EL PASO ALASKA COMPANY

# TRANS—ALASKA GAS PROJECT

# MID 1975

# SOCIOECONOMIC ANALYSIS

AUGUST 27, 1975

# TRANS-ALASKA GAS PROJECT: MID 1975 SOCIOECONOMIC ANALYSIS

## Executive Summary

El Paso Alaska Company has filed with the Federal Power Commission an Application for its Trans-Alaska Gas Project. The socioeconomic analysis included as part of the Environmental Report accompanying that Application was based upon information and data available in mid 1974. Now, in mid 1975, it is necessary to revise the earlier analyses and projections. This revision reflects, on the one hand, a significant change in the baseline conditions likely to occur in Alaska in 1977 when the Trans-Alaska Gas Project construction will begin; and on the other hand, it reflects a reduction in construction manpower requirements estimated by El Paso Alaska.

The revised baseline data represent more current and realistic projections of the impact of the Trans-Alaska Pipeline System (Alyeska) construction upon the population of Alaska. By 1977, the Alaskan population is now projected to be 473,000 compared with the 426,000 estimated a year ago. The maximum population growth increment which can be attributed to the Trans-Alaska Gas Project, however, has been reduced from 67,000 to 57,000. In all, the revised analysis given in this report reduces the growth stimulus projected earlier for the T-AGP, and now leads to projection of a relatively flat trend in population and employment. The overall effect is a substantial reduction, from earlier estimates, of the impacts attributable to the Trans-Alaska Gas Project on the Fairbanks and Cordova areas while those on the Anchorage area are projected to increase slightly.

In the analysis presented with El Paso Alaska's Application, it was projected that there would be a net public service cost impact to Alaska during the 1977-1981 construction period. The new analysis projects that state and local government finances will show a net positive cash balance of some $68 million over the construction period, and in 1982 and beyond (the operating period) annual net revenue should exceed $170 million.

In short, the revised analyses indicate that the El Paso Alaska project will contribute incremental impacts of less significance than originally estimated, and that changes induced by the Alyeska project will accommodate, in larger measure, further changes induced by the Trans-Alaska Gas Project.

This analysis provides additional evidence that the Trans-Alaska Gas Project will benefit both the State of Alaska and the nation as a whole. Alaska will benefit financially because revenues accruing to the state as a result of the project will exceed increased public service costs throughout the life of the project. El Paso Alaska stresses the utility and benefits of the gas transportation system it will provide, both to uses in the state, through making gas available to residents and business along the route, and to the nation as a whole, as it strives for energy independence.

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## 1.0 Introduction

In September 1974, El Paso Alaska Company filed with the Federal Power Commission an Application respecting the proposed Trans-Alaska Gas Project (T-AGP).[1/] The socioeconomic analysis incorporated in the Environmental Report of that Application was based upon data available in the summer of 1974. In particular, it utilized baseline conditions developed by the Alaskan Department of Labor[2/] and by Human Resources Planning Institute (HRPI).[3/]

Since that analysis was prepared, new information has become available which substantially alters the conclusions drawn in 1974. In November 1974 an updated report, "Manpower and Employment Impact of the Trans-Alaska [Oil] Pipeline," was produced by Human Resources Planning Institute (HRPI) and Urban and Rural Systems Associates (URSA) for the U.S. Department of Labor.[4/] In that study, the average annual level of construction manpower on the Trans-Alaska Oil Pipeline (Alyeska) project was increased by more than 50 percent from the level used in the original socioeconomic analysis of the Trans-Alaska Gas Project. Because of this significant change, it is now necessary to revise the baseline employment and population in 1977, the terminal year of the Alyeska project and the beginning year of construction on the Trans-Alaska Gas Project.

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1/ El Paso Alaska, "Application of El Paso Alaska Company At Docket No. CP75-96 for a Certificate of Public Convenience and Necessity," (September 24, 1975).

2/ Alaska Department of Labor, "Annual Population and Employment Projections, 1961-1980," (Juneau, March 1974).

3/ HRPI, "A Forecast of Industry and Occupational Employment in the State of Alaska," for the Man in the Arctic Program, Institute of Social, Economic and Government Research [ISEGR], University of Alaska, (Fairbanks, April 1974).

4/ HRPI/URSA, "Manpower and Employment Impact of the Trans-Alaska Pipeline," (Seattle, November 1974).

In addition, new data on T-AGP construction manpower requirements have become available which further necessitate revision of earlier socioeconomic projections and analyses. Specifically, the estimate of the number of construction workers required on the T-AGP was reduced, correcting an error, thereby lowering by 25 to 30 percent the manpower requirements. Moreover, a time-phased geographical distribution of both construction and operating manpower has been developed for the T-AGP.[5/] As a result, it is now possible to project more precisely the timing as well as the geographical incidence of socioeconomic impacts of the Trans-Alaska Gas Project. In El Paso Alaska's Application, socioeconomic impacts of the pipeline portion of the project were apportioned among three study areas (Arctic, Interior, and South Coastal) on the basis of the percentage of pipeline lying within each area. The new data show manpower requirements within specific Census Divisions in each study area.

The net effect of the changes in Alyeska and El Paso Alaska construction manpower requirements was to increase the projected socioeconomic impacts of the Alyeska project while decreasing - both absolutely and relatively - those of the Trans-Alaska Gas Project.

In particular, for example, the Alaskan baseline population in 1977 has been revised from 426,000 to 473,000. The maximum statewide increase attributable to the Trans-Alaska Gas Project has been reduced from 67,000 to 57,000 occurring in 1980. Without the T-AGP, total construction employment is presently projected to peak in 1976 and then decline substantially as Alyeska construction is completed. However, if required approvals are received according to the present schedule, the Trans-Alaska Gas Project will serve to ease that post-construction unemployment situation. In short, while the revised analysis reported here reduces the magnitude of the T-AGP growth stimulus projected earlier, it now leads to projection of a relatively flat trend in both population and employment.

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5/ El Paso Alaska Response (April 1975) to Federal Power Commission Staff Data Request, Letter to W. G. Henderson, (Feb. 7, 1975).

Projections of economic impacts also have been revised significantly. Whereas the increased public service costs attributable to T-AGP were initially projected to exceed the impact revenues during construction, state and local government finances are now projected to show a net positive cash balance both during the construction and the operating phases of the project. During the 1977-1981 construction period the net impact revenue is estimated to be over $68 million. After pipeline operations begin in 1982, annual net revenue is projected to exceed $170 million.

The objective of this report, then, is to revise the earlier El Paso Alaska socioeconomic analysis as presented in the Application and in the supplementary information presented in April 1975 in response to the FPC data requests. The report presents a comprehensive statement of El Paso Alaska's current socioeconomic analysis. In particular, the report addresses the substance of the FPC Data Requests Nos. 127, 130, and 144. The responses to those questions, which related to population growth, public service costs, and benefits accruing to the State of Alaska as a result of the T-AGP, are completely superceded by the analysis reported here.

The report is organized into four sections and three appendices. Section 2 presents revised estimates of overall, statewide socioeconomic impacts, focusing on the primary variables affected by the proposed action: population, employment, housing, and public services. Section 3 then presents revised estimates of the socioeconomic impacts on communities near the pipeline route and LNG plant. Of particular interest are the projected impacts upon the Cordova area which, because of reduced LNG plant and marine terminal construction manpower requirements, are expected to be less than those expressed in the Environmental Report of the El Paso Alaska Application. Section 4 concludes the body of the report with an overview evaluation of the projected socioeconomic effects of the Trans-Alaska Gas Project, and presents suggestions of certain actions that might be taken to enhance benefits deriving from the project.

In the interest of comprehensiveness, there are three appendices. Appendix A is a detailed discussion of the methodologies employed to derive projections of population, public finances, and housing needs. Appendix B contains certain responses to the FPC Data Request of February 1975. Responses to Questions 131, 141, 149, 152, and 164 are herein revised to reflect the new analyses described in this report. Responses 145 and 161 are as submitted to FPC and are included here, however, in order to bring together the essential body of relevant information and analyses. Similarly, Responses 118 and 143 are included because the material contained in them is basic to the analyses presented in this report.

Appendix C contains a number of tables which appeared in the Environmental Report of El Paso Alaska's Application, but which required revision to reflect the new baseline and manpower data.

A list of bibliographic references completes the report.

## 2.0 Projected Aggregate Socioeconomic Changes, 1977-1983

### 2.1 Revised Population Projections

As baseline for the socioeconomic analysis in El Paso Alaska's Application, the Trans-Alaska Oil Pipeline Project (Alyeska) was projected to increase Alaska's total population from about 357,000 in 1974 to 426,000 in 1977.[6/] The Trans-Alaska Gas Project, (T-AGP), beginning in 1977, was originally projected to raise the population to 520,000 in 1981, compared to a baseline level (without T-AGP) of 461,000 in that year.[7/] The methodology of those projections was based on Human Resources Planning Institutes's April 1974 econometric study of Alaska.[8/] Projected changes in construction employment on the Alyeska pipeline were observed to generate a lagged response in other parts of the construction sector which finally translated into changes in total employment and, ultimately, in total population.

In developing revised projections of population and employment, extensive use has been made of the HRPI/URSA study of November 1974.[9/] That study presented three alternative sets of projections (baseline, "low," and "high").

The "high" estimate is based on the assumptions that (1) the Alyeska project will not be completed until at least mid-1977, and (2) that the Trans-Alaska Gas Project is undertaken, beginning in 1977. As a result, the "high" estimate projects substantially higher levels of employment and population growth than does the HRPI projections of April 1974.

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6/ Alaska Department of Labor, Annual Population and Employment Projections, 1961-1980 (March 1974).

7/ Application, p. 3A.2-53 (Tables 3A.2-7 and 3A.2-8).

8/ Ibid., see Tables 3A.2-1 and 3A.2-2 and Figure 3A.2-2.

9/ Cited in Section 1.

The analyses in this report are based on the "high" estimate, which appears increasingly conservative. The HRPI/URSA projections after 1977 have been modified, however, due to downward revisions in El Paso Alaska's construction manpower estimates. The manpower requirements used by HRPI/URSA are higher and, based on a 1980 completion date, extend over a shorter period. El Paso Alaska currently projects completion in 1981 with a more gradual winding down of construction activities.

The original (September 1974) and the revised (Mid 1975) projected trends of population change with and without the T-AGP are depicted in Figure 1. Table 1 presents the corresponding data for the projections.[10/] Regional breakdowns of the revised projections are provided in Section 3.

Referring to Figure 1 and Table 1, the net effect of the revisions in Alyeska-only population impact projection versus the projection with Alyeska and T-AGP was to reduce the magnitude of the T-AGP growth stimulus. During the construction years 1977-1981, the incremental increase in total state population which could be attributed to the T-AGP is between 55,000 and 60,000 persons.[11/] The original estimate projected a total population increase attributable to T-AGP on the order of 65,000 to 70,000 persons. A second major result of the revision is projection of a flat trend in total population between 1980 and 1982. The original, higher estimates were based on a relatively high level of construction employment in 1980 and 1981 following the 1979-80 peak of construction work, which had the effect of sustaining the momentum of induced growth of total employment and population.

10/ The data, assumptions and methodology underlying the revised projections of population changes in the state and in impacted communities and regions of the state are presented in Appendix A.

11/ The accuracy of the projections is subject to a margin of error of at least plus or minus 10 or 20 percent. As is indicated in Appendix A, the projections are based on a number of simplifying assumptions.

Figure 1

COMPARISON OF

# ALASKA POPULATION PROJECTIONS

ORIGINAL & REVISED PROJECTIONS

WITH & WITHOUT TRANS-ALASKA GAS PROJECT

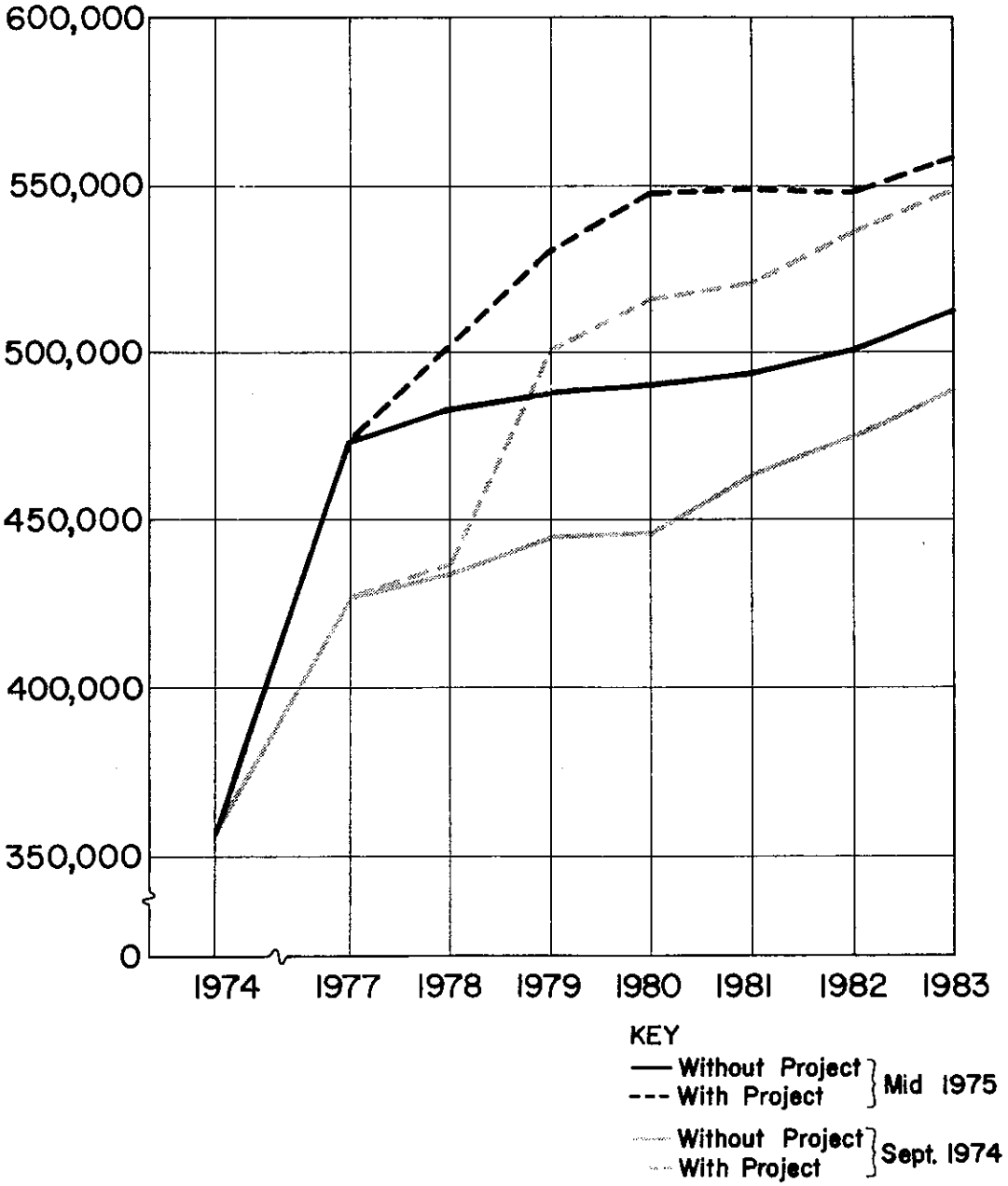


TABLE 1

COMPARISON OF ORIGINAL AND REVISED PROJECTIONS OF ALASKA POPULATION CHANGES, 1977-1983, WITH AND WITHOUT THE TRANS-ALASKA GAS PROJECT

(Thousands of Persons)

| | Total Population Year | | | | | | |
|---|---|---|---|---|---|---|---|
| | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 |
| Original Projections (9/74) | | | | | | | |
| With T-AGP | 426.0 | 437.0 | 500.0 | 515.0 | 520.0 | 535.0 | 547.1 |
| Without T-AGP | 426.0 | 432.0 | 444.0 | 448.0 | 461.2 | 474.4 | 488.0 |
| Impact | 0 | 5.0 | 56.0 | 67.0 | 58.8 | 60.6 | 59.1 |
| Revised Projections (Mid 1975) | | | | | | | |
| With T-AGP | 474.0 | 501.0 | 530.0 | 547.0 | 548.0 | 547.0 | 558.0 |
| Without T-AGP | 473.0 | 482.0 | 488.0 | 490.0 | 493.0 | 500.0 | 511.0 |
| Impact | 1.0 | 19.0 | 42.0 | 57.0 | 55.0 | 47.0 | 47.0 |
| Difference between Revised and Original Impact Projections | +1.0 | +14.0 | -14.0 | -10.0 | -3.8 | -13.6 | -12.1 |

Source: Tables 4 and 6 (See Section 3.1).

Table 2 provides a year-by-year comparison of the manpower levels of the Alyeska and El Paso Alaska projects through their respective construction periods. The average levels were used in projecting changes in total employment and population, in order to reduce the influence of transitory peak period workers on growth potentials. Clearly, Alyeska's construction manpower requirements are substantially greater than El Paso Alaska's. During the peak second and third years of construction, the Alyeska project involves nearly twice as many workers as does the T-AGP. El Paso Alaska's larger operating force (primarily at the LNG plant) results in a somewhat larger operating phase impact than Alyeska's. The slower winding-down of construction activities on the El Paso Alaska project will ease the problem of post-construction unemployment, however, since a smaller number of workers will have to be laid off in the post-peak years.

TABLE 2

ALASKAN PIPELINE PROJECTS: AVERAGE

AND PEAK ANNUAL MANPOWER LEVELS

| ALYESKA | | | T-AGP | | | Comparative Levels T-AGP minus Alyeska | | |
|---|---|---|---|---|---|---|---|---|
| Year | Average | Peak | Year | Average | Peak | Year | Average | Peak |
| (1) 1974 | 6,200 | 10,150 | (1) 1977 | 1,200 | 3,500 | 1 | -5,000 | -6,650 |
| (2) 1975 | 10,600 | 15,800 | (2) 1978 | 4,800 | 7,600 | 2 | -5,800 | -8,200 |
| (3) 1976 | 9,100 | 12,200 | (3) 1979 | 5,200 | 6,400 | 3 | -3,900 | -5,800 |
| (4) 1977 | 2,000 | 3,000 | (4) 1980 | 3,200 | 4,400 | 4 | +1,200 | +1,400 |
| (5) 1978 | 450* | 450 | (5) 1981 | 1,600 | 2,200 | 5 | +1,150 | +1,750 |
| (6) 1979 | 450* | 450 | (6) 1982 | 600* | 600 | 6 | + 150 | + 150 |
| (7) 1980 | 450* | 450 | (7) 1983 | 600* | 600 | 7 | + 150 | + 150 |

*Operating Personnel

Source: Alyeska: HRPI/URSA (Nov. 1974), Vol. I, p. 46 (Table IV-1) and pp. 196-202 (Appendix B, Tables B-15 to B-21).

T-AGP: EP-Alaska Responses to FPC Questions 118 and 143. Data rounded to nearest 100. Average based on quarterly totals; including operating personnel.

## 2.2 Revised Estimates of Aggregate Impacts

The revised estimates of changes in employment and population are the basis for revised projections of changes in income, spending, housing requirements, and costs of public services. The financial costs of the Trans-Alaska Gas Project were not affected by the revised estimate of construction manpower levels. Numbers of workers and labor costs were derived from man-hours of work on the various project components. An upward revision in the number of hours worked per man led to the decrease in worker numbers, with no appreciable reduction in total payroll costs. Therefore, no changes are projected in levels of project worker spending of wage income. The changes in the number of construction workers trigger changes in projected total numbers of housing units and levels of public services required. The changes in the locational distribution of workers lead to shifts in regional shares of wage income and spending as well as variations in housing and public service needs.

Changes in the pattern of project earnings and spending are discussed in Section 3 along with assessments of other localized project impacts. Revised estimates of impacts on a statewide basis are addressed in the following subsections.

### 2.2.1 Housing

During the construction phase of T-AGP, housing needs in the Interior and South Coastal Study Areas are projected to rise by 18,000 to 20,000 units over the level needed without the project. This projection is derived by adding the increased housing requirements in the areas primarily affected by the project (see Section 3). The 20,000-unit increase compares very closely with that projected in the Environmental Report of El Paso Alaska's Application. The effect of revising both numbers and locations of construction personnel was to shift a significant proportion out of the Interior Study Area into the South Coastal Study Area, where occupancy rates (number of inhabitants per unit) are lower than in the Fairbanks area.

### 2.2.2 Public Service Costs and Revenues

The projections of the impacts of T-AGP on state and local government service costs in the original Application and in the response to FPC data requests 127, 130, 131, and 152[12/] have been revised extensively. The revisions reflect not only the current T-AGP construction manpower requirements, but also the emerging governmental policies with respect to impacts of the Alyeska project. Those policies are significant because precedents set by the state in connection with the Alyeska project will strongly affect treatment of T-AGP impacts.

