0.50 gas than for $1.50 gas. This curious impact is undoubtedly the result of several factors. First, high paying construction employment attracts in-migrants. Second, once the construction is completed, continued economic impacts are in the relatively lower paying support and government sectors. Hence, even though wages and salaries grow over the simulated time period (see Table 3.1.3.13), population increases caused by the gas pipeline causes wages and salaries per capita for the impact simulation to fall below the level in the base case following project completion, as more people compete for jobs in the growing support and government sectors.

It should be noted, however, that there are favorable impacts on per capita personal income during the construction phase. This impact peaks in 1980, when for all three assumed gas prices there is an increase of $141.80 per capita.

State and Local Government Revenues and Expenditures

The construction and operation of the proposed pipeline would have a substantial impact on state and local revenues and expenditures no matter which assumption is made concerning the price of gas at the wellhead. (Table 3.1.3.20). Under each assumption, the additions to annual state revenues rise to $93 million in 1980, of which $40.3 million, or about 43 percent, are provided directly by petroleum sector taxes and charges. The next largest component, at 17 percent, is the individual income tax, and a fairly substantial portion of the revenues collected under this and the corporate income tax will be paid by workers and businesses directly employed on the pipeline. Additional local revenues ($13 million of which are projected by the MAP model

Table 3.1.3.19

IMPACT ON PERSONAL INCOME AND PER CAPITA INCOME

	Personal Income (mil$)	Real Personal Income (mil$)	Real Personal Per Capita Income (mil$)
PRICE=50¢/MCF			
1978	126.2	54.4	63.3
	352.4	146.3	138.7
	481.4	192.3	141.8
	308.2	118.5	37.2
	297.4	110.0	14.7
	368.2	131.0	19.5
	240.9	82.5	-18.3
	201.0	66.3	-25.5
	193.8	61.5	-27.1
	201.1	61.4	-26.2
	216.7	63.7	-24.4
	238.3	67.3	-22.0
1990	265.8	72.3	-19.4
PRICE=$1.00/MCF			
1978	126.2	54.4	63.3
	352.4	146.3	138.7
	481.4	192.3	141.8
	349.0	134.2	47.1
	374.3	138.5	28.7
	483.9	172.2	36.5
	388.2	133.0	1.5
	366.8	120.9	-6.0
	374.6	118.8	-9.8
	397.9	121.5	-11.5
	432.6	127.1	-11.8
	477.1	134.8	-11.0
1990	532.9	145.0	-9.4

Table 3.1.3.19 (Con't)

IMPACT ON PERSONAL INCOME AND PER CAPITA INCOME

	Personal Income (mil$)	Real Personal Income (mil$)	Real Personal Per Capita Income (mil$)
PRICE=$1.50/MCF			
1973	126.2	54.4	63.3
	352.4	146.3	138.7
	481.4	192.3	141.8
	328.6	126.3	42.2
	335.8	124.2	21.2
	426.0	151.6	28.0
	314.4	107.7	-8.4
	283.6	93.5	-15.7
	283.9	90.1	-18.4
	299.2	91.3	-18.8
	324.2	95.2	-18.1
	357.1	100.9	-16.5
1990	398.9	108.5	-14.4

Table 3.1.3.20

IMPACT ON STATE AND LOCAL GOVERNMENT REVENUES AND EXPENDITURES
(Million of Dollars)

	Individual Income Tax	Corporate Income Tax	Sales and Gross Rec. Tax	Misc. Taxes & Crgs.	Petroleum Revenues	Total State Rev.	Total State Exp.	Total Local Rev.	Total Local Exp.	State & Local Expenditures (adj. for Rev. Sharing)
Price-50¢/Mcf										
1978	0.0	0.0	0.0	0.0	10.9	10.9	8.2	1.4	1.4	8.2
1979	5.5	1.2	1.9	5.0	30.6	48.6	41.0	25.7	25.5	59.8
1980	16.1	3.6	5.2	14.6	40.3	93.2	83.1	70.3	69.4	139.5
1981	22.9	5.2	7.0	20.5	74.3	150.1	131.5	104.4	102.7	214.0
1982	15.2	3.5	4.4	13.5	90.8	143.0	120.3	75.1	73.5	176.2
1983	15.4	3.6	4.2	13.6	105.8	160.6	134.2	80.0	77.8	193.0
1984	19.8	4.7	5.1	17.4	113.4	185.0	156.7	103.2	99.9	235.1
1985	13.1	3.2	3.3	11.6	113.4	165.3	136.9	73.8	71.3	189.7
1986	11.2	2.7	2.7	9.8	113.4	160.8	132.4	65.3	62.9	177.7
1987	11.0	2.7	2.6	9.6	113.4	162.4	134.1	65.8	63.2	179.7
1988	11.7	2.9	2.7	10.2	113.4	167.1	138.7	70.8	67.8	188.5
1989	13.0	3.3	2.9	11.3	113.4	173.7	145.3	78.8	75.2	202.0
1990	14.7	3.8	3.1	12.7	113.4	181.8	153.4	89.6	85.2	219.2
Price-$1.00/Mcf										
1978	0.0	0.0	0.0	0.0	10.9	10.9	8.2	1.4	1.4	8.2
1979	5.5	1.2	1.9	5.0	30.6	48.6	41.0	25.7	25.5	59.8
1980	16.1	3.6	5.2	14.6	40.3	93.2	83.1	70.3	69.4	139.5
1981	22.9	5.2	7.0	20.5	104.4	180.2	154.1	107.8	106.0	236.5
1982	16.2	3.7	4.7	14.4	135.9	191.9	157.9	84.5	82.7	217.5
1983	17.3	4.1	4.7	15.4	166.0	228.7	187.2	95.5	92.8	253.7
1984	22.9	5.5	5.9	20.2	181.1	265.5	220.2	124.9	120.9	310.9
1985	17.2	4.1	4.3	15.1	181.1	250.0	204.7	100.0	96.5	273.6
1986	15.8	3.8	3.9	13.8	181.1	248.6	203.3	94.5	91.0	267.3
1987	16.1	4.0	3.8	14.1	181.1	253.3	208.0	98.1	94.2	274.9
1988	17.5	4.3	4.0	15.2	181.1	261.3	216.0	106.7	102.1	290.2
1989	19.5	4.9	4.3	16.9	181.1	271.7	226.4	119.3	113.8	311.3
1990	22.0	5.6	4.7	19.0	181.1	284.2	238.9	135.6	128.9	337.8

Table 3.1.3.20 (Con't)

IMPACT ON STATE AND LOCAL GOVERNMENT REVENUES AND EXPENDITURES
(Million of Dollars)

	Individual Income Tax	Corporate Income Tax	Sales and Gross Rec. Tax	Misc. Taxes & Crgs.	Petroleum Revenues	Total State Rev.	Total State Exp.	Total Local Rev.	Total Local Exp.	State & Local Expenditures (adj. for Rev. Sharing)
Price-$1.50/Mcf										
1978	0.0	0.0	0.0	0.0	10.9	10.9	8.2	1.4	1.4	8.2
1979	5.5	1.2	1.9	5.0	30.6	48.6	41.0	25.7	25.5	59.8
1980	16.1	3.6	5.2	14.6	40.3	93.2	83.1	70.3	69.4	139.5
1981	22.9	5.2	7.0	20.5	134.5	210.3	176.6	111.2	109.4	259.0
1982	17.2	3.9	5.0	15.3	181.1	240.9	195.7	93.9	91.8	258.9
1983	19.4	4.5	5.2	17.1	226.3	296.9	240.4	110.9	107.9	314.4
1984	26.0	6.2	6.7	22.9	248.9	346.1	283.9	146.7	141.9	386.9
1985	21.2	5.1	5.3	18.7	248.9	334.9	272.7	126.3	121.9	357.9
1986	20.4	5.0	5.0	17.9	248.9	336.7	274.4	123.9	119.3	357.4
1987	21.3	5.2	5.1	18.6	248.9	344.5	282.2	130.6	125.4	370.7
1988	23.3	5.8	5.3	20.2	248.9	355.8	293.6	142.9	136.8	392.5
1989	26.0	6.6	5.7	22.5	248.9	370.1	309.8	160.2	152.8	421.4
1990	29.5	7.6	6.2	25.4	248.9	387.0	324.8	182.2	173.2	457.2

to be shared revenue from the state) will amount to $70.3 million in each case, and additional state and local expenditures, adjusted for revenue sharing, amount to almost $140 million per year by 1980.

In 1981, the gas begins to flow, and the three cases diverge. State revenues peak twice -- once in 1984 and once in 1990, with total impact in that year ranging from $185 million with 50 cent gas, to $346 million with $1.50 gas. Thereafter, total state revenues impacts decline briefly because of the end of construction activity, but then the growth of the state economy in response to government spending takes over, and steady growth in revenues continues to 1990, with revenues impacts ranging from $182 million in the $ .50 case to $387 million in the $1.50 case. Total local revenues impacts follow a similar pattern, but peak three times -- 1981, 1984, and 1990.

The additional state revenues in the peak year of 1984 are mainly from direct taxes and royalties on the gas industry. These range from 61 percent of the total (contrasted with 43 percent in the construction year 1980) for the price of $ .50/Mcf, to 72 percent (contrasted with 43 percent) in the case of $1.50/Mcf. The next largest component is again the individual income tax, with impacts ranging from 11 percent with 50 cent gas down to 7.5 percent with $1.50 gas, and miscellaneous taxes and charges are a close third. By 1990, petroleum sector (gas) revenues have declined in relative importance in the $1.00 and $1.50/Mcf cases, but in all cases this direct source still provides well over half of all state revenue additions.

Impacts on expenditures tend to follow the pattern established by revenues in both the case of the state government and in the case of the local government. There is a peak in combined additional spending during the first production year (made possible by production revenues) of between $214 and $259 million. When the line is fully operational and up to maximum capacity in 1984, the additional revenues make possible additional combined expenditures of between $235 and $386 million. With the end of the construction boom, spending tails off, but the impact by 1990 in response to longer term growth still ranges from $219 million to $457 million.

In per capita terms, the impacts on state and local revenues and expenditures are not nearly as impressive. Referring to the key turning point years of 1981, 1984, and 1990 in Table 3.1.3.20, another table has been constructed (Table 3.1.3.21) which shows state revenues and state and local expenditures in per capita and real (1967 dollar) per capita terms for these years. After the initial construction period, which shows reduced per capita revenues and expenditures because of rapid increases in State population associated with pipeline construction impact, the impact on both state revenues and expenditures is positive, but minimal. In real terms, the largest measured impact on state revenue is only 79 dollars per person in 1984. Population increases, in response to increased personal incomes in Alaska and increases in employment

Table 3.1.3.21

IMPACT ON PER CAPITA AND REAL PER CAPITA REVENUES
AND EXPENDITURES OF STATE AND LOCAL GOVERNMENTS

	Per Capita State Revenues (DOLLARS)	Real Per Capita State Revenues (1967 DOLLARS)	Per Capita State Expenditures (DOLLARS)	Real Per Capita State Expenditures (1967 DOLLARS)	Per Capita State and Local Expenditures (DOLLARS)	Real Per Capita State and Local Expenditures (1967 DOLLARS)
PRICE=50¢/Mcf						
1978	-24.4	-10.4	-23.9	-10.3	-36.2	-15.6
1981	81.0	31.1	75.1	28.9	176.7	67.9
1984	73.9	25.3	62.5	21.4	124.2	42.5
1990	47.8	13.0	35.9	9.8	50.2	13.7
PRICE=50¢/Mcf						
1978	-24.4	-10.4	-23.9	-10.3	-36.2	-15.6
1981	124.9	48.0	106.9	41.1	205.8	79.1
1984	152.8	52.3	122.5	42.0	191.5	65.6
1990	107.5	29.2	83.5	22.7	113.8	30.9
PRICE=50¢/Mcf						
1978	-24.4	-10.4	-23.9	-10.3	-36.2	-15.6
1981	168.5	64.8	138.5	53.2	234.8	90.3
1984	230.8	79.1	181.9	62.3	258.1	88.4
1990	166.3	45.2	130.6	35.5	176.8	48.1

opportunities, reduce even this impact to 45 dollars in real terms by 1990. Much the same story can be told for state expenditures and for state and local combined expenditures. The direct construction period impact actually reduces the level of spending per capita; and while the state enjoys a brief increase in potential spending when gas begins to flow, the impact per capita is both small and short-lived.