In the Application, it was reported that the Alaska State Legislature had approved the budgeting of $33.1 million in general funds for Alyeska pipeline impact aid to communities, boroughs, school districts and various state agencies.[13/] That legislation was not signed into law, but other legislation was enacted, providing $10 million in direct grants for Anchorage, Fairbanks, Valdez and other communities and boroughs along the route of the pipeline.[14/] All of these funds have been disbursed. In addition, the same law (Section 17(b)) appropriated $11.8 million to the Office of the Governor for operating expenditures for "state services pipeline impacts." By April 1975 approximately $7.53 million of these funds had been allocated to various state agencies, with education and public safety agencies receiving the largest amounts.[15/]

12/ Data request of 2/7/75; responses submitted in April 1975.

13/ El Paso Alaska Application, p. 3A.2-38.

14/ Application, p. 2A.7-28; Eighth State Legislature, General Appropriations Act, Ch. 147, SLA 1974, Section 17(a).

15/ Personal Communication to M. C. Holland from John B. Chenoweth, Director, Alaska Department of Community and Regional Affairs, April 8, 1975.

In special session, in June 1974, the Legislature authorized and funded an additional $10 million for "discretionary impact assistance" to boroughs and communities impacted by the oil pipeline. In addition, another $2 million was appropriated to the Governor's Office for state agencies to use in providing services in unorganized boroughs along the pipeline route.[16/]

By early April 1975, a total of about $17.5 million of the $20 million appropriated had been disbursed to boroughs and municipalities as impact assistance. Of the $13.8 million appropriated to the Office of the Governor, over $7.5 million had been allocated to state agencies, and about $840,000 to assist the unorganized boroughs.

To summarize, by April 1975, the state government had approved funding of $33.8 million in oil pipeline impact grants, of which about $25.8 million had been allocated. Virtually all funds are for operating expenses. Grants for capital improvements in the $10 million discretionary grant authorization have been limited to such facilities as relocatable classrooms and land for parks and recreation areas, which accounted for $2.17 million or 29 percent of $7.45 million in discretionary grant funds already awarded.[17/]

At the risk of overgeneralizing, it is useful to relate the Alyeska impact grants to the population impacts of that project and apply the same relationship to the population changes expected as a result of the T-AGP. The HRPI/URSA study estimates that between 1973 and 1977 the state population will rise from 357,200 to 473,000.[18/] Without the Alyeska project, the statewide total probably would reach less than 400,000 persons by mid-1977, assuming a continuation of the 1970-1974 average annual growth rate of total population of about four

16/ Ibid.

17/ Ibid.

18/ See Table 4 in Section 3.1.

percent per year. Thus the $33.8 million approved for oil pipeline impact grants may be associated with a 74,000-person increase in the state's population as a result of the Alyeska project. The El Paso Alaska project is expected to produce an increment to the state's population of some 55,000 persons[19/] by the 1981 completion date, falling back to a long-term difference of 47,000 after full operations begin. The 55,000 person increase associated with the T-AGP is 74 percent of the Alyeska project's expected stimulus to population growth, which would suggest that - other things being equal - the additional operating costs of public services generated by T-AGP induced growth would be on the order of 74 percent of $33.8 million, or $25 million (constant 1973 dollars).

The figure of $25 million for T-AGP-induced public service cost increases can only be considered as an order-of-magnitude maximum estimate of the project's impact. Other things are not likely to be equal. Actual costs are likely to be substantially lower because the marginal costs of most public services decline with increases in the scale of operations. The relative increase in demand for public services is more significant than the absolute change in the number of service users in generating increased service costs.[20/] Municipal, borough, and state agency organizations will have experienced the greatest shocks of change before the El Paso Alaska project begins. With T-AGP the state's total population will increase by 15 percent between 1977 and 1981;[21/] the corresponding period with the Alyeska project

19/ See Table 5 in Section 3.1.

20/ See Alaska State Legislature Special Petroleum Impact Committee, "Report on Impact of Trans-Alaska Pipeline Construction on Government Services and Facilities", (Juneau, February 12, 1974) p. 23; to quote: "Population increases will occur in most Alaskan cities, and in general, the impact will be in proportion to the increase. However, the relative impact on any community will be more related to the percentage of population increase rather than the number of persons arriving in any given community."

21/ Calculated from Table A-1, Appendix A.

(1974-1977) will see a 32 percent increase in total population. Thus, the public service cost impact of the Trans-Alaska Gas Project is likely to be closer to 50 percent than 74 percent of that of Alyeska.

Changes in operating costs and revenues of boroughs and municipalities along the pipeline route and in the Anchorage area as a result of T-AGP have been recalculated and are presented in Section 3. Total community T-AGP related impact funding requirements have been estimated at $11.85 million (in 1973 dollars). The $11.85 million represents anticipated shortfall in local revenues during the 1977-1981 construction period, and may be compared with the impact grants of $22 million approved in 1974 for covering the cash shortages of municipal and borough governments during the Alyeska project construction period.[22/] By similar reasoning, it is estimated that approximately $6 million, or one-half the $11.8 million allocated to state agencies by the 1974 Legislature for Alyeska-induced impacts on state-supplied services, would probably suffice to cover T-AGP induced increases in state services costs during 1977-1981.

The projected T-AGP impact financing requirements of approximately $18 million ($11.85 million local plus $6 million for the state government) during the construction period represent a significant revision from earlier El Paso Alaska estimates. In Response 127, total impact costs during construction and the first two years of regular operations (1977-1983) were estimated at $244 million. The large reduction in the estimate is based on two factors: analysis in terms of incremental costs versus incremental revenues, and exclusion of capital costs for new facilities from the per capita service cost factors. This more realistic analysis is now possible because public service cost data have become available for developing a common basis of comparison with the Alyeska impact projections.

22/ Assuming constant value dollars.

Table 3 presents the revised estimate of the T-AGP impact on aggregate state and local government finances. Table 3 differs from its predecesor in that it excludes projections of aggregate revenues and costs over the 25 year operating life of the T-AGP facilities. Such projections are less meaningful in the limited focus of public finance impacts. A broader assessment of relative benefits and costs of the project will be presented in Section 4 of this report.

In Table 3, the first set of data relates to the 1977-1981 construction period, while the second set covers annual amounts after pipeline operations begin. Revenues from the personal income tax are based on income taxes paid directly by project personnel (estimated to average 5 percent of gross wages) plus an estimate of income taxes paid on the portion of local spending by T-AGP personnel that becomes taxable income to other Alaskans. This latter amount is based on data prepared for estimating sales tax revenues, which was the subject of FPC data request No. 152 (see Response No. 152 in Appendix B).[23/] On the basis of studies of the composition of factor incomes in the Alaskan economy, it is estimated that two-thirds of direct and induced spending from the T-AGP project becomes taxable income to other Alaskans.[24/]

Corporate Income Tax payments are projected to be $23.2 million per year. Property taxes are higher than originally estimated and now include payments for T-AGP work in progress.[25/] It is assumed that one or two years elapses between construction, appraisal, and payment of the tax. Thus Table 3 includes estimated payments for the first three years of construction.

23/ Per Response No. 152, total spending in the state is projected to equal 1.5 times all of the after-tax, or disposable, income of T-AGP operating personnel and one-half of construction workers' disposal income.

24/ Institute of Social, Economic and Government Research, "Gross State Product, 1961-1972", April 1974.

25/ Under the statewide oil and gas exploration, production and pipeline transportation property tax law, AS.43.56.

TABLE 3

[Table 130 (Revised Mid 1975)]

COMPARISON OF PUBLIC REVENUE AND COST IMPACTS OF TRANS-ALASKA GAS PROJECT
(Millions of 1973 Dollars)

| Source | Total Impact Revenues and Costs 1977-1981 | Annual Impact Revenues and Costs 1982 and Beyond |
|---|---|---|
| Personal Income[1/] | | |
| T-AGP Personnel | 35.6 | 0.5 |
| Other Alaskans | 14.3 | 0.5 |
| Total | $ 49.9 | $ 1.0 |
| Corporate Income Tax[2/] | $ 0 | $ 23.2 |
| Property Taxes | | |
| T-AGP Facilities[3/] | 86.2 | 72.5 |
| Residential/Community[4/] | 15.5 | 11.6 |
| Total | $101.7 | $ 84.1 |
| Sales Taxes[5/] | $ 4.8 | $ 0.2 |
| Use Taxes[2/] | $ 9.7 | N/A |
| SUBTOTAL | $166.1 | $108.5 |
| Less: Estimated Public Service Impact Costs[6/] | - 97.2 | - 25.5 |
| Cash Balances | $ 68.9 | $ 83.0 |
| Plus: Royalty Incomes[7/] | | 67.5 |
| Production Tax[7/] | | 21.6 |
| TOTAL | | $172.1 |

Notes:

1/ Five percent of sum of gross project payroll plus two-thirds of direct and induced local spending (see Response #152, Appendix B).

2/ See Response #149-a, Appendix B. No taxable income accrues until operations begin in 1982.

3/ Based upon tax rate of 20 mills applied to total capital costs from El Paso Alaska's Prepared Direct Testimony and Proposed Hearing Exhibits Vol. III of V dated 3/24/75, at Docket Nos. CP75-96 et al, Exhibit EP-58 (CRJ-2), Schedules 2 and 3.

4/ Equals product of annual population increments multiplied by average assessed value per capita of $12.400 (per Alaska-Taxable, 1975) at tax rate of 20 mills.

5/ See Response #152, Appendix B.

6/ 1977-81 total per Table 16, in Section 3.2, plus an additional $6 million for state supplied impact services (see text). Data for 1982 and beyond are products of long-term population increments in various jurisdictions (Appendix Table A-6) multiplied by cost factors in Appendix Table A-5.

7/ Paid by North Slope oil and gas producers. Royalty Income calculated at 12.5% and Production Tax at 4% of wellhead price, assumed to be $0.40 per MMBtu.

Expansion of residential and business property was projected to yield an additional $15 million in property taxes during the construction period (allowing for a one-to-two year lag). This estimate is based on projected population increments during the first three years of construction (see Appendix Table A-1), per capita average assessed valuation of $12,400[26/] and a tax rate of 20 mills. After operations commence, the long-term incremental increase in the state's population attributable to T-AGP (45,000-50,000) is projected to generate an additional $11.6 million per year, apart from an average of $72.5 million annually from T-AGP facilities.

The recalculation of construction manpower requirements for the T-AGP shifted more pipeline workers to the South Coastal Area, thus increasing slightly the estimated amount of worker and induced spending occurring in the Valdez area. This additional spending led to a small increase in the estimate of sales taxes during construction from $4.6 million to $4.8 million.

To summarize, the effects of revising the calculation of T-AGP manpower requirements on public service operation costs in the state have led to a reestimation of total impact funding requirements; these are projected at approximately $12 million for local governments and an additional $6 million for the state government. The majority of the $18 million total must come from the State's revenues in view of its superior taxation powers (e.g., the oil and gas royalties and production taxes) and its responsibility to fund over 80 percent of educational costs as well as a significant share of local public safety, cultural, and public health costs (through revenue sharing programs).

26/ As applied to property in Fairbanks North Star Borough by the Alaska State Department of Community and Regional Affairs, Alaska-Taxable, (January 1974).

The end-of-period cash balances before royalty payments and production taxes are positive during both construction and operating phases. On an aggregated basis, then, even during construction, the Trans-Alaska Gas Project is expected to generate a cash surplus in the public sector of the state. However, the distribution of the revenues is highly skewed toward state government while the costs will accrue mainly to borough and municipal governments.

## 3.0 Projected Local Area Socioeconomic Changes, 1977-1983

### 3.1 Revised Projections of Study Area Populations

Recalculation of El Paso Alaska's construction manpower requirements together with a specific allocation of the work force among the various census divisions of the state, provided a basis for reestimating localized population changes and other socioeconomic impacts of the Trans-Alaska Gas Project. Tables 3A.2-7 and 3A.2-8 of the Environmental Report of the Application[28/] provided projections of population change by Study Area for the years 1977-1983. Revised versions of these tables appear here as Tables 4 and 6. Table 5 (also designated Table 3A.2-7A) is new, supplying the incremental changes over the projected baseline.

The revisions represent significant changes for the Interior and South Coastal Study Areas. The Arctic Area projections were virtually unaffected, however, because manpower requirements were not greatly changed and little induced growth of population is expected. A graphical portrayal of the original and revised projections is given in Figure 2. Most noteworthy is the shift of a substantial portion of the project's growth effects to the South Coastal Study Area. This resulted from the recalculation of construction worker job location, which had the effect of shifting workers from the Interior to the South Coastal Study Area.

As indicated in Table 5 and Figure 2, the Arctic Study Area population is projected to experience its greatest growth due to T-AGP in 1978, with the incremental population increase diminishing thereafter to a permanent difference over the non-project baseline of about 100 persons.

28/ Op. Cit., Vol. V, p. 3A.2-53.

TABLE 4

[Table 3A.2-7 (Revised July 1975)]

BASELINE POPULATION PROJECTIONS FOR STUDY AREAS
1977-1983, WITHOUT TRANS-ALASKA GAS PROJECT OE
(Thousands of Persons)

| STUDY AREA | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 |
|---|---|---|---|---|---|---|---|
| Arctic | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Interior | 83.0 | 83.9 | 84.7 | 85.6 | 86.5 | 87.4 | 88.3 |
| South Coastal | 232.9 | 237.3 | 240.3 | 241.3 | 242.7 | 246.2 | 251.6 |
| Other | 152.1 | 155.8 | 158.0 | 158.1 | 158.8 | 161.4 | 166.0 |
| TOTAL ALASKA | 473.0 | 482.0 | 488.0 | 490.0 | 493.0 | 500.0 | 511.0 |

Note: Totals may not add due to rounding.
Source: Based on Appendix Tables A-1 and A-4.

TABLE 5

[Table 3A.2-7A]

INCREMENTAL POPULATION GROWTH WITH THE TRANS-ALASKA GAS PROJECT
(Thousands of Persons)

| STUDY AREA | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 |
|---|---|---|---|---|---|---|---|
| Arctic | | | | | | | |
| Induced Employment | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Direct Employment | 0.2 | 0.5 | 0.3 | 0.2 | 0.2 | 0.1 | 0.1 |
| Total | 0.2 | 0.5 | 0.3 | 0.2 | 0.2 | 0.1 | 0.1 |
| Interior | | | | | | | |
| Induced Employment | 0 | 2.5 | 4.4 | 4.9 | 4.8 | 4.2 | 4.2 |
| Direct Employment | 0.6 | 1.2 | 0.9 | 0.4 | 0.3 | 0.1 | 0.1 |
| Total | 0.6 | 3.7 | 5.3 | 5.2 | 5.1 | 4.3 | 4.3 |
| South Coastal | | | | | | | |
| Induced Employment | 0 | 11.5 | 32.6 | 49.1 | 48.2 | 41.8 | 41.8 |
| Direct Employment | 0.2 | 3.2 | 3.8 | 2.4 | 1.0 | 0.4 | 0.4 |
| Total | 0.2 | 14.7 | 36.4 | 51.5 | 49.2 | 42.2 | 42.2 |
| Total Induced Employment | 0 | 14.0 | 37.0 | 54.0 | 53.0 | 46.0 | 46.0 |
| Total Direct Employment | 1.0 | 5.0 | 5.0 | 3.0 | 2.0 | 1.0 | 1.0 |
| GRAND TOTAL | 1.0 | 19.0 | 42.0 | 57.0 | 55.0 | 47.0 | 47.0 |

Note: Totals may not add due to rounding.
Source: Tables 4 and 6.

TABLE 6

[Table 3A.2-8 (Revised July 1975)]

IMPACT POPULATION PROJECTIONS FOR STUDY AREAS
1977-1983, WITH TRANS-ALASKA GAS PROJECT
(Thousands of Persons)

| STUDY AREA | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 |
|---|---|---|---|---|---|---|---|
| Arctic | 5.2 | 5.5 | 5.3 | 5.2 | 5.2 | 5.1 | 5.1 |
| Interior | 83.6 | 87.6 | 90.0 | 90.8 | 91.6 | 91.7 | 92.6 |
| South Coastal | 233.1 | 252.0 | 276.7 | 292.8 | 291.9 | 288.4 | 293.8 |
| Other | 152.1 | 155.9 | 158.0 | 158.2 | 159.3 | 161.8 | 166.5 |
| Total | 474.0 | 501.0 | 530.0 | 547.0 | 548.0 | 547.0 | 558.0 |

Source: Developed from Appendix Tables A-1 and A-4.

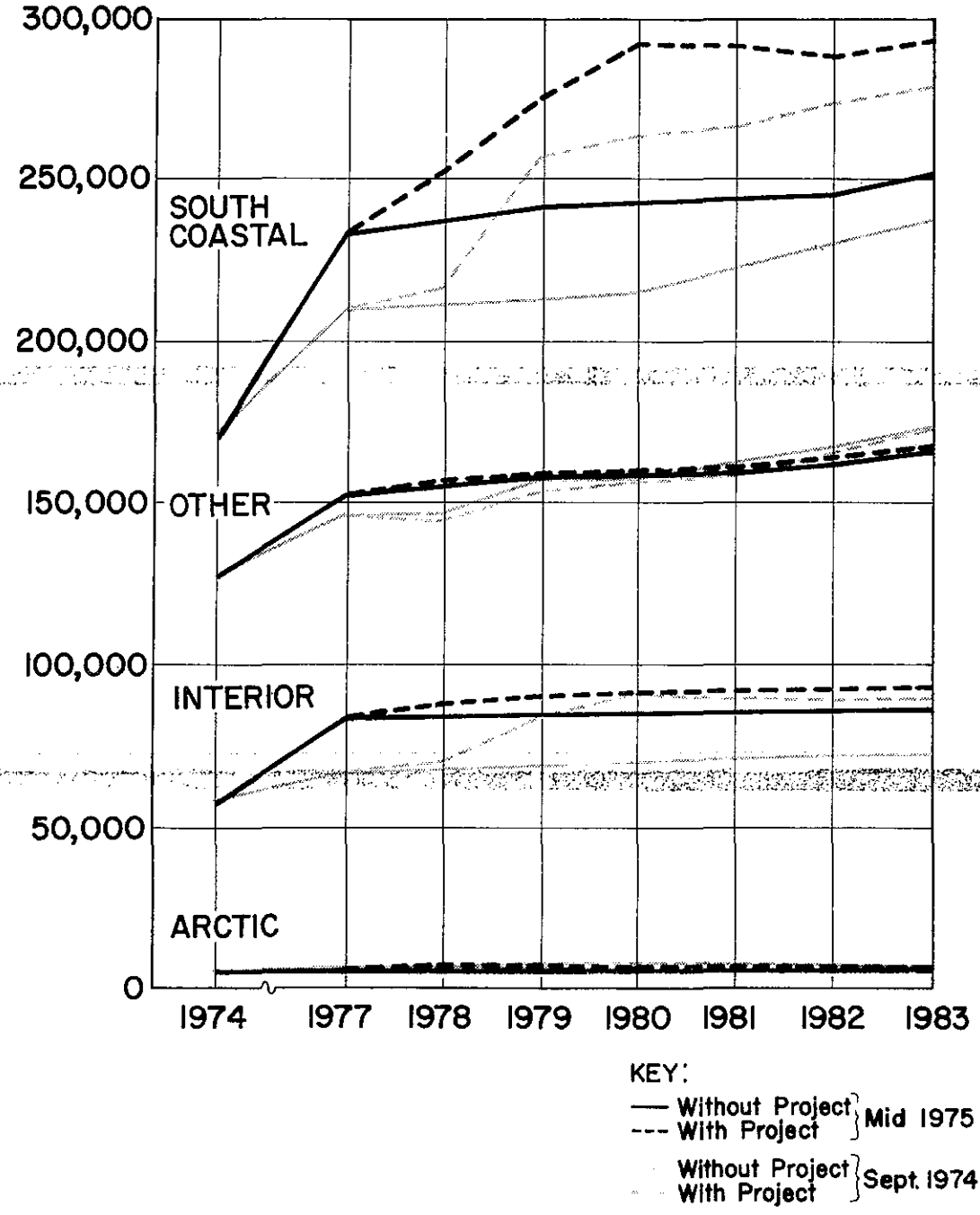
Figure 2

COMPARISON OF

# ALASKA POPULATION PROJECTIONS

ORIGINAL & REVISED PROJECTIONS BY STUDY AREA

WITH & WITHOUT TRANS-ALASKA GAS PROJECT



Peak growth in the Interior Study Area is expected to occur in 1979 when the increment associated with T-AGP will be about 5,300 additional persons. By 1981, the final year of construction, both induced population and direct employment are projected to decline, but are expected to stabilize in 1982 after pipeline operations commence.

The greatest population change will occur in the South Coastal Study Area. More than two-thirds of the T-AGP jobs and over 80 percent of the employee households will be located in the area.[29/] By 1980 the projected growth is estimated at 51,500 persons. Most of the growth will be in the Anchorage area which, as the state's primary metropolitan area and port of entry, will attract many new residents and visitors to the state.

## 3.2 Revised Estimates of Localized Impacts

### 3.2.1 Arctic Study Area

No significant revisions have been made in projections of socioeconomic impacts in the Arctic Study Area. A revised version of Table 3A.2-5, "Principal Project Construction and Operations Characteristics, Arctic Study Area," is presented as Table 7. There have been only small changes in manpower levels and costs as a result of the recalculation of project manpower requirements. As can be seen in Figure 2, the current projected baseline and "with-project" levels of population overlay the original projections.

Revised projections of population and employment in the Area are provided in Tables 8 and 9, respectively. Population variations are expected to stem almost entirely from changes in petroleum and gas employment on the North Slope. In the native villages, natural growth

29/ See Appendix Tables A-3 and A-4.

TABLE 7

[Table 3A.2-5 (Revised July 1975)]

PRINCIPAL PROJECT CONSTRUCTION AND OPERATION CHARACTERISTICS, ARCTIC STUDY AREA

| | |
|---|---|
| Length of pipeline in area | 162.5 miles |
| Number of compressor stations | 3 |
| Number of maintenance bases | 1 |
| Estimated capital costs ($ 1973) | $390.1 million[1/] |
| Estimated direct construction labor costs ($ 1973) | $ 78.1 million[2/] |
| Estimated maximum construction labor force (Winter 1979) | 806 [3/] |
| Estimated annual operation costs ($ 1973) | $ 14.3 million[4/] |
| Estimated annual operating payroll (61 men) | $ 1.1 million[1/] |
| Estimated annual ad valorem property taxes | $ 7.8 million[5/] |

Sources:

1/ El Paso Alaska's Prepared Direct Testimony and Proposed Hearing Exhibits Vol. III of V dated 3/24/75, at Docket Nos. CP75-96 et al, Exhibit EP-58 (CRJ-2), Schedule 2, Sheet 4 of 4.

2/ Arctic area work force proportionate share of total pipeline labor costs (exclusive of home office administrative and general support expense), per Application (9/24/74), Vol. II, p. 2.3-2.

3/ Response 118, (see Appendix B).

4/ Application (9/24/74), Vol. V, p. 3A.2-49.

5/ Based upon tax rate of 20 mills applied to estimated capital costs.

TABLE 8

[Table 3A.2-9 (Revised July 1975)]

ESTIMATED ANNUAL CHANGE IN POPULATION DUE TO
T-AGP CONSTRUCTION, 1977-1983 ARCTIC STUDY AREA

| | Year | | | | | | |
|---|---|---|---|---|---|---|---|
| | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 |
| With T-AGP | 5,200 | 5,500 | 5,300 | 5,200 | 5,200 | 5,100 | 5,100 |
| Without T-AGP | 5,000 | 5,000 | 5,000 | 5,000 | 5,000 | 5,000 | 5,000 |
| Increment due to T-AGP | 200 | 500 | 300 | 200 | 200 | 100 | 100 |

Note: Above data are computed by subtracting data in Table 4 from corresponding figures in Table 6.

TABLE 9

[Table 3A.2-10 (Revised July 1975)]

PROJECTED EMPLOYMENT, ARCTIC STUDY AREA, 1977-1982 (mid-year)

| | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 |
|---|---|---|---|---|---|---|
| Baseline Employment | | | | | | |
| Petroleum | 1,200 | 1,000 | 1,000 | 1,000 | 1,000 | 1,000 |
| Non-petroleum | 1,000 | 1,050 | 1,100 | 1,150 | 1,200 | 1,250 |
| Subtotal | 2,200 | 2,050 | 2,100 | 2,150 | 2,200 | 2,250 |
| T-AGP Project[1/] | 260 | 470 | 330 | 200 | 160 | 60 |
| Total | 2,460 | 2,520 | 2,430 | 2,350 | 2,360 | 2,310 |

1/ Average annual number of Arctic Study Area pipeline construction and operating personnel, (see Response 143, Appendix B).

is expected to be offset by migration to the Fairbanks and Anchorage areas of young adults seeking work opportunities. It is uncertain what the effect will be of the Alaskan Native Claims Settlement Act and state-provided pipeline impact funds on the North Slope Borough in stimulating population expansion, but it is expected that these sources of funds will adequately provide for any upgrading or expansion of social and public services that may be undertaken.

In view of the negligible revisions in population and employment projections for the Arctic Study Area, no changes have been made in the analyses and findings presented in the Environmental Report of the Application.[30/]

### 3.2.2 Interior Study Area

The Interior Study Area, although containing the longest segment of the T-AGP pipeline, accounts for only about one-fifth of the construction manpower to be used for the Trans-Alaskan Gas Project. Recalculation of manpower requirements together with the reestimation of the area population baseline significantly reduced the net population impact of T-AGP. These results are shown graphically in Figure 2, and in tabular form in Tables 4, 5, and 6.

The current estimate of employment change (T-AGP impact) in the Interior Study Area is provided in Table 10. Population changes in the Fairbanks area (the Fairbanks North Star Borough plus Eielson AFB and Ft. Wainwright, all of which comprise the Fairbanks Census Division) are given in Table 11. Changes outside the Fairbanks area are presented in Tables 12 and 13.

A summary of the principal construction and operating characteristics of T-AGP in the Interior Study Area is provided in Table 14.

30/ Op. Cit., Vol. V, pp. 3A.2-48 to 3A.2-62.

TABLE 10

[Table 3A.3-12 (Revised July 1975)]

PROJECTED CIVILIAN EMPLOYMENT, INTERIOR STUDY AREA, 1977-1982

| Basis | Middle of Year | | | | | |
|---|---|---|---|---|---|---|
| | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 |
| Baseline Employment[1/] | 30,000 | 30,300 | 30,600 | 30,900 | 31,300 | 31,600 |
| T-AGP Impact[2/] | | | | | | |
| Direct[3/] | 600 | 1,200 | 900 | 400[4/] | 300[4/] | 130[4/] |
| Induced[4/ 5/] | 0 | 400 | 1,400 | 1,900 | 2,000 | 1,770 |
| Subtotal | 600 | 1,600 | 2,300 | 2,300 | 2,300 | 1,900 |
| Total | 30,600 | 31,900 | 32,900 | 33,200 | 33,600 | 33,500 |

1/ Derived from HRPI/URSA, 1974.

2/ Derived from Table 5 by dividing area population change by labor participation ratio, less estimated unemployed, see Table A-2 (Appendix A).

3/ Source: Table 5. During the fall and winter of 1978-1979, peak study area construction employment of 2,000 is projected.

4/ Includes operating personnel: 1980-70; 1981-120; 1982 and beyond-130.

5/ Estimate based on difference between baseline employment trend plus direct T-AGP employment subtracted from projected study area total employed labor force. Thus, induced component includes exogenous growth factors after peak of direct project employment is reached.

TABLE 11

PROJECTED POPULATION IMPACTS OF THE TRANS-ALASKA GAS PROJECT IN THE FAIRBANKS CENSUS DIVISION
(Thousands of Persons)

| | Year | | | | | | |
|---|---|---|---|---|---|---|---|
| | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 |
| With T-AGP | 71.8 | 75.8 | 78.3 | 78.5 | 78.8 | 79.1 | 80.8 |
| Without T-AGP | 71.7 | 73.1 | 74.0 | 74.3 | 74.7 | 75.8 | 77.5 |
| Increment due to T-AGP | 0.1 | 2.7 | 4.3 | 4.2 | 4.1 | 3.3 | 3.3 |

Source: Tables 3A.3-7 (Rev.) and 3A.3-8 (Rev.) in Appendix C.

TABLE 12

[Table 3A.3-5 (Revised July 1975)]

INCREMENTAL POPULATION GROWTH IN INTERIOR STUDY AREA
DUE TO TRANS-ALASKA GAS PROJECT, 1977-1983

| | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 |
|---|---|---|---|---|---|---|---|
| Interior Area | 600 | 3,700 | 5,300 | 5,200 | 5,100 | 4,300 | 4,300 |
| Fairbanks | 100 | 2,700 | 4,300 | 4,200 | 4,100 | 3,300 | 3,300 |
| Outside Fairbanks | 500 | 1,000 | 1,000 | 1,000 | 1,000 | 1,000 | 1,000 |

Source: Derived from Table 5. Portion of increase going to Fairbanks estimated on basis of assumption that majority of induced population growth in Interior Study Area would result from relocation of worker households to region's principal urban area.

TABLE 13

[Table 3A.3-6 (Revised July 1975)]

TYPE OF POPULATION IN INTERIOR STUDY AREA
OUTSIDE OF FAIRBANKS, 1977-1983

| | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 |
|---|---|---|---|---|---|---|---|
| Total projected increase outside Fairbanks | 500 | 1,000 | 1,000 | 1,000 | 1,000 | 1,000 | 1,000 |
| Less project construction workers[1/] | 500 | 950 | 650 | 300[2/] | 250[3/] | 100[4/] | 100[4/] |
| Induced population outside Fairbanks | 0 | 50 | 350 | 700 | 750 | 900 | 900 |

1/ In camps outside of Fairbanks; estimated at approximately 75% of Interior Study Area portion of pipeline construction personnel (annual average).

2/ Includes an estimated 30 operating personnel.

3/ Includes an estimated 60 operating personnel.

4/ All operating personnel.

TABLE 14

[Table 3A.3-2 (Revised July 1975)]

PRINCIPAL PROJECT CONSTRUCTION AND OPERATION CHARACTERISTICS, INTERIOR STUDY AREA

| | |
|---|---|
| Length of pipeline | 592 miles |
| Number of compressor stations | 9 |
| Number of maintenance bases | 2 |
| Estimated capital costs ($ 1973) | $1,412.0 million[1/] |
| Estimated direct construction labor costs ($ 1973) | $ 194.2 million[2/] |
| Estimated maximum construction labor force (Fall 1978-Winter 1979) | 2,000+[3/] |
| Estimated annual operating costs ($ 1973) | $ 52.0 million[4/] |
| Estimated annual operating payroll (130 men) | $ 2.3 million[2/] |
| Estimated annual ad valorem taxes | $ 28.2 million[5/] |

Source:

1/ El Paso Alaska's Prepared Direct Testimony and Proposed Hearing Exhibits Vol. III of V, dated 3/24/75, at Docket Nos. CP75-96 et al, Exhibit EP-58 (CRJ-2), Schedule 2, Sheet 4 of 4.

2/ Interior area work force proportionate share of total pipeline labor costs (exclusive of home office administrative and general support expense), per Application (9/24/74), Vol. II, p. 2.3-2.

3/ Response 118, (see Appendix B).

4/ Application (9/24/74), Vol. v, p. 3A.3-7.

5/ Based upon tax rate of 20 mills applied to estimated capital costs.

Comparison of the revised table with the original will show a reduction in construction labor costs, peak construction labor, and operating payroll.

Comparative impacts within the Interior Study Area as determined by the analyses reported in the Environmental Report of El Paso Alaska's Application and in the present report are as follows:

| | September 1974 | Mid 1975 |
|---|---|---|
| Percent increase in study area population by end of construction (1977-1981) | | |
| Interior Study Area | 35.8% | 9.6% |
| Fairbanks Area | 26.8% | 15.2% |
| Absolute increase 1977-1981 | | |
| Interior Study Area | 27,700 | 8,000 |
| Fairbanks Area | 14,600 | 7,000 |
| Difference of 1981 impact population over 1981 normal growth level | | |
| Interior Study Area | 19,400 | 5,100 |
| Fairbanks Area | 13,100 | 4,100 |

The principal significance of these revisions is a sharp reduction in the projected pressures of the T-AGP on the social, economic and physical resources and absorptive capacities of the Study Area. The revisions suggest that the incremental impacts of the El Paso Alaska project will be even less significant than originally estimated, and thus give more weight to the assertion that changes induced by the Alyeska project will accommodate, to a greater degree, further changes induced by T-AGP.

### 3.2.2.1 Income and Spending

In the original Application (Vol. V, Section 3A.3.5.3.4, "Income Changes"), it was estimated that the Interior Study Area would experience an aggregate increase in income and spending of approximately

$100 million during the construction phase. This increase would be the result of spending by Arctic and Interior Study Area workers plus induced spending by recipients of the worker outlays (via the 1.5 "multiplier effect"). Recalculation of construction manpower requirements has had the effect of reducing total spending in the area during the 1977-1981 period by about 20 percent, from $100 million to an estimated $80 million. After pipeline operations begin, area spending by operating personnel in the Arctic and Interior Study Areas, together with induced spending from the multiplier effect, is projected at about $2 million per year. It is estimated that three-fourths or more of this spending will take place in the City of Fairbanks, generating sales tax revenues on the order of $1.0-1.5 million during the construction phase, and $30,000-$40,000 per year after 1981.[31/]

#### 3.2.2.2 Housing

Housing requirements in the Interior Study Area were originally estimated to increase by about 3,700 units over normal growth requirements because of the El Paso Alaska project. With the recalculation of construction manpower requirements and population projections, the housing requirement estimate is reduced to a maximum increment in the Borough of 2,300 units. The revised estimates are presented in Table 15.

#### 3.2.2.3 Public Service Costs & Revenues

Population in the Interior Study Area will increase approximately 10 percent during the construction period (1977-1981). As a result the Fairbanks North Star Borough and the City of Fairbanks will experience increases in public service operating costs. Table 16 gives estimated net incremental costs during the construction period. The Fairbanks North Star Borough and the City of Fairbanks will incur total estimated public service costs of approximately $6.4 million and $4.3

31/ See Response No. 152 in Appendix B.

TABLE 15

[Table 3A.3-9 (Revised July 1975)]

PROJECTED HOUSING UNIT REQUIREMENTS FOR FAIRBANKS NORTH STAR BOROUGH WITH AND WITHOUT THE TRANS-ALASKA GAS PROJECT, 1977-1983

(Thousands of Units)

| | Year | | | | | | |
|---|---|---|---|---|---|---|---|
| | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 |
| With T-AGP | 21.2 | 22.9 | 24.0 | 24.1 | 24.3 | 24.1 | 24.3 |
| Without T-AGP | 21.2 | 21.6 | 21.8 | 21.9 | 22.0 | 22.4 | 22.9 |
| Increases | 0 | 1.3 | 2.2 | 2.2 | 2.3 | 1.7 | 1.4 |

Source: Derived from Tables 3A.3-7 (Rev.) and 3A.3-8 (Rev.) in Appendix C, assuming 3.4 persons per housing unit.

TABLE 16

[Table 127 (Revised July 1975)]

ESTIMATED NET INCREMENTAL PUBLIC SERVICE COSTS 1977-1981[1/]
TRANS-ALASKA GAS PROJECT
1974 DOLLARS ($000)

| Public Service System | Greater Anchorage Area Borough | City of Anchorage | Fairbanks North Star Borough | City of Fairbanks | City of Cordova | Other Impact Areas | Total |
|---|---|---|---|---|---|---|---|
| General Government | 3,957 | 989 | 313 | 1,314 | 1,478 | 555 | 8,606 |
| Public Safety | 989 | 9,893 | - | 1,786 | 1,379 | 518 | 14,565 |
| Public Health | 4,946 | - | 31 | 42 | 99 | 37 | 5,155 |
| Public Works | 330 | 660 | 26 | 1,119 | 1,872 | 703 | 4,710 |
| Recreation | 989 | 1,979 | 82 | - | 788 | 296 | 4,134 |
| Education | 44,187 | - | 5,914 | - | 1,500[2/] | 2,479 | 54,080 |
| Gross Impact Costs | 55,398 | 13,521 | 6,366 | 4,261 | 7,116 | 4,588 | 91,250 |
| Less Impact Revenues[3/] | -50,354 | -12,289 | -5,303 | -3,550 | -4,286 | -3,614 | -79,396 |
| Net Impact Costs[4/] | 5,044 | 1,232 | 1,063 | 711 | 2,830 | 974 | 11,854 |

1/ These represent operation costs to the governmental unit over a period of 5 years (1977-1981). Cost factors derived from the level of aid received by the governing bodies from direct and discretionary grants awarded by the State for the period 1974-1976 and from city and borough budgets for 1974-1975 (Appendix Table A-5).

2/ Net value of impact cost, as supplied by Cordova School Department.

3/ These represent the estimated proceeds of local sales and property taxes (excluding those levied on T-AGP assets) and state revenue sharing pertaining to incremental population.

4/ These represent shortfalls in current operating finances attributable to service costs rising more rapidly than normal revenue sources can accommodate.

million respectively.[32] The most significant costs are in the categories of education and public safety, followed by general government and public works. The categories include the costs of additional classrooms, teachers, and policemen as well as the increased costs in government administration and the costs of providing expanded road, water and sewage systems. The operating revenues of the Fairbanks North Star Borough would increase an estimated $5.3 million over the construction period resulting in a net impact deficit of about $1.1 million.[33] The City of Fairbanks would receive estimated impact revenues of $3.6 million resulting in net impact deficits of $700,000 during the construction period.

The long-term population gain due to T-AGP in the Interior Study Area is estimated at 4,300 or about 5 percent over the baseline. Less than 100 T-AGP operating personnel are expected to be employed in the Interior Area. During the operating period (commencing in 1982), these communities will continue to incur additional public service operating costs of approximately $3 million annually. By 1981, however, revenues will have increased to their full level and the Fairbanks North Star Borough and the City of Fairbanks are not projected to experience any annual deficits as a result of the El Paso Alaska Project.

The population increases will trigger a need for additional public safety and education personnel. The current population estimates indicate that the peak population increment in the Fairbanks Census Division will occur in 1979, averaging 4,300 persons (Table 11). Accordingly, eight to nine additional permanent officers would be required in the city and surrounding borough, plus a number of temporary officers to deal with overloads from transients. This estimate is less than one-third that reported in the Application.[34]

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32/ Estimated costs and revenues were calculated by multiplying per capita public service cost factors by projected changes in population. (See Appendix A).

33/ From existing sources; excludes direct taxes on pipeline facilities in the Borough.

34/ Op. Cit., Vol. V, p. 3A.3-17 and revised Response #164 (See Appendix B).

Educational staffing requirements in Fairbanks were originally projected to increase by 165 personnel by 1980, but with the new projections, staff increases should not exceed 50 personnel. Tables 17 and 18 provide updated projections of additional students and educational staff for Fairbanks. These tables indicate reductions in maximum educational impacts on the order of 70 percent from those originally projected.

The impact of T-AGP on communities outside the Fairbanks area is not expected to be great. In Table 13, the long-term increment to the unorganized borough populations of the Interior Study Area is projected at about 900 persons. Seasonal peaks during construction will add substantially to the baseline, and impact funding of local public services and a temporary increase in state-provided services such as schools and the Alaska State Troopers will be necessary.

No specific estimates of temporary or long-term increases in costs of public services have been made for such Interior area communities as Delta Junction, Paxson, Gulkana, Glennallen, Tonsina, etc., due to the lack of comprehensive information on service costs. Complicating the situation is the diversity of institutions involved in supplying services, including state and local governments as well as cooperative, volunteer, and private enterprises. In the aggregate, several millions of dollars in state and local funds will have to be expended over the course of the construction phase, and probably several hundreds of thousands of dollars per year thereafter to accommodate population changes induced by the El Paso Alaska Project. Organization and incorporation of boroughs and communities along the pipeline route will enhance their ability to develop resources to deal with pipeline impacts.

### 3.2.3 South Coastal Study Area

The majority of the socioeconomic impacts of T-AGP are expected to occur in the South Coastal Study Area, with the Anchorage area being the primary focus of induced changes. The Cordova area, due to its proximity to the marine terminal and LNG plant site, and its facilities

TABLE 17

[Table 3A.3-10 (Revised July 1975)]

PROJECTED SCHOOL POPULATION, FAIRBANKS, 1977-1982
(Thousands)

| | Year | | | | | |
|---|---|---|---|---|---|---|
| | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 |
| With T-AGP | 17.7 | 18.7 | 19.3 | 19.4 | 19.5 | 19.5 |
| Without T-AGP | 17.7 | 18.1 | 18.3 | 18.4 | 18.5 | 18.7 |
| Increment Due to T-AGP | 0 | 0.6 | 1.0 | 1.0 | 1.0 | 0.8 |

Source: Derived from Table 11 on basis of the assumption that the population 6-18 years of age is 24.7 percent of total population.

TABLE 18

[Table 3A.3-11 (Revised July 1975)]

STAFF INCREASES FOR FAIRBANKS EDUCATION SYSTEM
DUE TO TRANS-ALASKA GAS PROJECT, 1977-1982

| | Year | | | | | |
|---|---|---|---|---|---|---|
| | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 |
| With T-AGP | 845 | 890 | 920 | 925 | 925 | 930 |
| Without T-AGP | 845 | 860 | 870 | 875 | 880 | 890 |
| Increment Due To T-AGP | 0 | 30 | 50 | 50 | 45 | 40 |

Source: Derived from Table 17 on basis of ratio of 21 school age persons per staff person.

for transshipping air and waterborne traffic between the site and other points, is the object of great interest as urban and industrial growth forces, generated by the project, impact upon a social and economic structure hitherto oriented primarily to fishing and tourism.

Recalculation of construction manpower requirements and population changes had the effect of reducing the estimated overall size of the work force; but, at the same time, it shifted workers (and therefore dependents and induced population increases) from the Interior to the South Coastal Study Area. As a result, the revised population changes projected for the area as a whole do not differ greatly from those reported in the Environmental Report of the Application.[35/]

The revised projection of population and population changes in the South Coastal Area as a whole and in the Anchorage and Cordova-McCarthy Census Divisions are shown in Table 19. At the peak of population growth in 1980, the population increment attributable to T-AGP in the South Coastal Study Area will be higher by some 5,300 persons than was originally projected. The difference for the Anchorage area, which peaks in 1981, is on the order of 8,600 persons. The Cordova-McCarthy Census Division, on the other hand, is expected to experience less change than was originally projected; peak total population is estimated to number about 9,000 in 1979 instead of 10,000 in 1980. The net increase over normal baseline growth is now estimated at 7,100 persons (in 1979) versus 7,400 (in 1980) as originally projected. After completion of construction, the permanent increase in Cordova's population as a result of the project is estimated at about 1,800 persons versus an original projection of 2,500 (1982 total population with the project is now estimated at approximately 4,200 versus an original projection of 5,400).