Within those local communities directly impacted by the construction and operation of the pipeline, the revenue effect of pipeline construction would show considerable variation. The major staging area for construction would be Fairbanks, as it is for the trans-Alaska oil pipeline. Drawing on the recent experience of that community, one would project a significant increase in the value of property in the community as a result of both an increase in the stock of capital resources in the community and a demand generated increase in property values. For example, between 1974 and 1975, the estimated full value of property in Fairbanks City and the North Star Borough increased 40 percent. Receipts from the property and sales taxes increased sharply between 1974 and 1975. In both the city and the Borough, property tax revenues were up 33 percent and general sales tax revenues 53 percent. Expenditures in the city were up 13 percent and in the Borough 69 percent over the previous year. The large population influx associated with trans-Alaska pipeline related activities has had a significant impact on the ability of the community to provide both private and public services. Ability to respond is a function of the position of the community at the time of the impact. One would not expect the same relative impact on either revenues or expenditures from the proposed gas pipeline as the trans-Alaska oil pipeline, because of an increase in the supply of services now available which was a response to the construction of that pipeline.

In the North Slope Borough, the revenue impact of the construction of the gas line is more problematical. The line would pass within the boundary of the Borough for a significant distance and thus would come within its taxing jurisdiction. Since petroleum transportation facilities are presently taxed by the state government with transfers to local communities based upon a formula, the Borough could receive additional property taxes according to the guidelines of the formula at the time of pipeline installation. At present, the ceiling within which the local community must stay in collecting property tax from petroleum production and pipeline property can be calculated in two ways. It can be taxed so that the yield per capita from the total property tax does not exceed $1,000, or so that the yield is derived from a tax base which does not exceed the product of 225 percent of average per capita assessed value of property in the state and the number of residents in the taxing municipality. The formulae are generous to the local community and allow growth in the yield as the tax base grows. The stipulations of the formulae at any time are essentially

a political decision.

Requirements for services provided by local communities in the Borough would not increase commensurate with the potential increase in revenues. This is essentially the result of the nature of the work camps associated with the line and in all likelihood, the operations and maintenance thereafter. The camps are self-contained with services provided from Fairbanks and Anchorage. Construction and operation support facilities would, to a certain extent, be in place as a result of the trans-Alaska pipeline and additional infrastructure would be provided by a combination of private, state, and local interests.

The rural regions of the state along the proposed pipeline route would experience little direct revenue impact because of a thin tax base and little local government structure. The presence of the line within a region might serve as an incentive for a region to incorporate to take advantage of the tax base created by the pipeline itself. Requirements for the provision of human services would increase only slightly in the region north of Fairbanks, because of its sparse population. Since population density is higher along the portion of the route southeast of Fairbanks, the requirements for services would increase there somewhat more. Primarily these services would be provided by the state, because of a lack of local government structure. A major uncertainty at this time is the status of the haul road constructed by Alyeska Pipeline to supply their construction operations in the northern part of the state. Upon completion of the line, the state will take over the road and there is debate as to whether to open it to private vehicles for recreational and other uses. Were this done, demand on the road created by construction would add to demand created by recreational use. In the section southeast of Fairbanks, the existing road system would be employed during construction, greatly adding to required expenditures on maintenance.

Impacts on revenues and expenditures in Anchorage would be more generalized. The property tax base would rise as a direct result of pipeline construction support activities, but also as a result of increased state incomes generated by government spending at the state level. Requirements for the services provided by local government and the private sector would rise but against the background of general rapid growth of the Anchorage economy, the impact would be less than that created by the Alyeska pipeline.

Special Economic Impacts

There are three special topics in economic impacts which the preceding discussion does not address. These are the impact of gas pipeline development on the Native regional and village corporations, the impact of the pipeline on in-state gas use in Alaska, and the impact of the construction of the Canadian section of the line on the Alaskan economy. There is no formal model or analysis to guide these comments, so the

most that can be done is to identify the effects and give some notion as to their direction.

By the terms of the Alaska Native Claims Settlement Act, there were 12 regional corporations and one corporation for Alaska Natives living outside of Alaska. A specific system of payments was included in the Act by which the Federal and State governments agreed to buy out the Native aboriginal land claims. These payments are made to the corporations, which in turn required to redistribute part of the received funds to their individual stockholders and to the village corporations formed in their regions. Only about 10 percent goes directly to the Natives as individuals. The rest, about $63 million in each of the 1974, 1975, 1976 fiscal years, becomes the contributed capital of either the village or regional corporations.