35/ Op. Cit., Vol. V. p. 3A.4-28. See Figure 2 and Tables 4,5, and 6 for comparisons of original and revised area projections.

TABLE 19

[Table 3A.4-6 (Revised July 1975)]

PROJECTED POPULATION IN SOUTH COASTAL STUDY AREA CENSUS DIVISIONS, 1977-1983
(Thousands of Persons)

| Location | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 |
|---|---|---|---|---|---|---|---|
| South Coastal Study Area | | | | | | | |
| With T-AGP | 233.2 | 252.0 | 276.7 | 292.8 | 291.9 | 288.4 | 293.8 |
| Without T-AGP | 232.9 | 237.3 | 240.3 | 241.3 | 242.7 | 246.2 | 251.6 |
| Increment due to T-AGP | 0.3 | 14.7 | 36.4 | 51.5 | 49.2 | 42.2 | 42.2 |
| Anchorage Census Division | | | | | | | |
| With T-AGP | 226.7 | 239.1 | 262.0 | 279.9 | 282.3 | 278.8 | 284.0 |
| Without T-AGP | 225.8 | 230.1 | 233.0 | 233.9 | 235.3 | 238.7 | 243.9 |
| Increment due to T-AGP | 0.9 | 9.0 | 29.0 | 46.0 | 47.0 | 40.1 | 40.1 |
| Cordova-McCarthy Census Division | | | | | | | |
| With T-AGP | 2.4 | 6.8 | 9.1 | 7.5 | 4.2 | 4.1 | 4.2 |
| Without T-AGP | 2.0 | 2.0 | 2.0 | 2.1 | 2.2 | 2.3 | 2.4 |
| Increment due to T-AGP | 0.4 | 4.8 | 7.1 | 5.4 | 2.0 | 1.8 | 1.8 |

Source: Tables 3A.3-7 and 3A.3-8 (Revised - see Appendix C).

Projected changes in employment in the South Coastal Study Area and in the Anchorage and Cordova-Valdez areas have also been revised. The current estimates are presented in Table 20. Statewide population projections were based on observed relationships in the operation of the HRPI/URSA economic base model; once the adjusted projections of total population were allocated to study areas, civilian employment levels were derived on the basis of typical participation and unemployment rates.[36/] Subtraction of project direct employment from these total employment levels yielded the induced component.

Underlying the projected changes in population and employment are the resources both consumed and generated by the El Paso Alaska project itself. A summary of the T-AGP characteristics in the South Coastal Study Area is provided in Table 21. The principal revisions in this table relate to construction labor costs and manpower peaks which are increased in the case of the southern segment of the pipeline. The manpower peak is substantially reduced in the case of the LNG plant.

### 3.2.3.1 Income and Spending

The T-AGP was originally projected to generate about $340 million in direct wages for construction activities in the South Coastal Study Area during 1977-1981, and about $7.8 million per year thereafter in operating personnel salaries and wages.[37/] After allowing for taxes and spending outside the state and taking into account the 1.5 income multiplier, the impact of the project activities within the Area was estimated to amount to a $200 million increase in area income during construction and $9.4 million thereafter.

36/ See Appendix A.

37/ Application, Vol. V, p. 3A.4-35.

TABLE 20

[Table 3A.4-10 (Revised July 1975)]

PROJECTED CIVILIAN EMPLOYMENT, SOUTH COASTAL STUDY AREA CENSUS DIVISIONS, 1977-1982
(Mid-Year, in Thousands of Workers)

| Location | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 |
|---|---|---|---|---|---|---|
| Baseline Employment[1/] | | | | | | |
| Cordova-Valdez[2/] | 2.8 | 2.8 | 2.9 | 2.9 | 2.9 | 2.9 |
| Anchorage | 88.6 | 90.3 | 91.4 | 91.8 | 92.3 | 93.7 |
| Subtotal | 91.4 | 93.1 | 94.3 | 94.7 | 95.2 | 96.6 |
| Incremental Employment | | | | | | |
| Direct | 0.3 | 3.1 | 4.0 | 2.6 | 1.1 | 0.4[4/] |
| Induced[3/] | 1.0 | 3.4 | 12.0 | 20.2 | 20.9 | 18.6 |
| Subtotal | 1.3 | 6.5 | 16.0 | 22.8 | 22.0 | 19.0 |
| Total | 92.7 | 99.6 | 110.3 | 117.5 | 117.2 | 115.6 |

1/ Based on estimated study area share of projected total state employment civilian labor force, as derived from HRPI/URSA, 1974, Appendix Table B-18, and from population projections in Table 19.

2/ Valdez portion consists of 60 percent of total projected Valdez-Chitina-Whittier employed. Employed populations assumed to be the same proportion of South Coastal Study Area employed as subarea populations to total area populations (see Table 19).

3/ Estimated based on difference between baseline employment trend plus direct pipeline employment subtracted from projected study area employed labor force. Thus, induced component includes exogenous growth factors after peak of direct employment is reached.

4/ Operating personnel.

TABLE 21

[Table 3A.4-5 (Revised July 1975)]

PRINCIPAL PROJECT CONSTRUCTION AND OPERATION CHARACTERISTICS, SOUTH COASTAL STUDY AREA

| | |
|---|---|
| **Pipeline** | |
| Length of pipeline | 54.7 miles |
| Number of compressor stations | 0 |
| Number of maintenance bases | 1 |
| Estimated capital costs | $ 131.3 million 1/ |
| Estimated construction labor costs | $ 126.6 million 2/ |
| Estimated maximum construction labor force (1978-79) | 1,300 +- 3/ |
| Estimated annual operating costs | $ 4.7 million 4/ |
| Estimated annual operating payroll (78 men) | $ 1.4 million 2/ |
| Estimated annual ad valorem property taxes | $ 2.6 million 7/ |
| **LNG Plant** | |
| Estimated capital costs | $1,626.8 million 5/ |
| Estimated construction labor costs | $ 307.9 million 4/ |
| Estimated maximum construction labor force (1979) | 4,100 +- 3/ |
| Estimated annual operating costs | $ 127.8 million 4/ |
| Estimated annual operating payroll (309 men) | $ 5.4 million 6/ |
| Estimated annual ad valorem property taxes | $ 32.5 million 7/ |
| **Marine Terminal** | |
| Estimated capital costs | $ 58.5 million 5/ |
| Estimated construction labor costs | $ 5.6 million 4/ |
| Estimated maximum construction labor force (1978-79) | 120 3/ |
| Estimated annual operating costs | $ 1.5 million 4/ |
| Estimated annual fleet support payroll (47 men) | $ 1.2 million 6/ |
| Estimated annual ad valorem property taxes | $ 1.2 million 7/ |
| **Summary** | |
| Total estimated capital cost | $1,816.6 million |
| Total estimated construction labor cost | $ 440.1 million |
| Total estimated annual operating cost | $ 134.0 million |
| Total estimated annual operating payroll (474 men) | $ 8.0 million |
| Total estimated annual ad valorem property taxes | $ 36.3 million |

Sources:

1/ El Paso Alaska's Direct Testimony and Proposed Hearing Exhibits Vol. III of V, dated 3/24/75, at Docket Nos. CP75-96 et al, Exhibit EP-58, (CRJ-2), Schedule 2, Sheet 4 of 4.

2/ South Coastal Area work force proportionate share of total pipeline labor costs (exclusive of home office administrative and general support expense), per Application (9/24/74), Vol. II, p. 2.3-2.

3/ Response 118, (see Appendix B).

4/ Based upon tax rate of 20 mills applied to estimated capital costs.

5/ Exhibit EP-58 (see footnote 1) Schedule 3, Sheet 4 of 4.

6/ Application, Vol. II, pp. 4.3-8, 5.3-10.

7/ Based upon tax rate of 20 mils applied to estimated capital costs.

With recalculations of project manpower requirements and population changes (including consideration of spending by dependents of Interior and Arctic Study Area project personnel living in the South Coastal Study Area), the following income and spending estimates result:[38/]

| | Project Phase | |
|---|---|---|
| | Construction (1977-1981) | Operating (Annual) |
| T-AGP wages and salaries in area | $440 million | $8.0 million/yr. |
| Total direct and induced spending including dependents of Interior and Arctic Area personnel | $230 million | $7.8 million/yr. |
| (Anchorage) | ($142.4 million) | ($3.5 million/yr.) |
| (Cordova) | ($ 62.7 million) | ($3.7 million/yr.) |
| (Other Impact Areas) | ($ 24.9 million) | ($0.6 million/yr.) |

These estimates do not take into account purchases of local goods and services by the project itself. Since local procurements are likely to be significant, they should further stimulate local businesses amd be a source of sales taxes for local jurisdictions.

### 3.2.3.2 Housing

Housing requirements have been reestimated to take into account the recalculation of construction manpower requirements and population changes. The effect has been to increase the estimated peak number of additional (i.e., beyond normal growth requirements) housing units in the Anchorage area from 12,500 units in 1980 to 15,200 units in 1981. On the other hand, the maximum incremental number of units in the Cordova area is reduced from 2,500 units in 1980 to 2,300 units in 1979. The revised projections of housing needs are presented in Table 22.

38/ Response #152 (See Appendix B).

TABLE 22

[Table 3A.4-7 (Revised July 1975)]

PROJECTED HOUSING NEEDS IN SOUTH COASTAL STUDY AREA, 1977-1982
(Thousands of Units)

| Location / Census Division | Year | | | | | |
|---|---|---|---|---|---|---|
| | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 |
| Anchorage[1/] | | | | | | |
| With T-AGP | 73.1 | 77.1 | 84.5 | 90.3 | 91.1 | 89.9 |
| Without T-AGP | 72.8 | 74.2 | 75.2 | 75.5 | 75.9 | 77.0 |
| Increment due to T-AGP | 0.3 | 2.9 | 9.3 | 14.8 | 15.2 | 12.9 |
| Cordova-McCarthy[2/] | | | | | | |
| With T-AGP[3/] | 0.8 | 2.3 | 3.0 | 2.5 | 1.5 | 1.4 |
| Without T-AGP | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.8 |
| Increment due to T-AGP | 0.1 | 1.6 | 2.3 | 1.8 | 0.8 | 0.6 |

Source: Derived from Table 19.

1/ 3.1 persons per housing unit in Anchorage.
2/ 3.0 persons per housing unit in Cordova.
3/ Includes approximately 100 units for on-duty operating personnel whose households are assumed to be in Anchorage.

CORDOVA

Housing shortages attributable to T-AGP in the Anchorage and Valdez areas will not likely be very serious. This belief stems from the expectation that the Alyeska project will have stimulated a substantial expansion in numbers of housing units. As the Alyeska project winds down, housing will become available for El Paso Alaska personnel and their dependents. In addition, many ex-Alyeska workers who are residents of Alaska will not need new housing if they are employed by the El Paso Alaska project.

The Cordova area will not develop a surplus of housing as a result of the Alyeska project, although some growth is virtually certain when the Copper River Highway is completed in the early 1980's, making the city another port serving the Interior. Offshore oil development would also stimulate expansion of housing and services. All available housing as well as public utility, police, fire, health and school facilities were reportedly being used to capacity in 1973.[39/] Since then, however, Cordova has undertaken a substantial planning program and is already providing expanded services in anticipation of growth. A two million dollar bond issue has recently been passed to provide additional police and fire protection; the sewer system and water treatment plant is more than adequate for the present, and provision for further expansion has been provided. Similarly, water and electrical utilities are being developed for a growing population. It is thus in a greatly improved position to provide services and amenities as the community grows. Some land for hosuing development is available within city limits. High rise structures appear to be the main in-town alternative; there is considerable underdeveloped land east of the city towards the airport. However, public utility services will need to be provided.

39/ Alaska State Legislature, Special Petroleum Impact Committee, "Report on Impact of Trans-Alaska [Oil] Pipeline Construction on Governmental Services and Facilities," (Juneau, Feb. 12, 1974), pp. 86-88.

While El Paso Alaska will provide 65 units at the LNG plant site, housing needs in the Cordova area are projected to more than treble between 1977 and 1979, and there will be an urgent need to provide both temporary and permanent housing and utility services during the construction phase. By 1982, total housing needs in Cordova are projected to decline to about 1400 units. As is evident, the sharp decline in numbers of housing units required from the peak of construction to 1982 will necessitate careful planning and management of housing developments and public services to avoid waste and to minimize disturbance of resources and aesthetic values.

### 3.2.3.3 Public Service Costs & Revenues

Changes in population will lead to changes in levels of service by borough and municipal governments, with corresponding changes in operating costs. The methods employed to derive the estimates are described in some detail in Appendix A. In the following pages, which conclude Section 3, the cost and revenue changes projected for the Anchorage, Cordova and Valdez, and other impact areas, are described. The revised estimates of local cost and revenue characteristics for the major categories of public services are included in Table 16.

## Anchorage

During the construction period (1977-1981) the population of the Greater Anchorage Area Borough (GAAB) is projected to increase as much as 20 percent, approximately 45,000 over baseline. The GAAB is expected to receive almost half of the state's population increase attributable to the El Paso Alaska project and therefore, a similar portion of other impacts. Gross impact costs of public service operations for the GAAB during the construction period will amount to roughly $55 million (see Table 16). Impact revenues gained as a result of the project (about $50 million) will offset all but an estimated $5 million -- the net impact cost. Education costs during the 1977-1981 period (at an estimated $44 million) comprise the bulk of the impact costs. The City of Anchorage will incur its most substantial cost increases from public safety operations (over $9 million). Gross impact costs for the city are estimated at $13.5 million during the construction period. Impact revenues will account for about $12 million of the costs, leaving a deficit of less than $1.5 million during the construction period.

The long-term (post-construction) population increase in the Anchorage Borough is projected to reach 40,000 over baseline (an increase of 17 percent). It is assumed that half the households of the operating personnel associated with the pipeline will be located in Anchorage. The incremental population from project construction and operation will incur additional public service costs of approximately $17 million for the borough (including schools) and $4 million for the city each year. After the construction period when the economy again stabilizes, the ordinary tax revenues of the borough and city are projected to increase correspondingly and absorb the cost increases.

Educational costs in the GAAB will rise due to additional school age children being introduced to the system by families attracted to the area. An estimate of changes in the school age population in the Anchorage and Cordova areas is provided in Table 23. Corresponding

TABLE 23

[Table 3A.4-8 (Revised July 1975)]

INCREASED SCHOOL AGE POPULATION IN SOUTH COASTAL STUDY AREA, 1977-1982

| Location / Census Division | Year | | | | | |
|---|---|---|---|---|---|---|
| | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 |
| Anchorage[1/] | | | | | | |
| With T-AGP | 63.9 | 67.4 | 73.9 | 78.9 | 79.6 | 78.6 |
| Without T-AGP | 63.6 | 64.8 | 65.6 | 65.9 | 66.3 | 67.2 |
| Increment due to T-AGP | 0.3 | 2.6 | 8.3 | 13.0 | 13.3 | 11.4 |
| Cordova-McCarthy[2/] | | | | | | |
| With T-AGP | 0.7 | 1.9 | 2.5 | 2.1 | 1.2 | 1.1 |
| Without T-AGP | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 |
| Increment due to T-AGP | 0.1 | 1.3 | 1.9 | 1.5 | 0.6 | 0.5 |

Source: Derived from Table 19.

1/ Anchorage population 6-18 = 28.2%.
2/ Cordova population 6-18 = 28.0%

increases in education staffing requirements are projected in Table 24. The magnitude of the increases at the time of peak change is on the order of 20 percent over baseline.

Additional law enforcement personnel will be needed in the Anchorage area because of the expanded population. Assuming that population growth in the Anchorage area due to the T-AGP is divided approximately equally between the city and the rest of the Greater Anchorage Area Borough (as the Borough projects will be the case with population growth induced by the Alyeska project), then at peak growth in 1981 each area will require approximately 40 additional personnel. This number is based on a ratio of 500 residents per police officer.[40/]

Cordova

Cordova will experience the most significant population increase, proportionally, during the T-AGP construction period. During the peak construction year (1979) the average population is expected to triple from its 1977 preproject level of about 3,000 residents to approximately 9,000 inhabitants. During the construction period (1977-1981) Cordova will incur gross impact costs estimated at over $7 million.[41/] Costs of operating expanded road, water and sewage systems to accommodate the large population increase will comprise a substantial portion (nearly $2 million) of these costs. Education costs (estimated at $1.5 million), general government (nearly $1.5 million), and public safety (over $1 million) are almost as significant (see Table 16).

Between 1977 and 1981, increased revenues from existing tax sources will cover an estimated $4.3 million of the gross operating costs. Over the five year construction period, the deficit of at least $2.7 million must be made up from outside funding. Substantial capital investments will be required to increase system capacities.

40/ See Response #164, Table 164-B, in Appendix B.

41/ Aggregate costs of operation over the 5-year period.

TABLE 24

[Table 3A.4-9 (Revised July 1975)]

PROJECTED STAFF INCREASES FOR ANCHORAGE AND CORDOVA EDUCATION SYSTEMS, 1977-1982[1/]

| Place | Year | | | | | |
|---|---|---|---|---|---|---|
| | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 |
| Anchorage | | | | | | |
| With T-AGP | 3,045 | 3,210 | 3,520 | 3,755 | 3,790 | 3,745 |
| Without T-AGP | 3,030 | 3,085 | 3,125 | 3,140 | 3,155 | 3,200 |
| Increment due to T-AGP | 15 | 125 | 395 | 615 | 635 | 545 |
| Cordova-McCarthy | | | | | | |
| With T-AGP | 35 | 90 | 120 | 100 | 55 | 50 |
| Without T-AGP | 30 | 30 | 30 | 30 | 30 | 30 |
| Increment due to T-AGP | 5 | 60 | 90 | 70 | 25 | 20 |

Source: Derived from Table 23.

1/ Assumes approximately 21 students per staff member.

The long-term population increase attributable to project operations will be about 1800 inhabitants. The LNG plant and marine terminal will employ about 350 operating personnel, 65 of whom will live on Gravina Point. Additional public service operating costs due to the population increase in Cordova attributable to the project may average around one million dollars annually with a corresponding increase in the town's revenues offsetting the incremental costs.

Tables 23 and 24 include estimates of changes in school age population and school staffing in the Cordova area. The Cordova School District has supported the preparation of an in-depth study of education plant requirements with and without the T-AGP.[42/] The student and staff projections in Tables 23 and 24 are believed to be generally consistent with the District's findings, namely, that the Cordova area will need a second elementary school and additional temporary classrooms at the new elementary school, the middle school and the high school. These facilities, estimated to require approximately $1 million in capital outlays, would supplement improvements already needed for existing classrooms, programs and service facilities.

While the state subsidizes a major portion of educational and other public service operating expenses, project-induced increase in demands for additional services and facilities will strain the community's fiscal resources and management capabilities. In any case, able planning and management of residential and commercial growth, traffic and civic amenities are ultimately as crucial to the preservation of local values as are ample funds.

42/ Bureau of School Services, University of Arizona, "Cordova Alaska School Study" (undated).

Other Impact Areas

Table 16 includes public service costs for impact areas not included in the Anchorage, Fairbanks and Cordova areas. This category roughly includes the area outside Fairbanks (included in the impact discussion of the Interior Area)[43/] and Valdez. These areas will experience population increases totaling about 2,500 during the construction period and will incur an estimated $4.6 million in public service operating costs. Increased revenues in these areas are projected to account for $3.6 million ($1.5 million in Valdez) leaving slightly less than $1 million in deficits to be covered by the State during the construction period. Valdez is projected to account for roughly $400,000 of the gross operating deficits.

Valdez will have undergone considerable growth during the Alyeska Project and is expected to receive part of the impact population resulting from the El Paso Alaska project. Consequently, it will incur some incremental public service costs. During the operating period, 1982 and beyond, additional costs for Valdez are estimated at $400,000 annually. Revenues, as is the case for the other impact areas, are projected to increase correspondingly to absorb the additional costs.

43/ Including such communities as Gulkana, Glennallen and Delta Junction.

## 4.0 An Overview of Socioeconomic Impacts

### 4.1 General Observations

Quantitative analyses of the prospective population, employment and public sector service and financial impacts of the Trans-Alaska Gas Project have been presented in the preceding sections. Significant changes from earlier analyses resulted from El Paso Alaska's revised construction manpower requirements and from an updated estimate of baseline socioeconomic characteristics as they likely will be when T-AGP construction begins. The effect is a substantial reduction, from earlier estimates, of the impacts attributable to T-AGP on the Fairbanks and Cordova areas while those on the Anchorage area are projected to increase slightly.

In addition, the estimates of impacts attributable to T-AGP on the public finances of state and local governments were revised to take account of recent data and to refine the estimates by distinguishing impact-induced changes in operating costs from requirements for capital improvements. The revisions have served to make somewhat more precise the projections of long-term fiscal surpluses (although the distribution of costs and revenues remains very unequal as between the local jurisdictions and the state government). The temporary shortfall between revenues and expenses at the local level is properly the province of special impact funding from the State, such as has been undertaken already by the Governor's office and legislature for the Alyeska project. Transfer mechanisms will need to be constantly upgraded to ensure that communities not having taxing power over pipeline properties can adequately deal with project-induced changes.

No estimate is made of impact-induced capital expenditures, primarily because of the belief that facility expansion triggered by the Alyeska project would likely accommodate much of the need caused by the El Paso Alaska project. In instances where additional facilities might be needed, the question is not one of whether current revenues are

adequate, but whether the jurisdiction's borrowing capacity is adequate. Guarantees and assistance with debt service capability, at least temporarily until local pipeline property taxes begin accruing, might properly be provided by the State from bonus payments or other sources of funds.

In cases where a local jurisdiction's ability to service long-term debt is impaired by inadequate taxes or property base, the State may find it necessary to provide capital funds or to guarantee bonded debt until the jurisdiction's resources are adequate to meet its long-term needs. The Special Legislative Pipeline Impact Committee which studied local government funding needs in 1974 received requests for capital spending support totaling more than $70 million. The Committee recommended $57.9 million,[44/] but the impact grants eventually passed, as mentioned earlier, made only small provision for capital improvements.

The observation is made that the Trans-Alaska Oil Pipeline and the Trans-Alaska Gas Project in the final analysis are accelerating the growth of the state, compressing the time horizon for expansion of public service facilities. Neither Alyeska nor El Paso Alaska should bear the full cost of expansion for facilities whose useful lives extend well beyond the construction phases of the two projects. The tax revenues to be generated by the two projects can be the basis for a substantial expansion of local and state government borrowing capability in advance of pipeline operations. It remains for the state and local governments to maintain close communication and coordination of efforts so that capital program development and implementation can keep ahead of local needs.

44/ Op. Cit. p. 16.

The question remains, however, whether the proposed T-AGP, taking into account the revisions in projected socioeconomic impacts, will on balance benefit or penalize Alaska and its residents. This question has been posed in many forums; this analysis supports the conclusion that the project will benefit both Alaska and the nation as a whole. Alaska will benefit financially from the Trans-Alaska Gas Project. As was shown in Section 2 (see Table 3), revenues accruing to the state government as a result of the project will exceed increased public service costs throughout the life of the project. And, more importantly, because of their improved financial position, the state and local governments will have additional resources for upgrading and expanding public goods and services required by the residents.

Yet, there are several reasons why a cost accounting procedure is inadequate for evaluation of the overall net impact (fiscal and non-fiscal) of the T-AGP on Alaska.

1. Many effects of the project can be entered on either side of the ledger, depending upon the personal values of the accountant. While some effects of the project will be clearly positive (availability of natural gas to Interior Alaska customers) and some clearly negative (scenic degradation), others are ambiguous.
2. The magnitude of many impacts cannot be calculated at the present time. Although these impacts are quantifiable, they are not presently measurable.
3. Many of the impacts are unquantifiable, and qualitative judgments about their magnitude are entirely subjective. For example, degradation of the scenic beauty of Prince William Sound is very serious to some people and insignificant to others.

The Alyeska project has already initiated great changes, and the El Paso Alaska project, while substantially smaller than Alyeska in terms of manpower needs, expenditure of dollars, and alteration of land resources, will cause further changes. Anchorage, Fairbanks, and Valdez

are already experiencing extensive changes in population, attitudes and appearance as thousands of new people pour in to participate in the Alyeska boom, and for small communities along the pipeline route, and particularly the town of Cordova, the ambience of a lifestyle oriented strongly to hunting, fishing and tourism will be further modified.

Changes in lifestyle cannot be assessed objectively. In the end, the normative judgment must be made whether most of the persons affected are at least materially better off than before. The T-AGP will benefit Alaska because it facilitates development of a valued resource, and in the process creates a large amount of employment.

It should be noted that the El Paso Alaska project will ease the adjustment of the Alaskan economy to the changes initiated by the Alyeska project; without the "stretching-out" of employment on pipeline construction, the state probably will have to cope with several years of higher than normal levels of unemployment and welfare claims once Alyeska's work force peak is passed. The lesser manpower requirements of T-AGP coming after the Alyeska project, together with additional tax revenues generated by the project, will serve to expand the state's ability to absorb the impacts of both pipeline projects.

## 4.2 Specific Concerns

Of all communities to be affected by T-AGP, Cordova will be subjected to the greatest pressures, relatively. Other communities - Anchorage, Fairbanks, Valdez, and the many smaller communities along the pipeline corridor - will already have experienced the impacts of the Alyeska project, and those of T-AGP will be an extension that, in the main, bridges the downturn in Alyeska activity and eases the transition back to "normal" conditions. A trebling of population in Cordova within one or two years is bound to produce fundamental changes in the community not only because of sheer quantitative changes, but also because of the qualitative differences among people. While many of the newcomers will be Alaskan residents relocating from Anchorage or other parts of

the state, some will be newly arrived from the Lower 48, with different attitudes and expectations compared to the Alaskan residents.

The Trans-Alaska Gas Project will not be the only factor bringing change to the area, however. If offshore oil leasing in Prince William Sound goes forward, exploration companies will require greatly expanded shore support facilities and personnel, and Cordova is ideally situated for such purposes. Tourism potentials are great in the Cordova area and in the Copper River Valley. Completion of the Copper River Highway will undoubtedly bring more visitors into the area, augmenting those presently arriving by air. Also, the port of Cordova will serve as an alternative to Valdez and Anchorage as a trans-shipment point for barged container truck traffic moving to Fairbanks and the Interior. Thus, it is not only uncertain, but also, unrealistic to consider the impacts of the T-AGP in isolation.

As a practical matter, however, lack of specific information on future plans makes it necessary to assess the impacts of the project on Cordova as if there will be no other significant growth factors operating during the construction and initial operating phases of the LNG plant and marine terminal. Conservative practice dictates that the socioeconomic baseline for comparison of project impacts be an extrapolation of recent trends. The result is to show a relatively large build-up of population during the major construction period followed by a marked downturn and stabilization. It is more likely, however, that the baseline trend will not continue unchanged. More likely, it will be an acceleration of growth. The completion of the Copper River Highway and offshore oil leasing could occur at a time such that their resulting population impacts coincided with, or followed behind those of the El Paso Alaska LNG plant. The cumulative impacts of the various projects on the community could be quite distinct in character, one from another. Common to all possibilities is an upward trend in population, however.

The following facts seem clear with respect to Cordova's future:

1. Growth is coming to the Cordova area; the only uncertainties are the timing and the magnitude of growth forces.
2. Suitable building sites within the city's present boundaries for extensive expansion of housing are somewhat limited; the alternatives are (a) multi-story structures, or (b) development of new residential areas outside of town. The alternative of no growth does not appear practical.
3. The El Paso Alaska project, while not necessarily the only activity that could generate large socioeconomic impacts in the Cordova area in the near future, would almost certainly be among the largest.

Taking the worst case scenario, namely that the El Paso Alaska project would be the only major factor in Cordova's near term development, then the risk exists that Cordova might acquire facilities and obligations that it could not support. To avoid such an adverse impact, the city and state need to plan for temporary and portable public service facilities while establishing controls over housing and commercial development. The controls should be designed to prevent unrestricted proliferation of temporary housing and mobile homes without adequate building safety features or waste disposal facilities, for example. Zoning and building codes would need to be adopted and areas of jurisdiction would need to be expanded. The City of Cordova is now well along in its planning for future growth (see Section 3).

The present experience of Valdez should be closely studied for guildelines to policies and planning in Cordova. Few opportunities exist in city planning for one community to observe how a neighbor with many similarities deals with a major project.

It is recognized that large amounts of money will be needed to accommodate the impacts of the Trans-Alaska Gas Project. The tax system will generate the funds; the crucial question is how effectively the fiscal resources will be managed.

El Paso Alaska acknowledges the magnitude of the impacts of its proposal in terms of both real and financial costs, and recognizes its obligation to provide the resources through the tax system to compensate for the costs. At the same time, El Paso Alaska stresses the utility and benefits of the gas transportation service it will provide, both to users in the state, through making gas available to residents and business along the route,[45/] and to the nation as a whole, as it strives for energy independence.

45/ El Paso Alaska Company, Preliminary Survey: The Potential Market in Alaska for North Slope Natural Gas (March 1975).

A

ALPHABETICAL - CERTIFICATE INDEX

APPENDIX A

ANALYTICAL METHODOLOGY

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ANALYTICAL METHODOLOGY

Population and Employment

The point of departure for the revised projections of employment and population is the HRPI/URSA, November 1974, study of potential pipeline impacts, and the revised estimates of El Paso Alaska's construction manpower requirements. The HRPI/URSA study provides a systematic analysis of economic interrelationships in Alaska, and serves as a basis for developing a set of projections of the incremental effects of the El Paso Alaska project coming on the heels of the Alyeska project. The HRPI/URSA study is based on a multi-sectoral economic base model of the state economy which incorporates, among various features, a system of lagged relationships in its equations for projecting changes in population and employment in certain sectors.[1/] Analysis of the output of the model as it operated under various assumptions led to the determination of a number of relationships between pipeline construction employment and population changes which were applied to the El Paso Alaska project's manpower requirements.

The distribution of employment among the various sectors of the economy and various trades and professions was very stable until the advent of the Alyeska project. The HRPI/URSA model indicated that some shifts would take place with Alyeska construction underway. The most significant change was the apparently permanent[2/] increase in the share of total employment accounted for by the construction sector. Specifically, whereas until 1974 the construction sector employed on the order

1/ The model is fully described in the first HRPI report (April 1974) in Vol. 2, which comprises a technical discussion of the research methodology: HRPI, A Forecast of Industry and Occupational Employment in the State of Alaska, Vol. 2, "The Structure of Alaska's Labor Market."

2/ At least for the duration of the HRPI/URSA analysis period, namely through 1980.

of 6.1 to 6.3 percent of the employed population (excluding military), after completion of the Alyeska project the share would tend to stabilize -- at least for a few years -- in the range of 7.0 to 7.4 percent. Analysis of the HRPI/URSA projections indicated that the share of non-pipeline employment would rise rapidly from 6.2 percent in 1974 to 7.1 percent in 1977 and then slow to a very gradual rate of increase. Observing that tendency led to the development of estimates of increases in non-pipeline construction employment stimulated by the Trans-Alaska Gas Project. The induced increases in non-pipeline employment (which during construction of T-AGP are assumed to be relatively permanent, as are those projected for Alyeska in the HRPI/URSA study), are in turn assumed to be the basis for a further increase in the share of non-pipeline employment in total employment. Analysis of the HRPI/URSA "high" estimate (i.e., including a Trans-Alaska Gas Project) indicated that the construction sector's share of total employment would increase to a level of 7.5 or 7.6 percent by the end of the construction phase. Once the construction sector employment numbers and shares were obtained, it was possible to derive estimates of total employment, and with reasonable allowances for unemployment rates, worker dependency ratios, and military personnel, estimates of total population.

The computations for population projections with and without T-AGP are contained in Table A-1. To preserve consistency of methodology in adapting the HRPI/URSA model output to El Paso Alaska's manpower requirements, the revised computations in Table A-1 use the same unemployment and civilian dependency factors and the same estimated military population used by HRPI/URSA in its "high" case up to 1980 (the latest year in their series). With the winding down of T-AGP construction in 1980 and 1981, the economy is expected to stabilize by 1982 with such parameters as construction employment share of total employment, unemployment rate, and civilian dependency ratio taking on constant values.

TABLE A-1

[Table 3A.2-2 (Rev. 2, 6/30/75)]

PROJECTED EMPLOYMENT AND POPULATION IMPACTS OF THE TRANS-ALASKA GAS PROJECT, 1974-1983[1/]

| Year | Long-Term Construction Employment Baseline | Percent Total Employed | Total Employed | Unemployment Rate [2/] | Civilian Labor Force | Civilian Dependency Ratio [2/] | Military Population | Total Population |
|---|---|---|---|---|---|---|---|---|
| 1974 | 8,200 | 6.18% | 132,700 | 10.60% | 148,400 | 2.00 | 57,900 | 354,900 |
| 1975 | 10,100 | 6.31% | 160,200 | 11.50% | 181,000 | 1.98 | 57,600 | 415,500 |
| 1976 | 11,800 | 6.68% | 176,700 | 12.50% | 201,900 | 1.98 | 57,300 | 456,400 |
| 1977 | 12,900 | 7.09% | 182,100 | 13.10% | 210,000 | 1.99 | 57,200 | 474,200 |
| 1978 | 13,500 | 6.96% | 194,100 | 13.00% | 223,100 | 1.98 | 57,200 | 495,900 |
| (*) | (13,200) | (7.00%) | (188,600) | (12.00%) | (214,300) | -- | -- | (481,500) |
| 1979 | 15,000 | 7.30% | 205,500 | 13.00% | 236,200 | 1.98 | 57,100 | 524,800 |
| (*) | (13,600) | (7.10%) | (191,500) | (12.00%) | (217,600) | -- | -- | (488,100) |
| 1980 | 16,000 | 7.40% | 216,200 | 12.00% | 245,700 | 1.98 | 57,000 | 543,500 |
| (*) | (14,000) | (7.20%) | (194,400) | (11.00%) | (218,500) | -- | -- | (489,600) |
| 1981 | 16,400 | 7.50% | 218,700 | 11.00% | 245,700 | 1.99 | 57,000 | 545,900 |
| (*) | (14,400) | (7.30%) | (197,300) | (10.00%) | (219,200) | -- | -- | (493,200) |
| 1982 | 16,800 | 7.60% | 221,000 | 10.00% | 245,600 | 1.99 | 57,000 | 545,700 |
| (*) | (14,800) | (7.40%) | (200,000) | (10.00%) | (222,200) | -- | -- | (500,000) |
| 1983 | 17,200 | 7.60% | 226,300 | 10.00% | 251,500 | 1.99 | 57,000 | 557,400 |
| (*) | (15,200) | (7.40%) | (205,400) | (10.00%) | (228,200) | -- | -- | (511,200) |

(*) Without Trans-Alaska Gas Project (Alyeska project only).

1/ 1977-74 per HRPI/URSA (11/74, Appendix Tables B-14 through B-18).
1978-83 estimates based on HRPI/URSA trends and El Paso Alaska projected manpower requirements.

2/ Percentage rounded to nearest hundredth; calculations based on original data.

As is evident, the potential margin of error on these projections is wide. They are necessarily based upon numerous assumptions, simply because there are no precedents in Alaska's economic history for estimating socioeconomic changes in the state on the scale of those to be induced by the Alyeska and El Paso Alaska projects. Socioeconomic changes are inferred from calculations of the economy's response to changes in demands for various types of labor inputs, with the critical assumption (as explicitly expressed by HRPI in its methodological discussion) that economic relationships among the various sectors of the economy remain essentially constant.[3/] Quantities of labor, capital, and materials consumed increase, but the proportions remain more or less constant in the model.

A second potential source of error in this analysis arises from the sensitivity of changes in total employment and population to small variations in the percentage of total employment accounted for by the construction sector. For example, a difference of 0.1 percentage point in the construction sector's estimated share of total employment (Column 3, Table A-1) can produce a change in total population of 6,000 to 7,000 persons. Without access to the HRPI/URSA computer model, the only alternative was to observe and analyze the behavior of the model's output and to develop approximations of what the model would produce using El Paso Alaska's data on project manpower requirements. Rather more confidence can be placed in the estimates of relative differences between population projections with and without T-AGP than in the projected absolute levels of employment and population. By no means should projected values be assumed to be precise. Rather, they should be considered as an approximate mid-point of a range of values extending at least 10 to 20 percent above and below the indicated value.

3/ HRPI, April 1974, Vol. II, p.16.

The calculations of the construction sector employment baseline involved three steps: (1) projection of sectorial employment assuming that neither the Alyeska nor El Paso Alaska projects took place; (2) modification of the baseline to reflect the impact of the Alyeska project on long-term construction employment; and (3) modification of the adjusted baseline to reflect the impact on non-pipeline construction employment attributable to the El Paso Alaska project. The calculations are presented in Table A-2.

In Table A-2, the data for the years 1974-1976 have been taken unchanged from the tables in HRPI/URSA for the "high" estimate, and 1977 is virtually identical except for the use of 1200 gas pipeline construction workers instead of 1100, as projected by HRPI/URSA. The lagged response of non-pipeline (long-term) employment (col. 3) is evident. By the fourth year of the Alyeska project (1977) the model projects a 3600-person increase in the long-term construction workforce (cols. 4 and 5). This increment is considered to be permanent owing to the large general stimulus to development in the state by the oil pipeline project.

Beginning in 1977, the Trans-Alaska Gas Project will add a further stimulus to the state's economic growth. Following the lagged relationship between annual changes in pipeline employment and non-pipeline construction employment observed in the HRPI/URSA study, changes in the El Paso Alaska project employment were translated into induced changes in non-pipeline, long-term construction employment. The following tabulation[4/] presents the lagged relationship identified in the HRPI/URSA study:

| Year of Project Construction | Induced Changes in Non-Pipeline Construction Employment |
|---|---|
| 1st | None |
| 2nd | 26 percent of 1st year direct pipeline average employment |

4/ Derived from HRPI/URSA, Appendix Tables B-15 to B-18.

TABLE A-2

[Table 3A.2-1 (Rev. 2, 6/30/75)]

ALASKA PROJECTED CONSTRUCTION EMPLOYMENT TRENDS
(Average Annual Number of Workers, 1973-1983)

| Year | Projected Baseline[1] | Alyeska Employment Direct[2] | Alyeska Employment Induced[3] | Cumulative Alyeska Induced[4] | Adjusted Long-term Baseline[5] | El Paso Alaska Employment Direct[6] | El Paso Alaska Employment Induced[7] | Cumulative El Paso Alaska Induced[8] | Total Long-term Baseline[9] | Total Construction Workers[10] |
|---|---|---|---|---|---|---|---|---|---|---|
| 1973 | 7,900 | 0 | 0 | 0 | 7,900 | 0 | 0 | 0 | 7,900 | 7,900 |
| 1974 | 8,200 | 6,200 | 0 | 0 | 8,200 | 0 | 0 | 0 | 8,200 | 14,400 |
| 1975 | 8,500 | 10,600 | 1,600 | 1,600 | 10,100 | 0 | 0 | 0 | 10,100 | 20,700 |
| 1976 | 8,900 | 9,100 | 1,300 | 2,900 | 11,800 | 0 | 0 | 0 | 11,800 | 20,900 |
| 1977 | 9,300 | 2,000 | 700 | 3,600 | 12,900 | 1,200 | 0 | 0 | 12,900 | 16,100 |
| 1978 | 9,600 | 0 | 0 | 3,600 | 13,200 | 4,800 | 300 | 300 | 13,500 | 18,300 |
| 1979 | 10,000 | 0 | 0 | 3,600 | 13,600 | 5,100 | 1,100 | 1,400 | 15,000 | 20,100 |
| 1980 | 10,400 | 0 | 0 | 3,600 | 14,000 | 2,800 | 600 | 2,000 | 16,000 | 18,800 |
| 1981 | 10,800 | 0 | 0 | 3,600 | 14,400 | 1,000 | 0 | 2,000 | 16,400 | 17,400 |
| 1982 | 11,200 | 0 | 0 | 3,600 | 14,800 | 0 | 0 | 2,000 | 16,800 | 16,800 |
| 1983 | 11,600 | 0 | 0 | 3,600 | 15,200 | 0 | 0 | 2,000 | 17,200 | 17,200 |

Totals may not add exactly due to rounding.

1/ Based on historical trend of construction employment in Alaska. Data are extrapolation of 1966-1972 trend presented in Human Resources Planning Institute, Inc./Urban and Rural Systems Associates, November 1974, Volume 1, Appendix A.

2/ Ibid. Appendix B. Tables B-15 to B-18 (High estimate, which assumes completion of Alyeska project delayed one year). Value for 1977 is estimate based on exclusion of gas pipeline workers from total construction employment in that year. It should be noted that values represent average and not peak levels.

3/ Induced construction employment figures derived from projections in HRPI/URSA 11/74 Volume 1, Appendix B wherein following lagged employment relationship from Alyeska project were observed: 1975 induced equals 26% of 1974 direct employment; 1976 equals 30% of increase in direct employment in 1975; 1977 (first year following decline in direct employment) equals approximately 50% of 1976 induced employment.

4/ Sum of current year induced employment plus previous years.

5/ Sum of Columns 1 and 4; represents Construction Sector baseline employment, excluding Alyeska direct (i.e., short-term) workers.

6/ Response No. 143 (see Appendix B). Data are annual averages of quarterly levels.

7/ Induced construction employment from the T-AGP parallels pattern of Alyeska project employment effects (see Note 3), with induced component appearing first in 1978.

8/ Cumulative induced equals current plus previous years' induced employment.

9/ Long-term baseline equals sum of Columns 5 and 8; represents sustained level of employment which stimulates permanent increases in total employment and population in the state. Excludes direct Alyeska and El Paso project workers from permanent employment base because of short-term nature of projects.