Several of the corporations have been inclined to invest at least part of their money in pipeline or construction servicerelated businesses. For example, Cook Inlet Regional Corporation has participated in two joint venture contracts on the trans-Alaska oil pipeline. Ahtna supplies gravel to Aleyeska Pipeline Service Company, and has acquired a joint venture agreement with Rogers and Babler, a construction firm which January 1976. NANA Regional Corporation has four companies involved in TAPS: its Security Systems Division provided guards for the northern pipeline camps, NANA Oilfield services provides lodging and food at Deadhorse along with electricity and catering services, NANA Environmental Systems builds waste disposal facilities in the Arctic, and NANA Commercial Catering oeprates at the Ship Creek and Deadhorse Camps. Bering Straits Native Corporation owns an airline (Pacific Alaska), a trucking firm (Alaska Truck Transport), and Coastal Barge Lines, all capable of serving new development in Alaska. In addition, this corporation now owns Central Construction of Seattle, having previously worked with this firm to build a $14 million dollar highway from Skagway to the Canadian border. Doyon's joint venture with Alaska International Construction maintains the pipeline haul road north of the Yukon, and this corporation has expressed interest in other construction and mineral-related businesses. Finally, Arctic Slope Regional Corporation has been involved with National Mechanical on pipeline wrapping at Valdez and maintenance at Prudhoe Bay. Arctic Slope also wants to bid on schood construction in its region. Several corporations have thus demonstrated interest and capability to do pipeline-related or construction work.

If these corporations were to displace potential contracting firms from the Lower 48 in the proposed project, this would have the effect of reducing the leakage of profits and some other non-wage payments to the Lower 48, to the extent that the regional corporations reinvest a greater proportion of pipeline after-tax profits in Alaska than would Lower 48 contractors. If so, this would reduce the cost and enhance the availability of venture capital in Alaska, possibly increasing the growth rate above what the MAP model would predict. Also, to the extent the village and regional corporations are successful bidders and their ventures profitable, they would increase the wealth position of their

Native stockholders, who as a group have the lowest per capita incomes in Alaska.

The MAP model computer runs were based on the assumption that the entire 2.25 Bcf/day of gas would be exported from Alaska, since no consideration was given to in-state gas use in the Fairbanks area or elsewhere along the pipeline. There is potential for such gas use in Fairbanks in at least two ways. Space heating is an obvious use of gas in the Fairbanks vicinity, since most homes are currently heated with oil, wood, or electricity. Since 1973, the price of this shipped-in oil has increased dramatically, as has the cost of electricity, a large part of which has been generated with oil-fired gas turbines. With the completion of the TAPS pipeline and a small (30,000 b/d) refinery at North Pole, it is expected that the cost of heating fuels to the utilities and consumers will drop; however, gas could be made available as a substitute fuel. The impact on the Fairbanks economy and state economy of such a substitution in heating and electricity would have to the subject of a separate study.

Finally, the impacts shown on the Alaskan economy by the MAP model are those produced only by construction and maintenance of the Alaskan portion of the line, using the same basic staging areas as were used for the trans-Alaska oil pipeline. However, it may be possible for other Alaskan ports to be used as staging areas for Canadian section construction, e.g. Haines and Skagway. To the extent that Alaskan ports and staging areas are used to support the Canadian section, the MAP model will have understated the impact of the gas pipeline on the Alaska economy. To the extent that different ports and staging areas such as Haines and Skagway are used to support the pipeline in Alaska, there will be some regional re-distribution of effects within Alaska during construction, but the long-term statewide and regional impacts ought to be about the same as shown in the MAP model simulations.

3.1.3.3 Impact on the Human Environment (Social Effects)*

The social effects of the Alaska Highway gas pipeline would include changes at the individual, family, and community levels. Our discussion of these effects is based on a breakdown of communities into five categories:

A. Major support centers (Anchorage, Fairbanks)

B. Major staging areas (Fairbanks, Whitehorse)

C. Construction camp locations (Tok, Northway, Delta, and camps located north of Fairbanks)

D. Communities along the pipeline corridor and major supply corridors (approximately 11 small Native communities, 5 small non-Native communities)

E. Communities exporting labor (throughout Alaska)

Within each of the above categories the projected social effects would differ by community according to at least the following factors:

1. Extent of experience with the construction phase of the trans-Alaska oil pipeline and other major projects (e.g., OCS exploration, highways, defense).

2. Degree and success of community integration with a regional cash economy.

3. Presence of critical limitations to community growth, such as a lack of private land, potable water, employable local manpower, or highway links with the rest of the state.

4. Conflicts with other sectors at the community resource base, such as the tourist industry and subsistence activities.

*This section was originally prepared under the title "An Overview of the Social Effects Possible Under the Northwest Gas Pipeline Proposal", by John A. Kruse, ISEGR, for Gulf Interstate Corporation, June 10, 1976.

5. The timing and occupational characteristics of the manpower required for the sector of the gas pipeline in which a given community is located.

6. The extent to which construction activities are based within camps as opposed to nearby towns.

7. Community attitudes toward social change, including alterations in community size, the social characteristics of its resident population, and alteration in the social characteristics of a community's transient population.

8. Community attitudes towards planning.

We intend to discuss the social effects of the Northwest gas pipeline proposal in the context of the five community categories and eight key factors mentioned above. For a discussion of the alternative routes, we refer the reader to the report submitted to the Bureau of Land Management.[1] All qualifications contained in that report apply here as well.

Impacts on Major Support Centers

The Anchorage region clearly would provide the bulk of the required support services in Alaska. MAP projections indicate a continued high growth rate for the area, and one can expect continued bottlenecks in the expansion of community services. In addition, the scarcity of large lot, single family housing sites would continue to result in an escalation of land prices, an expansion into the agricultural and rural recreational areas in the Matanuska and Susitna Valleys, as well as a further shift to higher density housing.

The incidence of social impacts on the Anchorage population is difficult to project in view of its high turnover rate. Available data for Fairbanks, discussed below, suggest that long-term Anchorage residents are more likely to bear the brunt of social costs, not receive as many of the social and economic benefits, and to prefer the city as it was at an earlier time.

The relatively smooth growth pattern projected for Anchorage is not likely to be observed in Fairbanks due to its heavy dependence on construction employment. Although much of the employment generated by the oil pipeline construction activities is isolated within the construction camps, a substantial portion of the Fairbanks population (22 percent of the households) is currently employed by Alyeska or a subcontractor (see Table 3.1.3.22).[2] The high proportion of construction manpower among Fairbanks households can be seen in Table 3.1.3.23. Most of those working on the pipeline have been residing in the Fairbanks area three years or less (see Table 3.1.3.24) Not surprisingly, therefore,

Table 3.1.3.22

FAIRBANKS COMMUNITY SURVEY

PIPELINE COMPANY EMPLOYMENT
(percentage distribution)

	Percent
Presently working for pipeline company	22
Trying, interested, or possibly interested in becoming employed by pipeline company	24
Not employed by pipeline company and not interested	54
TOTAL	100
Number of respondents	265

Table 3.1.3.23

FAIRBANKS COMMUNITY SURVEY

OCCUPATION OF HEAD OF HOUSEHOLD
(percentage distribution)

	Percent
Professional-Technical	24
Managerial-Administrative	15
Sales	4
Clerical	6
Craftsman	23
Operatives	11
Transport	8
Laborers	3
Farm	0
Service	6
TOTAL	100
Number of respondents	257

Table 3.1.3.24

FAIRBANKS COMMUNITY SURVEY

LENGHT OF RESIDENCE BY PIPELINE COMPANY EMPLOYMENT
(percentage distribution)

Length of Residence	Working for Pipeline Co. Percent	Trying, Interested or Possibly Interested Percent	Not Employed or Interested Percent
Three years or less	69	45	35
Over three to ten years	12	33	16
Over ten years	19	22	49
TOTAL	100	100	100
Number of respondents	59	64	142

it is the newcomers that are primarily deriving the benefits of pipeline impact and the long-term residents who are bearing the costs (see Table 3.1.3.25).

In part, the negative impacts caused by rapid community growth would not be repeated during the construction of a gas pipeline. The construction boom recently experienced has resulted in significant capital investments in schools, telephone systems, utilities, and private housing stocks. Some support services, however, were transferred from local to absentee ownership, thus increasing the flow of money out of the community.

A further rise in the cost of living accompanied by shortages of manpower and supplies directed to pipeline construction activities can be expected during another construction boom. While incomes of Fairbanks households have risen over the period of pipeline construction (see Table 3.1.3.26), pipeline employees earn considerably higher salaries (see Table 3.1.3.27) with a resultant drain on manpower and loss in status of professional positions.

Since Fairbanks employment will follow a boom-bust pattern with regard to pipeline construction, post-construction social effects of the oil pipeline will, in large part, depend on the speed at which outmigration will occur. Table 3.1.3.28 indicates that a serious discrepancy may exist between occupational supply and demand. While a substantial 37 percent of those heads of households who are engaged in a professional-technical occupation distribution of Fairbanks residents presently holding pipeline jobs suggests a surplus of blue collar workers (see Table 3.1.3.29). Furthermore, 40 percent of those residents here three years or less have no plans to move from Fairbanks (see Table 3.1.3.30). A trans-Alaska gas pipeline route may mitigate a manpower surplus, at least temporarily, smoothing the changes in economic activity. A delay in gas pipeline construction might, however, aggravate the negative social impacts by delaying outmigration.

A gas line route passing near Fairbanks is currently favored by 70 percent of the adult population surveyed (see Table 3.1.3.31). This percentage varies by employment status with respect to the pipeline (see Table 3.1.3.32). Many local residents explain their support by saying that the negative impacts of construction have already occurred and it is now important to prevent a serious decline in economic activity.

The long-range social effects of the Northwest gas pipeline construction on the Fairbanks region are likely to include an economic downturn during the post-construction phase which will range in degree from somewhat less to much less than that projected for the period following the oil pipeline, depending on oil and gas activities in the Interior, North Slope, and Outer Continental Shelf.

Table 3.1.3.25

FAIRBANKS COMMUNITY SURVEY

LENGTH OF RESIDENCE BY RECEIVING OF BENEFITS OR BEARING COSTS
(percentage of distribution)

Length of Residence	Receiving Benefits Percent	Bearing Costs Percent	Neither or Both Percent
Three years or less	61	32	49
Over three to ten years	13	21	22
Over ten years	26	47	29
TOTAL	100	100	100
Number of respondents	67	121	77

Table 3.1.3.26

FAIRBANKS COMMUNITY SURVEY

INCOMES OF HOUSHOLDS
(percentage distribution)

Income (thousands of $)	Percent 1973	Percent 1974	Percent 1975	Percent 1976
Under 12,000	33	20	15	10
12,000-24,999	43	40	23	21
25,000-39,999	19	30	34	29
Over 39,999	5	10	28	40
TOTAL	100	100	100	100
Number of Respondents	246	253	260	238

Table 3.1.3.27

Fairbanks Community Survey

HOUSEHOLD INCOME BY PIPELINE COMPANY EMPLOYMENT
(percentage distribution)

Income (thousands of $)	Working for Pipeline Co. Percent	Trying, Interested or Possibly Interested Percent	Not Employed or Interested Percent
Under 12,000	3	19	17
12,000-24,999	3	22	31
25,000-39,999	35	38	32
Over 39,999	59	21	20
TOTAL	100	100	100
Number of respondents	58	63	136

Table 3.1.3.28

FAIRBANKS COMMUNITY SURVEY

OCCUPATION OF HEAD BY PLANS TO MOVE FROM FAIRBANKS
(percentage distribution)

Plans to Move Within	Prof-Tech Percent	Mgr-Sales-Cler-Serv Percent	Crafts-Operat-Trans-Laborers-Farm Percent
Next 6 mos.	21	9	12
Next 2 yrs.	16	16	9
In the future	21	19	22
No plans to move	42	56	57
TOTAL	100	100	100
Number of respondents	62	78	117

Table 3.1.3.29

FAIRBANKS COMMUNITY SURVEY

OCCUPATION OF HEAD BY PIPELINE EMPLOYMENT
(percentage distribution)