10/ Sum of Columns 2, 6, and 9; i.e., direct and induced employment.

| | |
|---|---|
| 3rd | 30 percent of incremental increase in direct employment in year 2 |
| 4th | 50 percent of incremental increase in direct employment in year 3 |
| 5th | None (no increase in second year of decline in level of direct employment) |

The cumulative induced changes in construction employment (cols. 4 and 8) were added to the baseline projections (baseline col. 1) to create a final total long-term sector baseline (col. 9). This column of data was then used in Table A-1 to develop a projection of total population.[5/]

Regional Growth

The allocation of population increases ~~among the various study regions~~ was based on the assumed location of the households of project construction and operating personnel. A major uncertainty stems from the absence of reliable estimates of the number of non-resident personnel that would be hired directly for the project or that would be attracted to the state by prospects of non-project employment. Related to this is the fact that the Alyeska project will have created an expanded reservoir of pipeline construction workers, many of whom are likely to remain in the state in hopes of finding employment on the Trans-Alaska Project. It is likely that a higher proportion -- perhaps the majority -- of the T-AGP construction will be resident Alaskans with dependents in the state. The principal stimuli to population growth in any area are assumed to derive from the local expenditures of project worker households and expanded public service spending by local

5/ In Table A-1 the data in parentheses, for the years 1978-1983, refer to the "without El Paso Alaska project" case, and are based on the adjusted baseline data in col. 5 of Table A-2.

political jurisdictions. The introduction of new spending streams from project payrolls and tax revenues generate other spending, new investments, and expanded employment requirements.[6/]

Following this reasoning, the assumption was made that local and regional population changes induced by T-AGP would be in proportion to the locational distribution of the project workers' households. The distinction between the location of the workers themselves versus their households is important because most of the project construction workers will be housed in work camps. The problem then resolves to estimating the location of the worker's households.

The estimates used are based on two principal factors. One is that most of the project hiring would take place in Anchorage. The other is the assumption that many if not most of the project workers (many of whom would be ex-Alyeska workers) would have dependents in the state.[7/] The expenditures by those households would contribute to the growth-inducing impacts of the project in the Anchorage area. The combination of these two factors led to the assumption that the majority of population increases would take place in the Anchorage area. The remainder of the increases would take place mainly in the Fairbanks and Cordova areas: Fairbanks because of its importance as a staging area for work in the Arctic and Interior, and Cordova because of its proximity to the LNG plant and marine terminal. Valdez will also experience some growth since the southern portion of the pipeline passes near there and a major maintenance base will be located there; however, it is not certain whether such growth would push total population past the peak experienced during the Alyeska project. In addition, a total of 65 project households will be housed at the LNG plant on Gravina Point.

6/ See Response #145 (See Appendix B), which discusses the operation of the "income multiplier."

7/ El Paso Alaska estimated that supervisory personnel would have on the average 1.575 dependents per worker. See Executive Summary, p. 107 (July 1974). The HRPI/URSA study estimates approximately 1.2 dependents per employed person statewide (see Table A-1).

The projected location of the project workforce is provided in Table A-3, which indicates both average annual and peak quarterly employment levels. These data are the basis for all revised calculations of socioeconomic impacts of T-AGP.

The El Paso Alaska project is not expected to stimulate significant population growth north of the Brooks Range, i.e., in the Arctic Study Area. Construction employment in the Arctic area will experience peaks of about 800 workers in the Fall-Winter seasons of 1977-78 and 1978-79, but average employment will amount to around one-half the peaks.[8/] The majority of the workers will likely come from the Anchorage and Fairbanks areas, although certainly some of the workers will be permanent residents of North Slope communities who previously worked on the Alyeska pipeline.

In the absence of more precise information on the origins of the project work force the allocation of project worker households was made on the basis of the following assumption. At least one-half of the workers will come from Anchorage (including non-residents hired there), and the remainder from locations in the study areas near the centers of construction and operations activities. In the Arctic study area, however, for purposes of simplifying the calculation, it is assumed the workers will come in equal numbers from Fairbanks and Anchorage.[9/]

The computations are presented in Table A-4, which shows the average annual number of worker households in each study area and the basis for the allocation. Thus, for example, in 1977 an average of 261

8/ Responses 118 and 143, (see Appendix B).

9/ It is recognized that some of the pipeline workers in the Arctic Study Area will be residents of North Slope communities (e.g., Barrow and Kaktovik). The percentage is likely to be small, however, and it is assumed that the principal growth stimulus would take place where the majority of the workers were hired.

TABLE A-3

TRANS-ALASKA GAS PROJECT AVERAGE ANNUAL EMPLOYMENT[1/] AND QUARTERLY PEAKS

| Study Area | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 |
|---|---|---|---|---|---|---|
| Total Project | | | | | | |
| Average Annual | 1,220 | 4,840 | 5,182 | 3,172 | 1,570 | 624 |
| Peak Quarter | 3,476(IV) | 7,567(IV) | 6,437(III) | 4,396(III) | 2,188(III) | |
| Arctic | | | | | | |
| Average Annual | 261 | 467 | 331 | 195 | 164 | 61 |
| Peak Quarter | 776(IV) | 779(IV) | 806(I) | 420(III) | 336(III) | |
| Interior | | | | | | |
| Average Annual | 650 | 1,241 | 876 | 369 | 341 | 129 |
| Peak Quarter | 2,062(IV) | 2,019(IV) | 2,046(I) | 753(III) | 693(III) | |
| South Coastal | | | | | | |
| Average Annual | 309 | 3,132 | 3,975 | 2,608 | 1,065 | 434 |
| Peak Quarter | 638(IV) | 4,769(IV) | 5,200(III) | 3,223(III) | 1,391(I) | |

Source: Response 118 (see Appendix B).

1/ Derived from Quarterly data. Roman numerals indicate quarter of year when maximum employment occurs. Includes operating personnel, who account for 100 percent of 1982 staffing.

TABLE A-4

PROJECTED LOCATION OF CONSTRUCTION AND OPERATION
WORKER HOUSEHOLDS, 1977-1982, TRANS-ALASKA GAS PROJECT

| Location of Household / Location of Worker[1] | 1977 Number | 1977 Percent | 1978 Number | 1978 Percent | 1979 Number | 1979 Percent | 1980 Number | 1980 Percent | 1981 Number | 1981 Percent | 1982 & Beyond Number | 1982 & Beyond Percent |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Interior[2] | | | | | | | | | | | | |
| 50% Arctic | 131 | | 234 | | 166 | | 98 | | 82 | | 31 | |
| 50% Interior | 325 | | 621 | | 438 | | 185 | | 171 | | 65 | |
| Total Interior | 456 | 38% | 855 | 18% | 604 | 12% | 283 | 9% | 253 | 16% | 96 | 15% |
| South Coastal | | | | | | | | | | | | |
| Gravina Point | | | | | | | | | | | | |
| 65 LNG & MT | 30 | 2% | 65 | 1% | 65 | 1% | 65 | 2% | 65 | 4% | 65 | 11% |
| Cordova | | | | | | | | | | | | |
| 50% balance LNG & MT | 41 | 3% | 1059 | 22% | 1576 | 31% | 1196 | 38% | 417 | 27% | 291 | 47% |
| Valdez | | | | | | | | | | | | |
| 50% S.C. Pipeline | 100 | 8% | 475 | 10% | 380 | 7% | 76 | 2% | 83 | 5% | 39 | 6% |
| Anchorage | | | | | | | | | | | | |
| 50% Arctic | 130 | | 233 | | 165 | | 97 | | 82 | | 30 | |
| 50% Interior | 325 | | 620 | | 438 | | 184 | | 170 | | 64 | |
| 50% S.C. Pipeline | 99 | | 475 | | 380 | | 75 | | 83 | | 39 | |
| 50% balance LNG & MT | 40 | | 1058 | | 1575 | | 1196 | | 416 | | -- | |
| Total Anchorage | 594 | 49% | 2386 | 49% | 2558 | 49% | 1552 | 49% | 751 | 48% | 133 | 21% |
| Total South Coastal[2] | 765 | 62% | 3985 | 82% | 4579 | 88% | 2889 | 91% | 1316 | 84% | 528 | 85% |
| GRAND TOTAL[2] | 1221 | 100% | 4840 | 100% | 5183 | 100% | 3172 | 100% | 1569 | 100% | 624 | 100% |

Notes: 1/ Based on annual average manpower levels from Response No. 143 (see Appendix B).

2/ Totals equal average annual number of project workers. Distribution of households based on assumption that one-half of Interior and Arctic area pipeline workers and virtually all of South Coastal area personnel will be hired in Anchorage. Assumes LNG plant and marine terminal construction personnel will divide households between Cordova and Anchorage, except for 65 households with living facilities at Gravina Point. Assumes pipeline workers in South Coastal area (south of Thompson Pass) will divide households between Valdez and Anchorage. In 1982 and beyond, all but 65 plant and terminal operating personnel are assumed to live in Cordova.

workers will be employed in the Arctic study area; all are assumed to have households in Alaska, one-half of them in the Interior Study Area (primarily Fairbanks) and the other half in Anchorage.[10/]

Adjoining each column of numbers of households in Table A-4 are corresponding percentages of the total number of workers' households. Thus, for example, in 1977, 62 percent of total households are in the South Coastal Study Area (including 49 percent in the Anchorage metropolitan area); of that total, nearly four-fifths[11/] are projected to be in the Anchorage area. These percentages were applied, year by year through 1981, to the population projections in Table A-1 to yield the total and incremental population changes in the local and regional portions of the South Coastal and Interior Study Areas (see Tables 4, 6, 12, 13, 15 and 19 in Section 3, and Revised Tables 3A.3-7 and 3A.3-8 in Appendix C). For 1982 and beyond, the projections were "fared" from the earlier construction period peaks (see Table A-6). From these, in turn, were derived projections of changes in needs for housing, education facilities and public services using averages of per capita requirements multiplied by population increments.

10/ The assumption that all project workers maintain households in Alaska can be relaxed somewhat if it is assumed that rest-and recreation trips to Anchorage and Fairbanks by non-Alaskan single workers to some extent approximate the economic stimulus to the local area of a smaller number of multi-person households.

11/ $\frac{49\%}{62\%} \times 100 = 79\%$

Public Service Costs and Revenues

The development of estimates of additional public services and their corresponding costs and revenues was based on recent budget information and estimates of the Alyeska project's impacts on local and state government. Budget information from the City of Anchorage, the Greater Anchorage Area Borough, the City of Cordova, the City of Fairbanks, and Fairbanks North Star Borough for the past several years was reviewed together with the Alaska State Legislature's Special Petroleum Impact Committee Study.[12/]

From these sources estimates were developed of per capita costs of such public sector services as police and fire protection, public health, public works (roads, waste treatment, utilities), education, recreation, and general administration. Values varied widely from jurisdiction to jurisdiction. For example, in the Fairbanks area police service is provided by the city within the city limits, but by the state (Alaska State Troopers) in the Borough outside the city. Any comprehensive average of costs is thus impractical.

The per capita cost factors for major categories of public services are presented in Table A-5. These values, covering operating expenses, were multiplied by the impact population projections for the period 1977-1981 (Table A-6) to yield total construction period impact costs of government operations (all expressed in constant 1973 dollars), which appear in Table 16.

Impact revenues from existing sources--sales tax, real and personal property taxes, and state revenue sharing--were calculated by applying a scale of rising percentages to annual costs over the first four years of construction. The percentages were derived from the special Petroleum Impact Committee study, from which it was observed

12/ Alaska State Legislature, "Report on Impact of Trans-Alaska Pipeline Construction on Governmental Services and Facilities," (Juneau, February 12, 1974).

TABLE A-5

PER CAPITA PUBLIC SERVICES OPERATIONAL COST FACTORS
(1973 Dollars)

| | Jurisdiction | | | | |
|---|---|---|---|---|---|
| Service Category | GAAB[1/] | Anchorage[1/] | FNSB[2/] | Fairbanks[2/] | Cordova[3/] |
| General Government | $ 60 | $ 15 | $ 61 | $128 | $ 75 |
| Public Safety | 15 | 150 | -- | 174 | 70 |
| Public Health | 75 | -- | 6 | 4 | 5 |
| Public Works | 5 | 10 | 5 | 109 | 95 |
| Recreation | 15 | 30 | 16 | -- | 40 |
| Education | 335 | 335[4/] | 384 | 384[4/] | 335 |
| TOTAL | $505 | $540 | $472 | $799 | $620 |

1/ Derived from the special Petroleum Impact Committee's Report on Impact of Trans-Alaska Pipeline Construction on Governmental Services and Facilities. Figures represent the average yearly per capita expenditures during Alyeska pipeline construction. General Government and Education figures for GAAB are derived from the 1972-73 budget, in order to fully reflect costs of service.

2/ Derived from per capita values in 1974-75 budgets.

3/ Derived from per capita expenditures for Valdez in Special Petroleum Impact Committee, Op. Cit. The same cost factors are assumed to apply to other impact areas.

4/ Administered by borough.

TABLE A-6

PROJECTED INCREMENTAL POPULATION GROWTH FOR SELECTED COMMUNITIES, 1977-1982

| Place | Year | | | | | |
|---|---|---|---|---|---|---|
| | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 and Beyond |
| Greater Anchorage Area Borough[1/] | 450 | 4,500 | 14,500 | 23,000 | 23,500 | 20,050 |
| Anchorage | 450 | 4,500 | 14,500 | 23,000 | 23,500 | 20,050 |
| Fairbanks North Star Borough[2/] | 33 | 900 | 1,433 | 1,400 | 1,367 | 1,100 |
| Fairbanks | 67 | 1,800 | 2,867 | 2,800 | 2,733 | 2,200 |
| Cordova | 400 | 4,800 | 7,100 | 5,400 | 2,000 | 1,800 |
| Other | nil | 2,500 | 1,600 | 1,400 | 1,900 | 1,800 |
| TOTAL | 1,400 | 19,000 | 42,000 | 57,000 | 55,000 | 47,000 |

Sources: Tables 3A.3-7 (Rev.) and 3A.3-8 (Rev.) (Appendix C).

1/ Portion outside City of Anchorage; assumed to equal one-half total Anchorage area growth.

2/ Portion outside City of Fairbanks; assumed to equal one-third of Fairbanks area growth.

that there was a lagged response between revenues and projected increases in costs. The lag was due primarily to the lapse that occurs between the time a new resident arrives and his new dwelling unit is established (assuming the stock of rental housing is depleted by earlier arrivals), assessed, and the tax is paid--typically a period of some 18 months.

During the period of population expansion associated with a project, the more rapid growth of public service costs over revenues leads to a shortfall in cash. By the fourth to fifth year of the project, however, revenues catch up with costs, mainly because the population surge ends with the winding down of project employment. With the Alyeska project the following pattern of revenue growth is predicted for a number of jurisdictions:

| Year of Project | Percent of Impact Costs Covered by Ordinary Revenues |
|---|---|
| 1st | 5-15% |
| 2nd | 30-50% |
| 3rd | 70-90% |
| 4th | 90-110% |

For the present study, revenues are projected using the midpoint value: first year, 10 percent; second year, 40 percent; third year, 80 percent; and fourth year, 100 percent. The general similarity of the Alyeska and El Paso Alaska projects with respect to the pattern of construction manpower buildup and deployment justified the adoption of the Alyeska revenue trend for the present study.

B

APPENDIX B

REVISED RESPONSES TO
FPC 2/7/75 SUPPLEMENTAL
DATA REQUESTS

RESPONSES:

118
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El Paso Alaska Company
FPC Docket Nos. CP75-96, *et al.*
Data Request of 2/7/75

Question No. 118

Provide a geographical deployment and construction schedule for the 6,000 workers mentioned on Page 2A.7-1, Volume IV.

Response No. 118

The LNG Plant construction workers will reside in dormitories and mobile homes located near the LNG Plant on Gravina Point.

The Marine Terminal construction workers will reside on the construction barges or in the land-based dormitories on Gravina Point.

The gas pipeline construction workers will reside at six work camps situated along the pipeline; the locations of which have not been selected at this time. Also, see the response to Question No. 35.

A schedule of the construction workforce requirements listing corresponding geographical deployment and project components is included, entitled as follows:

CONSTRUCTION MANPOWER SCHEDULE AND
GEOGRAPHICAL DEPLOYMENT DATA

In addition, projected operating and maintenance manpower requirements are given in the tabulation following. The geographical regions shown in this table are comprised of Census Divisions as defined by the U. S. Department of Commerce, Bureau of the Census, and incorporate the 1973 revisions to the division boundaries. The pipeline mileposts listed delineate either the approximate intersections of the pipeline and the boundaries of the regions or the location of the project component. Construction is scheduled to begin in the third year of the project.

TRANS-ALASKA GAS PROJECT

CONSTRUCTION MANPOWER SCHEDULE AND GEOGRAPHICAL DEPLOYMENT DATA

| REGION* | PIPELINE MILEPOST | PROJECT COMPONENT | YEAR 3 | | | | YEAR 4 | | | | YEAR 5 | | | | YEAR 6 | | | | YEAR 7 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| 6 | 0-180 | Pipeline | | 87 | 180 | 776 | 776 | 244 | 67 | 779 | 806 | 148 | 291 | 78 | 83 | 126 | 374 | 53 | 42 | 62 | 275 | 40 |
| 7 | 180-420 | Pipeline | | 94 | 156 | 1126 | 1123 | 442 | 69 | 1127 | 1138 | 149 | 361 | 91 | 100 | 91 | 314 | 66 | 60 | 94 | 518 | 66 |
| 2 | 420-610 | Pipeline | | 91 | 198 | 936 | 889 | 283 | 139 | 892 | 908 | 172 | 585 | 98 | 87 | 122 | 359 | 55 | 39 | 44 | 46 | 23 |
| 4 | 610-809 | Pipeline | | 99 | 186 | 509 | 493 | 1227 | 837 | 1243 | 1313 | 862 | 805 | 58 | 47 | 87 | 319 | 58 | 47 | 64 | 277 | 43 |
| 4 | 809 | LNG Plant | 30 | 50 | 100 | 100 | 247 | 1019 | 3563 | 3465 | 2150 | 3207 | 4158 | 2712 | 2129 | 2515 | 2643 | 1703 | 1019 | 535 | 475 | 275 |
| 4 | 809 | Alaskan Marine Terminal | 23 | 45 | 40 | 16 | 69 | 120 | 120 | 35 | 70 | 120 | 120 | 20 | | | | | | | | |
| TOTAL | | | 53 | 466 | 860 | 3463 | 3597 | 3335 | 4795 | 7541 | 6385 | 4658 | 6320 | 3057 | 2446 | 2941 | 4009 | 1935 | 1207 | 799 | 1591 | 447 |

* Region 6 includes the Barrow - North Slope Census Division
Region 7 includes the Yukon - Koyukuk and Upper Yukon Census Divisions
Region 2 includes the Fairbanks and Southeast Fairbanks Census Divisions
Region 4 includes the Valdez - Chitina - Whittier and Cordova - McCarthy Census Divisions

TRANS-ALASKA GAS PROJECT

OPERATION AND MAINTENANCE WORKFORCE DATA PROJECTION

| REGION | DESCRIPTION | YEAR 3 | | | | YEAR 4 | | | | YEAR 5 | | | | YEAR 6 | | | | YEAR 7 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| 6 | Pipeline | | | | | | | | | | | | | 15 | 38 | 46 | 46 | 53 | 61 | 61 | 61 |
| 7 | Pipeline | | | | | | | | | | | | | 15 | 31 | 38 | 45 | 45 | 59 | 73 | 73 |
| 2 | Pipeline | | | | | | | | | | | | | 21 | 42 | 42 | 49 | 56 | 56 | 56 | 56 |
| 4 | Pipeline | | | | | | | | | | | | | 13 | 26 | 26 | 26 | 39 | 52 | 65 | 78 |
| 4 | LNG Plant | | 12 | 13 | 13 | 13 | 25 | 25 | 26 | 34 | 34 | 117 | 122 | 136 | 149 | 188 | 219 | 239 | 258 | 295 | 309 |
| 4 | Alaskan Marine Terminal | | | | | | | | | | | | | 23 | 30 | 47 | 47 | 47 | 47 | 47 | 47 |
| TOTAL | | | 12 | 13 | 13 | 13 | 25 | 25 | 26 | 34 | 34 | 117 | 122 | 223 | 316 | 387 | 432 | 479 | 533 | 597 | 624 |

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Question No. 131

For each city, village, or political subdivision that would be significantly impacted by the project, prepare a benefit cost analysis like the one requested in the previous question, except that it would be from the accounting stance or point of view of the individual city or village being considered. These analyses should consider annual increases in cost of local services (such as police, health, educational and fire services), increases in project related tax revenues, and other important impacts.

Response No. 131 (Revised 7/25/75)

The following summary of benefits and costs includes the Greater Anchorage Area Borough and the City of Anchorage, Fairbanks North Star Borough and the City of Fairbanks, the City of Cordova, and the remaining communities in the impact area. The latter were not assessed individually since population increments have not been apportioned to the small communities in the impact area.

Table 131 compares projected total revenues from residential and project-generated property taxes, sales taxes, and state revenue sharing programs with estimated total public service costs for the 1977-1981 construction phase and on an annual basis for the subsequent 25 year operating phase. Tax revenues were estimated on the basis of a lagged relationship between the incurring of additional expenses and the subsequent expansion of the property tax base (see Appendix A).