	Prof-Tech Percent	Mgr-Sales-Cler-Serv Percent	Crafts-Operat-Trans-Laborers-Farm Percent
Presently working for pipeline company	13	17	28
Trying, interested, or possibly interested in becoming employed by pipeline company	28	24	24
Not employed by pipeline company and not interested	59	59	48
TOTAL	100	100	100
Number of respondents	61	76	117

Table 3.1.3.30

FAIRBANKS COMMUNITY SURVEY

LENGTH OF RESIDENCE BY PLANS TO MOVE FROM FAIRBANKS
(percentage distribution)

	Length of Residence		
Plans to Move	3 Years or Less Percent	Over 3-10 Years Percent	Over 10 Years Percent
Within next 6 months	22	8	4
Within next 2 years	20	8	5
In the future	18	23	24
No plans to move	40	61	67
TOTAL	100	100	100
Number of respondents	120	52	96

Table 3.1.3.31

FAIRBANKS COMMUNITY SURVEY

ATTITUDE TOWARD A GAS PIPELINE PASSING NEAR FAIRBANKS
(percentage distribution)

	Percent
Strongly favor	36
Mildly favor	34
No opinion	8
Mildly oppose	12
Strongly oppose	10
TOTAL	100
Number of respondents	267

Table 3.1.3.32

FAIRBANKS COMMUNITY SURVEY

ATTITUDE OF A GAS PIPELINE PASSING NEAR FAIRBANKS

BY PIPELINE COMPANY EMPLOYMENT
(percentage distribution)

	Working for Pipeline Co. Percent	Trying, Interested or Possibly Interested Percent	Not Employed or Interested Percent
Strongly favor	52	33	29
Mildly favor	36	33	35
No opinion	7	11	7
Mildly oppose	3	9	18
Strongly oppose	2	14	11
TOTAL	100	100	100
Number of respondents	59	64	141

Major Staging Areas (Fairbanks, Whitehorse)

It is beyond the scope of this report to consider the social effects of the Alaska Highway gas route on Whitehorse. The Canadian portion of the proposed line would be handled as a separate operation. It would be difficult for job seekers from the Lower 48 to obtain employment through a Canadian union hiring out of Whitehorse. For this reason, transients can be expected to continue on to Fairbanks, the most probable hiring center.

We have previously given a brief overview of the social effects of a gas pipeline on Fairbanks in its role as a support center. Fairbanks is also the major staging area as plans call for pipe to be landed at Seward, transferred by rail to Fairbanks, double-jointed there, and distributed by truck. The distinction between support and staging activities is somewhat arbitrary since the support activities will primarily involve the management of construction. Operations management is likely to primarily occur in Anchorage.

The demands created by oil pipeline construction activities have resulted in heavy capital investments in warehousing, equipment, and service facilities. The high local construction employment generated overlapped with employment demands for the pipeline construction activities and may have resulted in an over-dependence on the construction sector. Since these facilities would be used for the construction phase of the gas pipeline, it is possible that construction employment will not peak (and later fall) to the degree observed for the oil pipeline. Alternatively, a shift in construction may occur whereby the management and service potential of the Fairbanks area may be realized. The latter would be risky not only because it would involve another local construction boom but also because it is less certain that a large management operation can continue to be supported in Fairbanks.

The employment picture is critical to an evaluation of the social effects of the proposed gas line on the Fairbanks area. Dramatic shifts in employment opportunities have set in motion a chain of effects ranging from the arrival of new families possessing no money, few skills, and little chance of obtaining housing on the one hand to the departure of long-term residents in the face of rising costs and a changing town where a stranger is more frequently seen than a friend. Other residents appear to have personally experienced few of these social effects. Research is now underway to assess the scope and distribution of social effects on the Fairbanks population.[3]

Major Camp Locations (Tok, Delta, Northway)

Construction camps north of Fairbanks are relatively isolated and will not directly effect existing communities. For this reason,

our discussion is directed to the existing camp at Delta and the proposed camps at Tok and Northway. Two Alyeska construction camps from south of Delta are to be moved to locations at Tok and Northway. Peak employment at each camp might reach 1,000-1,500 in the summer. The planned construction season would occur between March and late November. Civil work is planned to commence in March, 1978.

The communities of Tok, Delta, and Northway possess widely divergent social characteristics.[4] Tok is a small, primarily non-Native highway community service as a tourist stop and subregional commercial and service center. The Tok community has already experienced the effects of pipeline construction in the form of increased truck traffic, increased volume of transient job seekers, a lack of available local manpower, decreased tourist activity, housing shortages, as well as rising family incomes. The population of Tok has increased from 214 in 1970 to an estimated 450 in 1975.[5] In part, this population increase is due to construction and transportation workers who have decided to use Tok as a home base.

A construction camp located near Tok is likely to draw on the skills of residents in the blue-collar trades. Continued growth in permanent and transient populations may further erode the community potential for tourist trade and strain local services.

The community of Glennallen provides a useful comparative case in view of the oil pipeline construction camp located there and its similar size and highway orientation. Glennallen has experienced significant personal income gains, improvement of housing stock, and a growth in community infrastructure.[6] The ability of Glennallen to respond to growth pressures has been limited by a severe lack of private land and high construction consts. While private land holdings are plentiful in the Tok area (although much is onwed by non-residents), high construction costs may continue to result in a deficit in low to moderate cost housing.

Both Tok and Glennallen residents share a strong antipathy to government interference. Tok residents, however, appear more willing to provide community services for themselves and may be able to respond to growth pressures in that sector. Non-resident control of the local power utility, a scarcity of good water supplies, and a lack of solid waste disposal sites may become problems in the Tok area.

A recent opinion poll of Tok residents indicates a level of support among adult residents for a gas line corridor nearby that is similar to the support found in Fairbanks (70 percent).[7] There is some evidence, however, that there is less support among high school age youth in the Tok area. Both age groups rank a pipeline construction center as the least preferable alternative on which to establish a community economic base (the other alternatives being: tourism, federal

and state programs, resource development, regional supply and service center, transportation). The construction camp at Delta would continue to be used under the Northwest gas pipeline proposal. Delta has experienced similar effects to those outlined for Tok (truck traffic, transients, local manpower deficit, drop in tourist activity, housing shortages) due to its highway orientation. The effect of the construction camp itself has been not only to magnify the actual extent of change but also to generate local fears concerning the occurrence of problems. Such expectations have led to decreased use of local commercial facilities and an increase in confrontations between pipeline workers and local residents. The location of the camp at Delta has also led to an influx of families of pipeline workers.

In contrast to Tok, where many residents are engaged in construction trades, Delta residents are primarily oriented toward nearby Fort Greely. A large contingenty of retired military live in Delta and the community's economy has traditionally been dependent on the military base. Delta also has a comparatively successful farming community by Alaska standards and caters to the summer tourist trade. The farming community has benefitted from a demand for hay in connection with oil spills but has been hurt, as well, by an escalation of land prices and resultant subdivision of agricultural land. Land speculation, in general, is more salient in Delta than in Tok.

The community of Delta has not been able to successfully respond to a need to expand community services. An unstable political situation has resulted in deterioration of community services which would be intensified by continued use of the Delta construction camp.

The community of Northway, located on a side road about seven miles off the Alaska Highway, is populated by both Natives and non-Natives, the latter being primarily employed by the FAA and the local lodge and gas facilities.

The Native community suffers from a poor adjustment to high levels of western contact and is reported to have relatively high rates of alcoholism, broken homes, and welfare cases. The location of a large construction camp nearby is not likely to result in the relatively successful community response projected for Tok. Labor participation rates would be low and contacts between construction workers and village residents would probably aggravate existing social problems. Physical disruption and contact with transients in the village itself should be less than for those communities located on the Alaska Highway itself. The residents of Northway engage in subsistence activities but it is not known to what extent these activities would be disrupted by the construction of a gas line.

Communities Along the Proposed Pipeline Corridor

The communities along the pipeline corridor north of Fairbanks have already experienced some of the social effects of the oil pipeline.

Only Wiseman and Livengood are located near the pipeline and these communities would probably not be additionally changed by a gas pipeline. The major social effects for the remainder of the communities north of Fairbanks have been related to changes in employment opportunities for persons willing to leave their community. These communities can be thus more appropriately discussed under the heading of communities which export labor.

Present plans call for the pipeline to closely follow the highway between Delta and the border. Communities located close to the road (including Dot Lake and, to a lesser extent, Tanacross) are vulnerable to severe physical disruption. The extent of the social impacts range from the need to physically remove existing structures to the temporary inconveniences incurred by the movement of materials and equipment. A more precise estimate can only be made when the engineering for the route has been completed.

The communities of May Creek, Dot Lake, Tanacross, and Tetlin are located along the proposed corridor and have not been previously discussed. Proceeding southeast from Delta along the Alaska Highway, the first community is May Creek, a religious settlement of about 200 located somewhat off the main highway. Community residents wish to remain isolated and as self-sufficient as possible, growing their own food and fiber. The youth of the settlement have at times obtained employment outside the community and may take advantage of local employment opportunities provided by pipeline construction or fill jobs vacated by others. In view of the purpose for which May Creek was established, a major construction effort would require careful planning to avoid a serious disruption of the community.

Dot Lake is the next community to the southeast. It is reported to have a current population of 24 non-Natives, an increase of 60 percent over the 1970 population.[8] The Dot Lake Native community is active in the regional Native corporation, Doyon, and its non-profit counterpart, the Tanana Chiefs Conference. The community has been relatively successful in adapting to western cultural influences. Residents of Dot Lake work for the government, on road or other construction, and recently have been employed on the pipeline. Hunting and trapping activities occur in winter. Residents are likely to participate in employment opportunities provided by the gas pipeline.

The community of Tanacross is primarily Native, has shared in the exposure to western culture experienced by other highway communities, and has adjusted to such influences with a level of success intermediate to Dot Lake and Northway. Tanacross, as with other Native communities in the area, faces the challenge of mixing subsistence pursuits with rising material expectations. Seasonal trapping and carpentry, highway construction, and fire fighting work have, in part, met the increasing need and/or desire for a cash income. The construction of a gas pipeline

near the community would be likely to create a salient alternative source of seasonal employment. Acting against this incentive is the possible necessity of having to travel to Fairbanks to participate in the union call, or worse, being transferred to a construction camp away from home. In any case, Native participation in pipeline employment opportunities will largely depend on the existence of a policy to hire Natives coupled with a means to disseminate employment information and actively recruit Native manpower. The long-range effects of the pipeline should not be expected to include a stable economic base and, in most cases, it appears that job opportunities are correctly perceived as a temporary source of seasonal employment.

The final community to be discussed under the category of communities located along the proposed pipeline corridor is Tetlin. Presently unconnected by road to the state highway system, the residents of Tetlin have enjoyed the ability to better control the degree of contact with other cultures. This is not to say Tetlin residents have not sought employment outside the community. The lack of easy access not only limits unsolicited outside contact it also makes it expensive to leave the community to seek employment or to obtain food and fuel.[9]

Under optimum circumstances, a gas pipeline constructed along the Alaska Highway will provide employment opportunities for Tetlin residents without imposing unwelcome outside pressures on the community. Even under these conditions, the dependence on locally available subsistence resources may be jeopardized by construction activities, or more likely, increased use of the area by non-resident hunters. The latter pressure has already been reported.[10]

Communities Exporting Labor

The pattern of village participation in pipeline employment opportunities is at this point unclear. Residents of villages throughout Alaska have been employed on the pipeline but some villages have exported a substantially higher percentage of their manpower than others. Some of the factors which probably influence village participation are:

1. A village orientation toward seasonal jobs, particularly in construction.

2. Inexpensive, convenient transportation connections to hiring centers.

3. A village age/sex distribution weighted toward young males.

4. Saliency of the employment opportunities either by proximity to construction sites and/or an active dissemination of employment information.