Under the provisions of Revenue Code 119 (Citation AS 29.53.045), the Fairbanks North Star Borough and the North Slope Borough will have authority to levy and collect a tax on project related property at the same rate of taxation that applies to the other taxable property in the Borough. Alternatively, the Boroughs are subject to a statutory $1,000 per capita ceiling. Property tax revenues from the T-AGP facilities accruing to the Fairbanks North Star Borough and the North Slope Borough are estimated at $6.3 million per year assuming that the projected valuation to revenue ratio associated with Alyeska will be applicable to the Applicant's project. The projected Alyeska valuation to revenue ratio (in each Borough) is obtained from "Revenue Sources," Department of Administration, Division of Budget and Management, 1974. Thus, the Fairbanks North Star Borough, projected to receive five percent of

Question No. 131 (Continued)

total annual Alyeska property tax revenues in the state, is assumed here to receive five percent of the total annual Applicant's generated property tax revenues, i.e., five percent x $63 million annual Applicant's property tax revenue = $3.15 million. The North Slope Borough's proportion of Alyeska based property tax revenue is also five percent, yielding in the El Paso case, five percent x $63 million = $3.15 million. These estimated revenues for the Fairbanks North Star Borough and the North Slope Borough are included in the annual revenue (benefits) column in Table 131, with the North Slope Borough revenue being placed in the "other impact areas" category.

While recognizing the possibility of state impact aid, the analysis indicates that all jurisdictions are projected to operate in an unfavorable position during the 1977-1983 construction period. This brief comparative analysis demonstrates that a formal impact aid program will be necessary to assist in mitigating the impact of the Trans-Alaska Gas Project, at least during the construction period. This conclusion is consistent with current and emerging policy positions in the state vis-a-vis Alyeska.

Complete reliance on state impact aid on the part of local governments may be offset in part by the adoption of municipal income and/or occupational tax measures. The annexation of project related property by municipalities could also expand local revenue sources, thereby circumventing an otherwise circuitous state grant-in-aid system. The City of Cordova will undoubtedly pursue an expansive revenue generating stategy, namely the annexation of the proposed Gravina Point plant site. The union of Cordova with other coastal municipalities, including Valdez, in the formation of one southern coastal borough would also limit the state's role and responsibility in local finance and government operations.

The proposed formation of a Southeast Fairbanks Borough, an Upper Yukon Borough, and the Ahtna Borough would, of course, have similar property tax revenue equalization effects.

TABLE 131 (Revised 7/25/75)

PUBLIC REVENUES AND COST IMPACTS
OF TRANS-ALASKA GAS PROJECT FOR SELECTED AREAS
(000 - 1973 $)

| Jurisdiction | Total[1/] 1977-1981 Revenues | Total[1/] 1977-1981 Public Service Costs | Annual[2/] 1982, etc. Public Service Costs |
|---|---|---|---|
| Greater Anchorage Area Borough | 50,534 | 55,398 | 17,220 |
| City of Anchorage | 12,289 | 13,520 | 4,203 |
| Fairbanks North Star Borough | 5,303 | 6,365 | 1,364 |
| City of Fairbanks | 3,550 | 4,261 | 913 |
| City of Cordova | 4,286 | 7,116 | 559 |
| Other Impact Areas | 3,614 | 4,588 | 1,116 |
| Total | 79,396 | 91,248 | 25,375 |

1/ From Table 16 (Revised 127); revenues from ordinary sources; costs for operations only.

2/ These represent the incremental public service operating costs resulting from project related population increases. A corresponding increase in revenues (exclusive of property tax revenues from pipeline facilities) is expected to offset the annual costs during the operating period and thereafter.

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Question No. 141

What is the projected population increase for Valdez that would be attributed to the construction and operation of the proposed El Paso project?

Response No. 141 (Revised 7/25/75)

By 1977, the Valdez area is projected to have a population of about 7,000. This population is based on an ongoing study of Valdez by the Anchorage Senior College and the University of Alaska. In a press interview in June 1974 (reported in the Fairbanks Daily News-Miner, Thursday, June 6, 1974) the following information was provided by Dr. Michael Bering-Gould, director of the study:

> The population of 1,200 (of Valdez) will grow to 4,800 during this first year of construction with a top of 10,000 in 1975. It is expected this population will level off around 5,000 by 1980. . . .

With 1977 as the mid-point between 1975 and 1980, a level of 7,000 inhabitants is regarded as a reasonable baseline population estimate for Valdez at the point when work commences on the gas pipeline project.

The principal increments to the Valdez population as a result of the Trans-Alaska Gas Project are expected to be the households of personnel on the construction and operation phases of the pipeline. Many (assumed to be one-half) of the personnel to be employed in the Valdez area are expected to have their residences in Anchorage (where most hiring is to take place), with the Applicant providing transportation for rest and recreation leaves. Some of the personnel (and their dependents) are likely to be permanent residents of Valdez (probably ex-Alyeska construction workers); thus they will, by definition, not constitute additions to the local population. It is not possible to estimate their numbers, but it is believed the permanent Alaska resident component of the T-AGP work force will be significant.

Revised Response No. 141 (Continued)

On the basis of pipeline construction manning, a maximum of approximately 400 to 500 construction personnel households would be located in the Valdez area. Assuming a maximum of three dependents, then the total local population associated directly with the project would number around 1,500 persons of whom perhaps one-half would be new, relocated residents. Assuming the employment multiplier was of the same magnitude (1.5) as the income multiplier for the state (see response to Question 149e) and that workers from induced employment had a similar dependency ratio, then an additional 250-350 persons would be attracted to the Valdez area (one-half the newly relocated T-AGP workers and dependents).

The total maximum construction phase impact, therefore, would be 300 to 400 additional households or upwards of 1,200 additional residents. An unknown number of subcontractor personnel may be hired and housed locally. To the extent that such workers include transients from "outside" the Valdez area, then the local populations would be expanded beyond the levels indicated above. No information is available, however, on whether such subcontracting would significantly augment projected staffing levels. (See response to FPC Questions 118 and 143 for projected composition of construction work force).

After completion of construction, pipeline operation activities in the Valdez area will consist primarily of operation of one of the four system maintenance bases (Base D). Each base will probably contain living quarters for 30 men plus operating facilities. It is estimated that supervisors will comprise perhaps one-fourth to one-third of the base personnel. But even if all the base workers were permanent residents, they would not exceed the number of construction supervisors that will have been residing in Valdez prior to the commencement of operations. Thus, it is expected that after operations begin, the gas pipeline-induced population in Valdez will recede slightly.

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Question No. 143

On page 1-11 of Volume II, it states that "the project will employ an average work force of 16,360 personnel over the engineering, purchasing and construction period." In the construction manpower summary on the same page the work force is broken down to reflect the construction manpower involved in each of the project components (i.e., LNG plant-peak manpower 5,600 and average manpower 3,458). It is requested that a detailed breakdown of the construction manpower requirements for each component of the construction manpower requirements for each component of the project be provided. If possible this data should be provided in a form similar to that shown in Table No. 3.3-T4 and Figure 3.3-F2 on pages 3.3-10 and 11, respectively.

Response No. 143 (Revised)

This revised response is submitted for the purpose of correcting erroneous data in TABLE II of the previously submitted Response to Question No. 143. Those errors were the result of a misinterpretation of the conversion of construction manhours into a detailed breakdown of manpower requirements. The detailed tabulations of the construction manpower requirements for each of three project components are included, labeled as follows:

| | |
|---|---|
| TABLE I | PIPELINE CONSTRUCTION MANPOWER REQUIREMENTS |
| TABLE II | LNG PLANT CONSTRUCTION MANPOWER REQUIREMENTS |
| TABLE III | ALASKAN MARINE TERMINAL CONSTRUCTION MANPOWER REQUIREMENTS |

A breakdown of manpower data for the fourth project component, the LNG Carrier Fleet, is not available. The average manpower requirements shown in Volume II of the Applicant's filing made on September 24, 1974, were derived from proprietary estimates by a U.S. ship building company.

Response No. 143 (continued)

The format used for the included manpower tabulations employs a time schedule rather than average or maximum figures because of the variation of the manpower requirements with season and construction phase. Construction is scheduled to begin in the third year of the project.

TRANS-ALASKA GAS PROJECT

TABLE I-PIPELINE CONSTRUCTION MANPOWER REQUIREMENTS

| JOB CLASSIFICATION | YEAR 3 | | | | YEAR 4 | | | | YEAR 5 | | | | YEAR 6 | | | | YEAR 7 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| WELDERS & HELPERS | | 14 | 93 | 733 | 690 | 407 | 174 | 821 | 830 | 183 | 275 | | | 32 | 152 | | | 24 | 136 | |
| OPERATORS & OILERS | | 27 | 77 | 693 | 684 | 484 | 219 | 886 | 901 | 236 | 372 | | 4 | 29 | 190 | | 4 | 12 | 152 | |
| TRUCK DRIVERS | | 90 | 161 | 533 | 531 | 356 | 168 | 651 | 675 | 175 | 284 | | 8 | 79 | 200 | | 8 | 12 | 128 | |
| DRILLERS & POWDER MEN | | | | 81 | 81 | 88 | 53 | 134 | 134 | 53 | 69 | | | | 16 | | | | 16 | |
| PIPEFITTERS | | | | | | | | | 15 | 30 | 124 | | | | 124 | | | | 124 | |
| PLUMBERS | | | | | | | | | 2 | 8 | 16 | | | | 16 | | | | 16 | |
| CARPENTERS | | | | | | | | | 6 | 24 | 16 | | | | 16 | | | | 16 | |
| STATION MECHANICS | | | | | | | | | 1 | 4 | 16 | 14 | 12 | | 16 | 4 | | | 16 | 4 |
| ELECTRICIANS | | | | | | | | | 17 | 52 | 208 | 98 | 78 | | 208 | 40 | | | 208 | 40 |
| LABORERS | | 42 | 153 | 923 | 911 | 595 | 239 | 1122 | 1158 | 297 | 383 | 40 | 42 | 62 | 192 | 20 | 12 | 36 | 112 | 20 |
| SUPERVISORY & CLERICAL | | 66 | 74 | 150 | 150 | 83 | 83 | 180 | 191 | 67 | 77 | 13 | 13 | 52 | 64 | 8 | 4 | 8 | 20 | 8 |
| INSPECTORS | | 22 | 22 | 44 | 44 | 33 | 26 | 57 | 45 | 22 | 22 | 10 | 10 | 22 | 22 | 10 | 10 | 22 | 22 | 10 |
| SURVEYOR & X-RAY TECH. | | 10 | 10 | 60 | 60 | 20 | 20 | 60 | 60 | 50 | 50 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 10 |
| ENGINEERS, LEGAL & PURCH. | | 50 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 |
| OVERHEAD & SUB-CONTRACTS | | 50 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 50 |
| TOTAL | | 371 | 720 | 3347 | 3281 | 2196 | 1112 | 4041 | 4165 | 1331 | 2042 | 325 | 317 | 426 | 1366 | 232 | 188 | 264 | 1116 | 172 |

TRANS-ALASKA GAS PROJECT

TABLE II-LNG PLANT CONSTRUCTION MANPOWER REQUIREMENTS

| JOB CLASSIFICATION | YEAR 3 | | | | YEAR 4 | | | | YEAR 5 | | | | YEAR 6 | | | | YEAR 7 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| BOILERMAKERS | | | | | 2 | 18 | 127 | 140 | 85 | 160 | 198 | 115 | 85 | 95 | 115 | 60 | 30 | 13 | 13 | 9 |
| OPERATORS | 2 | 2 | 6 | 6 | 10 | 60 | 155 | 140 | 75 | 130 | 140 | 120 | 65 | 75 | 80 | 60 | 35 | 12 | 12 | 8 |
| OILERS | 1 | 1 | 2 | 2 | 5 | 20 | 55 | 55 | 30 | 70 | 45 | 40 | 20 | 25 | 30 | 25 | 10 | 4 | 3 | 2 |
| TRUCK DRIVERS | 4 | 4 | 6 | 6 | 8 | 12 | 38 | 25 | 15 | 20 | 25 | 30 | 18 | 19 | 21 | 12 | 10 | 8 | 8 | 8 |
| PIPEFITTERS | 1 | 3 | 9 | 6 | 25 | 124 | 724 | 729 | 540 | 772 | 1257 | 708 | 543 | 664 | 780 | 435 | 205 | 54 | 44 | 20 |
| SHEET METAL WORKERS | | | | | | 1 | 4 | 1 | 2 | 9 | 30 | 25 | 35 | 45 | 54 | 32 | 20 | 10 | 10 | 10 |
| CARPENTERS | 5 | 12 | 25 | 23 | 43 | 180 | 639 | 520 | 235 | 370 | 380 | 130 | 102 | 100 | 100 | 75 | 55 | 21 | 21 | 9 |
| MILLWRIGHTS | | | | | 1 | 11 | 67 | 82 | 70 | 85 | 115 | 100 | 90 | 90 | 86 | 35 | 25 | 12 | 12 | 11 |
| ELECTRICIANS | 2 | 2 | 3 | 4 | 9 | 63 | 212 | 232 | 180 | 230 | 270 | 184 | 115 | 160 | 180 | 130 | 81 | 45 | 46 | 32 |
| LABORERS | 5 | 11 | 17 | 20 | 40 | 191 | 768 | 721 | 322 | 423 | 520 | 260 | 170 | 160 | 182 | 150 | 78 | 37 | 39 | 27 |
| CEMENT MASONS | | | 2 | 2 | 5 | 23 | 99 | 73 | 41 | 55 | 63 | 25 | 18 | 12 | 12 | 12 | 5 | 2 | 2 | 2 |
| IRON WORKERS, STRUCTURAL | 1 | 1 | 3 | 2 | 5 | 60 | 271 | 250 | 150 | 210 | 270 | 220 | 120 | 140 | 115 | 56 | 25 | 12 | 12 | 9 |
| IRON WORKERS, REBAR | 2 | 7 | 12 | 9 | 20 | 61 | 142 | 135 | 55 | 73 | 105 | 75 | 75 | 80 | 72 | 30 | 10 | 1 | | |
| INSULATORS | | | | | 2 | 7 | 27 | 17 | 25 | 150 | 270 | 220 | 230 | 410 | 408 | 295 | 200 | 81 | 80 | 57 |
| PAINTERS | | | | | 2 | 10 | 35 | 50 | 30 | 50 | 70 | 80 | 63 | 60 | 58 | 46 | 30 | 23 | 23 | 21 |
| STAFF-SUPERVISORY, OFFICE & ENGR. | 7 | 7 | 15 | 20 | 70 | 178 | 200 | 295 | 295 | 400 | 400 | 380 | 380 | 380 | 350 | 250 | 200 | 200 | 150 | 50 |
| TOTAL | 30 | 50 | 100 | 100 | 247 | 1019 | 3563 | 3465 | 2150 | 3207 | 4158 | 2712 | 2129 | 2515 | 2643 | 1703 | 1019 | 535 | 475 | 275 |

TRANS-ALASKA GAS PROJECT

TABLE III-ALASKAN MARINE TERMINAL CONSTRUCTION MANPOWER REQUIREMENTS

| JOB CLASSIFICATION | YEAR 3 | | | | YEAR 4 | | | | YEAR 5 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| WELDER FOREMEN | | | | | | 2 | 2 | | | 2 | 2 | |
| WELDERS | | | | | 4 | 14 | 14 | 4 | 4 | 14 | 14 | |
| OPERATING FOREMEN | 2 | 3 | 3 | 1 | 2 | 4 | 4 | | 2 | 4 | 4 | |
| OPERATORS | 3 | 8 | 4 | 1 | 13 | 24 | 24 | 2 | 13 | 24 | 24 | |
| OILERS | | 1 | 2 | 1 | 4 | 8 | 8 | | 4 | 8 | 8 | |
| TRUCK DRIVERS | 8 | 15 | 10 | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | |
| BLASTERS | 3 | 3 | | | | | | | | | | |
| CARPENTERS | | | | | | 4 | 4 | | | 4 | 4 | |
| MECHANICS | | | | | 2 | 3 | 3 | 2 | 2 | 3 | 3 | |
| CONCRETE FOREMEN | | | | | | 2 | 2 | | | 2 | 2 | |
| CONCRETE FINISHERS | | | | | | 4 | 4 | | | 4 | 4 | |
| CONCRETE LABORERS | | | | | | 8 | 8 | | | 8 | 8 | |
| PILE DRIVER FOREMEN | | 1 | 2 | 1 | 2 | 2 | 2 | | 2 | 2 | 2 | |
| PILE DRIVERS | | 5 | 10 | 5 | 12 | 12 | 12 | | 12 | 12 | 12 | |
| BARGEMASTERS | | | | 1 | 2 | 2 | 2 | | 2 | 2 | 2 | |
| DECK HANDS | | | | | 4 | 6 | 6 | 2 | 4 | 6 | 6 | |
| CREWBOAT CAPTAIN | | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | |
| SUPERVISORY STAFF | 1 | 2 | 2 | 1 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 5 |
| OFFICE STAFF | 2 | 2 | 2 | 2 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 |
| ENGINEERING STAFF | 4 | 5 | 5 | 3 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| TOTAL | 23 | 45 | 40 | 16 | 69 | 120 | 120 | 35 | 70 | 120 | 120 | 20 |

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Question No. 145

Section 2A.7.4.2.3 in Volume IV states that "no actual downturn in total area employment is expected to follow completion of construction activities on the Alyeska pipeline because of counteracting expansion of employment fueled by non-pipeline investment." What specific or projected non-pipeline investment does the applicant know of that supports this statement?

Response No. 145

The assumption of continuous growth in construction and total employment in the state is based on consideration of factors which are discussed below.

Alaska Native regional corporations, which will receive some 40 million acres and upwards of $1 billion over the next several years, will be a major source of private investment in Alaska. To the greatest extent possible, each will develop the natural resource potential of lands it acquires under the settlement act of 1971 (ANCSA). The corporations are now actively engaged in resource inventories and evaluations of land which they have already or will soon select. Several potentially significant timber and metallic mineral development schemes are now being studied (including the possibility of joint ventures with major non-Alaskan mining and lumber companies), and four of the regional corporations have agreements with major oil companies for exploration of their land.

Congress is also expected to approve the designation of some 83 million acres of Alaska as national parks, forest, wild and scenic rivers, and wildlife refuges, in accordance with recommendations made by

Response No. 145 (Continued)

Secretary of the Interior Rogers Morton, acting under statutory authority of Section 17.D.2 of the Alaska Native Claims Settlement Act. Although the transfer of this acreage into specialized land management agencies will not result in significant capital investment by the federal government, it is expected to spur greatly the state's tourism industry. Employment in the tourism industry is now significant, and additional income would increase this employment. (Tourism accounted for $85 million or 5 percent of total personal income in the state in 1974, and the industry has grown at an average annual rate of 15 percent since 1964, with a 24 percent growth rate recorded for the 1973 to 1974 period.)

Oil and gas development on the Outer Continental Shelf (Gulf of Alaska) region and the potential for petrochemical industrial development in the Prince William Sound area are also prospective sources of income and employment in the state. The feasibility of increased refinery developments in the Central Copper River Basin and at other junctures in proximity to the Alyeska Pipeline has been noted since 1971.1/ Plans for the $100 million Sustina River Basin hydroelectric project will be submitted to Congress by the Army Corps of Engineers in 1975, with construction scheduled for some time around 1980, assuming Congressional appropriations by 1977. Beyond the fact that the latter project would be a major source of construction employment (the project includes

1/ Alaska Pipeline Report, 1971. Institute for Social, Economic, and Government Research, University of Alaska, Fairbanks, Alaska, p. 89.

Response No. 145 (Continued)

recreational and flood control features), the 600 megawatt power source would affect an important inter-tie of the Anchorage and Fairbanks power grids (1969 Alaska Power Survey, p. 65).

Perhaps most significant is the investment potential related to the annual $310 million in oil- and gas-based state revenues, a figure that amounts to approximately 40 percent of the current state budget. The state's investment and expenditure of royalty income whether cash or "in kind," will clearly effect a major expansion and improvement of roads, highways, communications, power sources, and the infrastructure generally. Airports constructed at Prospect Creek, Dietrich, and Galbraith Lake (Alyeska financed) will be turned over to the state upon pipeline completion, and the state-owned airport at Deadhorse will receive $13 million in improvements by 1980. The expansion of port and cargo facilities in Anchorage and Valdez will increase the transport capacities in those two cities.

Examples of non-pipeline public investment that have already been initiated in the state include:

1. The continuation of the $120 million Chena River flood control project;
2. $200 million in plant expansions in the Kenai area;
3. The implementation of approved bond issues in the state totaling $150 million, including $40.3 million for 32

Response No. 145 (Continued)

> school projects, $40 million for the University of Alaska, $37 million for highways and roads, $10.9 million for health care facilities, $7.5 million for Pioneer Homes, and $2.7 million for fire protection facilities. The National Bank of Alaska Economics Department estimates that non-pipeline public and private construction activity will exceed $500 million in 1975. The most significant public investment program scheduled for the coming years is the City of Valdez' authorized $2 billion revenue bond sale to finance the marine terminal and pollution control facilities related to Alyeska operations. This has been identified as the single largest bond issue authorized by a municipality in the history of the United States (National Bank of Alaska, Annual Report, 1974, p. 16).