5. An effective recruitment program by government agencies and Native organizations.

6. A lack of time conflicts between traditional local job and subsistence activities.

One prevalent hypothesis is that villages which have successfully adapted to non-Native contacts in the past are more likely to contribute manpower. This statement is, of course, nearly a tautology in the absence of a detailed discussion of the factors related to successful adaptation. Such an integrated perspective has yet to be prepared. It is significant to note, however, that villages currently suffering from a deterioration of traditional lifestyles and an inability to incorporate successful new lifestyles may not be helped by pipeline employment opportunities. These communities may continue to have high rates of alcoholism and accidental death and a heavy dependence on welfare while more successful communities take advantage of the additional employment opportunities.

Village Natives who do take pipeline jobs do not necessarily achieve a net gain in total well-being, either for themselves or for their village. The necessity of coming through Fairbanks or Anchorage on their way to and from a pipeline job poses a problem for those not acquainted with city life. If temporary housing cannot be found, the streets must be used and some spend their earnings before they ever reach home. Meanwhile, the village may experience a scarcity of local manpower and leadership, forcing women to take on heavy work and community projects to be postponed. There have been some reports that the discrepancy between pipeline and local wage rates has deterred village youth from working at all.

Since distance to the construction site is only one factor influencing village manpower participation, the projected social impacts for this category of communities should be proportional to the projected manpower demand and Native hire policies of each of the proposed routes.

Summary of Social Impacts

The discussion of social impacts presented in the previous section has focused on the community level. Such a perspective is necessary, given variations in community functions and characteristics. Which ever gas route becomes a reality, social impacts will be felt in a wide range of Alaskan communities. Employment opportunities and the redistribution of state revenues from gas production and transportation are two forces operating to diffuse impacts.

We have not dealt extensively with the social impact of changes in subsistence resource availability. While many communities have noted decreases in the availability of game, it is not clear whether natural migration changes, over-hunting, mismanagement, lack of time spent hunting, or actual effects of the pipeline are primary limiting factors. It is possible, however, that the development incentives provided by the pipeline would cause major disruptions to subsistence over the long term. Recreation hunting access, for example, has resulted

in competition for subsistence resources in the Copper River region.

Also of major concern are changes in the social desirability of subsistence activities, particularly among young people. Evidence of numerous changing attitudes are present in the remarks of many village elders. Village activities which depend on volunteer or low salary labor are rejected by teenagers who are well aware of the high paying jobs available. The construction of a gas line will aggravate the conflict between self-interest and village welfare.

The proposed pipeline route will become a salient force against traditional lifestyles in an expanded number of communities. While some communities may currently desire wage incomes, it is our observation that such attitudes may shift back and forth over time. The process of cultural change cannot be documented by an undimensional change in attitudes; rather, it is an interplay between adaptation and consolidation. The use of small villages as major supply depots would prevent the community from maintaining elements of its traditional lifestyle.

The optimum employment opportunity for a village resident with strong family ties and who depends on subsistence opportunities is one which is near home and is temporary. Adverse social impacts increase when employment is only available far away from home or is so near home that it is related to a decrease in subsistence opportunities and provides the only source of income. Obviously, no route can take such an alignment with respect to every Alaskan village.

Incoming population groups may not share the same cultural background of long-term residents, White or Native. Should the original village population become the minority, it is possible that new interest and activities will supplant old ones. In some cases this process may threaten efforts to preserve Native cultures. The unique lifestyles and perspectives held in small Alaskan communities represent a reservoir of diversity that massive population increases could overwhelm.

The social impacts of a gas pipeline cannot be predicted in detail without a substantial research effort involving communities likely to be affected. In addition, the presence or absence of a number of mitigating measures is also a prerequisite for assessment:

1. Will the builder provide funds for short-term dislocations that result from direct and induced activities?

2. Will the builder be required to consult with local communities with regard to local hire, the types or training that would become a long-term regional resource, and the local time and space requirements for all phases of living?

3. Will the community have continued access to the builder in order that unanticipated

impacts can be dealt with?

4. Will the builder be liable for long-term changes of a drastic nature, such as the loss of subsistence resources?

5. Will the builder be held to previous impact projections, such as for population increases?

These and other issues should be formally addressed in the environmental impact statement.

FOOTNOTES

[1]Kruse, John A. A Cursory Comparison of Social Impacts Alternative Gas Pipeline Routes from Prudhoe Bay, Alaska, Institute of Social, Economic, and Government Research, University of Alaska, December 23, 1975.

[2]The tables in Section 3.1.3.3 are based on a preliminary analysis of 268 interviews presently completed in a probability sample of 500 Fairbanks households. The results are subject to modification as the study is not yet complete. Kruse, J. A., Institute of Social, Economic, and Government Research, Spring, 1976.

[3]Kruse, J. A. and Kleinfeld, J.K., Institute of Social, Economic, and Government Research. A household survey based on a probability sample of 500 Fairbanks households was 60% complete as of June 6, 1976. Results will be reported in the fall of 1976.

[4]Alan Epps, University of Alaska Cooperative Extension Service provided much of the background information on the communities between Fairbanks and the Canadian border.

[5]Fairbanks Town and Village Association for Development, Inc., COMMUNITY FACILITIES SUMMARY, October, 1975.

[6]Institute of Social, Economic and Government Research, COPPER RIVER-WRANGELL MOUNTAINS REGION SOCIO-ECONOMIC PROFILE (working draft), March 30, 1976.

[7]Morgan, Ray and Epps, Alan, Cooperative Extension Service, University of Alaska, TOK, ALASKA OPINION POLL, May, 1976, mail questionnaire of 107 residents

[8]Fairbanks Town and Village Association, Op Cit.

[9]Fairbanks Town and Village Association for Development, Inc., Rural Pipeline Impact Information Program, REPORT ON QUESTIONNAIRE SURVEYS, June, 1975.

[10]Ibid.