The rise in public investment alone would have an obvious expansionary effect on the absolute level of personal income in the state, particularly if it is directed at improved transportation, communications, power, and other infrastructure systems that provide the basis for economic growth. The assumption of a continuous and sustained growth in employment is thus based more on the state's very real potential for a diversification in markets rather than specific non-pipeline investment plans. An analysis of the income multiplier may serve to explain this potential more precisely.

Response No. 145 (Continued)

The income multiplier may be constructed in an expanded form to reflect the marginal propensity to save or to invest as well as the marginal propensity to consume. State and local government spending patterns may also be included, and more importantly, the "leakage" of income from the state's economy due to the importation and/or absentee consumption of goods and services can also be illustrated.

If it is assumed, for example, that the marginal propensity to save and the marginal propensity to consume in the state and the relative value of state and local expenditures are coincident with national patterns, then the marginal propensity to consume would approximate 0.60, the marginal propensity to invest, 0.16, and the marginal propensity of state and local government spending would approximate 0.07.[2/] These factors are the basic elements of the multiplier and may be incorporated into the formula, portraying the infinite respending of any net change or addition in total income. The calculation of the multiplier effect can thus be described in written form as:

$$\text{Total change in income} = \text{change in income} \times \frac{1}{1 - (MPC + MPI + MPGS)}$$

where MPC refers to the marginal propensity to consume, MPI is the marginal propensity to invest, and MPGS is the propensity for state and local government spending.

2/ Marginal consumption rate derived from national consumption and income changes for 1973 and 1974 as recorded in the "Survey of Current Business," Vol. 55, #1, January 1975, p. S-1. Marginal propensities of state and local government spending and private investment are also assumed to be equal to national rates.

Response No. 145 (Continued)

As noted earlier, the relatively undeveloped and undiversified nature of the Alaska economy, the high degree of import dependency, and the geographical isolation of the state currently result in a substantial leakage of both public and private income. Thus while 60 percent of a change in personal income may be expended locally for goods and services, it is estimated that no more than 30 percent of this amount currently remains in the state economy and income stream.3/ The multiple income effects of public and private investment will also be dampened by a similar loss of expenditures on goods and service imports.

If it is estimated further that the changes in business inventories are subject to a total reliance on imports and are therefore equal to zero, and that residential and nonresidential construction and public capital construction expenditures exhibit a 30 percent leakage factor,4/ then the multiplier would be refined or adjusted as follows:

---

3/ The 30 percent rate is simply the inverse of an estimated 70 percent leakage from the state income stream. Leakage rate calculated by assuming 100 percent importation of all durables and nondurables, and 50 percent of transportation services. Data for IV quarter 1974 derived from "Survey of Current Business," op. cit.

4/ Residential construction is assumed to equal 20 percent of total private investment and nonresidential construction 73 percent, based on national rates. Seventy percent of construction costs assumed to be labor costs with 30 percent tied to imported materials, supplies, etc. Change in business inventories are assumed to equal 0 and not added in. State and local government capital investment and operational expenditures are based on current Alaska public finance patterns and are given values of 30 percent and 70 percent, respectively.

Response No. 145 (Continued)

$$Y = \Delta Y \times \frac{1}{1 - [(.60 \times .30) + (.20 \times .16 \times .70) + (.73 \times .16 \times .70) + (.30 \times .07 \times .70) + (.70 \times .07)]}$$

(MPC) (RCI) (NRCI) (GI) (GO)

$$= \frac{1}{1 - (.18 + .02 + .08 + .01 + .05)}$$

$$= \frac{1}{1 - (.34)}$$

$$= 1.52$$

MPC = Marginal Propensity to Consume
RCI = Residential Construction Investment
NRCI = Non-residential Construction Investment
GI = Government Investment
GO = Government Opns.
ΔY = Change in Income
Y = Total Change in Income

While these coefficient values are judged to be close approximations of actual values, they are not the results of an in-depth analysis of the state's economy. The purpose here is simply to reveal the dynamics of the multiplier as it operates over time and more specifically to highlight the separable influence that local consumption and investment may exercise in the state's economy. It can be seen that both public and private investment have the obvicus effect of generating employment in the construction sectors.

The propensity of state and local governments to invest in both capital facilities and operations will undoubtedly increase after 1980. This would be illustrated in the multiplier model by an increase in the coefficient associated with state and local government spending.

More importantly, if the nature of the state's investment is oriented toward improved communications, transportation, power systems, and infrastructure development in general, then the growth of new and more accessible markets and an increase in commercial and trade activity

Response No. 145 (Continued)

would undoubtedly be stimulated. The net effect would be a reduction in the leakage factor which would be illustrated in the multiplier notation by increasing the rate at which local income remains in the economy. Thus any additions to personal income in the state would result in a greater expansionary effect on local income and therefore on employment.

Finally, it is noted that the Alaska State Legislature's Special Petroleum Impact Committee has also considered the possibility of pipeline-generated employment and population discontinuities in the state. The Committee observed in its 1974 report on potential impacts of the trans-Alaska oil pipeline, "Some government leaders are concerned that public improvements made to meet demands during construction may lead to over-building with a resultant debt-burden existing in a community long after construction is completed. In nearly every case, the Committee's conclusion is that the cities will not decrease substantially in population after (pipeline) construction is completed."5/

With respect to the Anchorage Borough, it was noted "Employment is expected to increase, particularly during the 3 years of construction. Following past boom periods, the population of the Anchorage area did not drop drastically. The number of jobs continued to climb. No significant reduction is anticipated after the pipeline is completed even without other major projects."6/

5/ Alaska Legislative Council, Report on Impact of Trans-Alaska Pipeline Construction, 1974, p. 23.

6/ Ibid, p. 36.

El Paso Alaska Company
Docket Nos. CP75-96, *et al.*
Data Request of 2/7/75

Question No. 149

Please provide the assumptions, calculations, or analyses (including working papers) used for the conclusions presented in the socio-economic description and impact sections. Some examples of this basic material which was not provided are:

(a) How are state corporate income taxes calculated? (3A.2-40)

(b) How are projections made of the need for major public services? (3A.4-37, Table 3A.4-11)

(c) What is the basis for assuming that disposable income is 80 percent of wages? (3A.4-35)

(d) What is the basis for assuming that "one-half of the after-tax construction payroll is spent locally?" (3A.4-35)

(e) What is the basis for assuming a 1.5 income (disposable income?) multiplier? (3A.4-35)

(f) How were the number of children calculated from which education impacts were determined?

Response No. 149

(a) The Alaska Corporation Income Tax is computed by applying a rate of 18 percent to the Federal Corporation Income Tax rate in effect as of December 21, 1963 (Alaska, Department of Administration, Division of Budget and Management, "Revenue Services, Alaska, Fiscal Years 1973-79," Juneau, 1974, p. 7). The statement on page 3A.2-40 (first sentence of bottom paragragh) that the tax was computed on the basis of 6 percent of taxable income was in error; the figure should have been reviewed and are regarded as reasonable. These estimates were derived from project lifetime estimates of tax costs.

Response No. 149 (continued)

ALASKAN GAS PIPELINE AND LNG PLANT

ESTIMATED ALASKA CORPORATION INCOME TAXES
(amounts in thousands of 1973 dollars)

| Facility (Basis: 3.2 Bcf/D) | Estimated State Corporation Income Tax Annual | Lifetime (25 years) |
|---|---|---|
| Pipeline | $12,000 | $300,000 |
| LNG Plant and Terminal | 11,200 | 280,000 |
| Total | $23,200 | $580,000 |

It should be noted that these estimates are of a preliminary nature. The taxable profits upon which the tax is to be assessed are a function of the operating company's debt-equity ratio, applicable investment credits, current operating and capital costs, depreciation policies, and the like. Profits will be derived only from providing transportation services; the Applicant does not propose to generally engage in the business of purchasing and reselling North Slope natural gas.

(b) The public service cost estimates contained in Table 3A.4-11 were derived from the Alaska State Legislature's Special Petroleum Impact Committee 1974 Impact Report on Trans-Alaska (Oil) Pipeline Construction, pp. 8-17. The incremental costs associated with Alyeska served as the basis for estimating the incremental costs that would be associated with the El Paso project. All public service costs estimates have been revised in accordance with the adjusted population projections contained in Tables A-1 and A-2 of Appendix A and are discussed in Sections 2.2 and 3.2.

Response No. 149 (continued)

(c) The assumption that disposable income is approximately 80 percent of wages is based upon the periodic studies of consumer budgets prepared by the Bureau of Labor Statistics, U. S. Department of Labor. Summaries of these budget analyses are printed in the Annual Statistical Abstract of the United States for high, medium, and low income families. These studies show that approximately 15 to 18 percent of gross income (primarily wages and salaries) is deducted as personal income tax withholdings and social security contributions. In addition, union dues, hospitalization insurance premiums, and other compulsory deductions take another 5 percent of gross pay. The estimate of 80 percent was judged a reasonable average.

(d) The assumption that one-half of the after-tax construction payroll in the South Coastal Study Area would be spent locally is based primarily on analyses of construction workers' spending behavior on major energy development projects in the lower 48 states. It is estimated, for example, on nuclear power plant projects, that construction workers maintaing households with in commuting distance of a project tend to spend on the order of two-thirds or more of their disposable incomes in the "project area," *i. e.*, the area lying within convenient commuting distance of the job site. (Disposable income is defined in the response to Question 149 (c).) In contrast, workers whose homes are beyond commuting distance often live in bachelor quarters near the site--motels, camper trucks, trailers, and boarding-houses--and thus only visit their families on weekends or less

Response No. 149 (continued)

frequent occasions. These workers spend locally on the order of one-fourth or less of their take-home pay; most is sent home for family support.

An analogous situation is projected for the Trans-Alaskan Gas Project, except that instead of indivdual bachelor quarters being obtained by the transient workers, the Applicant will provide group quarters in construction camps for both them and local residents hired on the project. In the present study, the concept of "project area" is expanded to include the entire South Coastal Study Area. Worker expenditures within this area are considered "local," and are estimated to account for about two-thirds or more of permanent resident workers' take-home pay and one-fourth or less of the transient, nonpermanent residents' disposable income.

Specific data on current worker spending patterns in Alaska are not available. Thus it was necessary to conduct the expenditure analysis on the basis of experience in the Lower 48. In order to project the general magnitude of local income effects of project construction activities in the South Coastal Study Area, it was assumed that one-half of the construction workers maintained households and supported dependents in the Study Area while the remainder were out-of-state, transient workers without local households. On the basis of observed behavior on energy projects in the lower 48, as described earlier, the combined spending patterns of the two groups would result in an average of about one-half of the disposable income from the construction payroll accruing to the Study Area.

Response No. 149 (continued)

(e) Use of a factor of 1.5 for the income multiplier from project expenditures and payroll was based on an assessment of the Alaskan economy with respect to the degree of interdependence between economic sectors and geographical areas. While the economy is developing rapidly, there is still a high degree of reliance on external sources of supply for durable and nondurable goods, technical services, and capital. The impact of these factors is manifested in a high rate of "leakage," which tends to dampen rapidly the recycling of new dollars (in this case, project payroll spending) injected into the local economy.

The study of prospective impacts of the Alyeska oil pipeline by the University of Alaska's Institute of Social, Economic, and Government Research, "Alaska Pipeline Report" (Fairbanks, 1971) addressed the question of the magnitude of the multiplier in a note to the section on secondary impacts of Alyeska project; the note is reproduced verbatim (ibid, p. 116):

> It is in order to dismiss here the common notion that income or employment multipliers for "basic industries in Alaska are in order of 2 or 5 or 7. There is no basis, empirically or theoretically, for such large figures. "Multiplier" concepts, whether Keynesian or "economic base" models, depend on the proportion that is respent within the region of funds generated by sales of its products or services outside. Generally, multiplier coefficients are calculated as the reciprocal of the rate of "leakage"--the proportion of increments in those outside funds that leaves the regional income stream through savings, taxes, remittances of wages, interest and profits to nonresidents; and imports of goods and services from outside the regions. For instance, if 5 percent of incremental income directly generated by export industries like oil and gas is

Response No. 149 (continued)

> saved, 20 percent is diverted by federal taxes, 5 percent leaves the region in factor payments to non-resident corporations and indivduals, and half the remainder is spent on goods and services from outside, the total rate of "leakage" is 65 percent; this figure implies a multiplier coefficient of 1.54. In view of the small size of Alaska's economy, the high degrees of absentee ownership, the transient character of much of its labor force, and its dependence on imports, it is hardly conceivable that total leakages from income increments are less than 65 percent (which implies a multiplier coefficient of no greater than 1.54).

(f) The number of school age children was calculated using the assumption that the age distribution characteristics of an area in 1970 would be applicable to the projected total population increases. Thus, for example, the number of children aged 6 through 18 in 1970 for Fairbanks was 24.7 percent of the total 1970 population for Fairbanks. Table 11 shows a projected 1979 population of 78,300 for Fairbanks, including the Trans-Alaska Gas Project. Thus the 1979 school age population will be about 20,100 (as reported in Table 17), *i. e.*,

1979 Fairbanks Population = 78,300

x Percent of School Age Children (24.7) = 19,340

The school age population as a percentage of the total population was calculated from age distribution material available in the article, "Alaska's Population and School Enrollments," Review of Business and Economic Conditions, University of Alaska, Institute of Social, Economic, and Government Research, December 1971, Vol. VIII, No. 5.

Using this assumption, the derived projection may overstate the school age population. The age distribution of Fairbanks in 1970,

Response No. 149 (continued)

for example, probably included more school-age dependents than would be the case in 1979. Construction of the Alaskan Gas Pipeline is more likely to attract single persons or married couples without children than large families. The 1970 figures reflect a fairly stable community which was not experiencing the kind of in-migration that is likely to occur by 1979. As stated, the estimates, then, are conservative.

El Paso Alaska Company
FPC Docket Nos. CP75-96, *et al*
Data Request of 2/7/75

Question No. 152

What are the expected increases in sales tax revenues (and how are these estimated)? (2A.7-20)

Response No. 152 (Rev. 2, 7/25/75)

Sales tax revenues may be estimated by calculating the direct wage and salary payments that will be made during the construction and operation periods and by estimating the proportion of disposable wage and salary income that will be expended in the state on taxable goods and services. Throughout this analysis, it is assumed that a minimum of 50 percent of disposable wage and salary income during the construction period will be spent in Alaska with the balance being spent out of state.[1/] During the operational period of the project, it is assumed that the disposition of personal income will parallel national consumption patterns as recorded in the Survey of Current Business.[2/] Major taxable expenditures are noted below and comprise 56 percent of the total consumption budget.

| Consumption Item | Percent of Total Consumption | Percent Expended In State |
|---|---|---|
| 1. Food | 22 | 22 |
| 2. Services (exclusive of utilities) | 40 | 20 |
| 3. Durables | 14 | 14 |
| Totals | 76 | 56 |

Total expenditures for labor in the Arctic Study Area (as opposed to the Interior Basin and South Coastal Study Area) will amount to approximately $78.1 million over the 1977-1981 construction period.

1/ See response to Question 149d.

2/ U. S. Department of Commerce, Survey of Current Business, Vol. 55, #1, January 1975, p. 12.

Revised Response No. 152 (Continued)

Disposable income, calculated as 80 percent of this amount,[3/] will be about $62 million, an in-state personal consumption expenditures are expected to approximate $31 million. As noted in Section 3A.2.5.5.4, consumption expenditures in the Arctic Study Area proper will be minimal. For the purpose of estimating sales tax revenues, it is therefore assumed that the expenditure of personal income derived from North Slope construction will be split evenly between Fairbanks and Anchorage.[4/]

With taxable goods and services constituting 56 percent of total personal expenditures, combined sales tax revenues in the City of Fairbanks and the Fairbanks North Star Borough will approximate $520,000 over the entire construction period. This figure is calculated below, using a 4 percent rate, recognizing that the current sales tax rate is 5 percent in the City of Fairbanks and 2 percent in the Borough.

Estimated expenditures in Fairbanks area, 50% x $31 million
= $15.5 million;
Multiplier effect, 1.5 x $15.5 million = $23.25 million;
Estimated expenditures subject to tax, 56% x $23.25 million
= $$13.02 million;
Estimated sales tax revenues, 4% x $13.02 million = $520,000.

During the operational period, gross wage and salary earnings for Arctic area personnel are estimated at $1.1 million. Annual disposable income for wages and salaries earned in the Area will average about $880,000 and will result in an estimated $15,000 in the City of Fairbanks and North Star Borough sales tax revenue per year. This figure is calculated on the basis of the consumption patterns outlined above and again assumes total expenditures split evenly between Anchorage and Fairbanks.

3/ See response to Question No. 149c.

4/ There is no sales tax in Anchorage.

Response No. 152 (Continued)

Estimated expenditures in Fairbanks area, 50% x $0.88 million = $0.44 million;
Multiplier effect, 1.5 x $0.44 million = $0.66 million;
Estimated expenditures subject to tax, 56% x $0.66 million = $0.37 million;
Estimated annual sales tax revenues, 4% x $0.37 million = $15,000.

Wage and salary income from construction activities in the Interior Study Area has been estimated at $194 million with 50 percent of this expected to be remitted out of state. Personal income expenditures in state (after taxes) will thus approximate $77.6 million, and again it is expected that this amount will be apportioned equally between the Fairbanks and Anchorage areas.

Projected sales tax revenues during the construction period will thus be about $1.3 million, calculated as follows:

Estimated expenditures in Fairbanks area, 50% x $77.6 million = $38.8 million;
Multiplier effect, 1.5 x $38.8 million = $58.2 million;
Estimated taxable expenditures, 56% x $58.2 million = $32.6 million;
Estimated sales tax revenues, 4% x $32.6 million = $1.3 million.

Wage and salary income from operational activities in the Interior Study Area totaling $2.3 million per year, is expected to yield $1.9 million in disposable income and estimated annual sales tax revenues of $32,000. This figure assumes that 100 percent of all operational income is expended in state, one-half in Fairbanks and one-half in the Anchorage area.

Construction activities throughout Alaska will generate an estimated $230 million in local spending in the South Coastal Study Area,[5/] and it is assumed that about 38 percent of this amount ($88

5/ Assumes that 25% of Arctic and Interior Study area workers' disposal income is spent in Anchorage.

Response No. 152 (Continued)

million) will be expended in the Cordova-Valdez area where the current sales tax rate is 4 percent.[6/] Sales tax revenues are projected to amount to some $2.96 million during the entire construction period, as calculated below:

Estimated expenditures in Cordova-Valdez area, 38% x $230 million = $88 million;
Multiplier effect, 1.5 x $88 million = $132 million;
Estimated taxable expenditures, 56% x $132 million = $73.9 million;
Estimated sales tax revenues, 4% x $73.9 million = $2.96 million.

During the operational period, disposal wage and salary income in the South Coastal Study Area[7/] will amount to about $7.8 million, of which an estimated $3.7 million of 47% will be spent in the Cordova-Valdez area. This spending will give rise to approximately $243,000 in annual sales tax revenues.

Estimated expenditures in Cordova-Valdez area, 47% x $7.8 million = $3.7 million;
Multiplier effect, 1.5 x $3.7 million = $5.5 million;
Estimated taxable expenditures, 56% x $5.5 million = $3.1 million;
Estimated sales tax revenues, 4% x $3.1 million = $123,000 per year.

In summary, the estimated sales tax revenues to be generated by personal income expenditures in the state are:

Construction period - $4,780,000 (total)

Operational period - $170,000 (annual)

With respect to tax revenues, it should also be noted that the induced population growth and commercial activity resulting from project

6/ There is no sales tax in the Anchorage area.

7/ Assumes that 50% of Arctic and Interior Study area pipeline operating personnel's disposal income is spent in Anchorage.

Response No. 152 (Continued)

construction and operation will generate sizeable excise tax revenues (alcohol, cigarettes, etc.) as well as state revenues from motor vehicle taxes, fuel taxes , and business and occupational license fees. Not included in the above estimates are the sales tax revenues that will be derived from the local and in-state procurement of taxable project supplies, materials, and services.

Total sales tax revenues are thus likely to exceed the total estimate presented above.

El Paso Alaska Company
FPC Docket No. CP75-96
Data Request of 2/7/75

Question No. 161

A footnote in reference to education states, "The District is 90 percent state-funded" (3A.3-23). What is the source for the remaining 10 percent?

Response No. 161

Listed below are the sources of funds for the Fairbanks North Slope Borough School District:

| Source of Funds | 1973-74 (Audited) | 1974-75 (Working) |
|---|---|---|
| Local Revenues | $ 622,597 ( 4.19%) | $ 1,010,108 ( 5.16%) |
| State Sources | 11,728,547 (79.01%) | 13,380,015 (68.37%) |
| Federal (direct to District) | 806,339 ( 5.43%) | 750,172 ( 3.83%) |
| Federal (thru State) | 476,370 ( 3.21%) | 393,100 ( 2.01%) |
| Local Appropriation: | | |
| Regular | 1,210,971 ( 8.16%) | 1,957,787 (10.00%) |
| One-Time Impact | - 0 - | 2,079,478 (10.63%) |
| Totals | $14,844,824 | $19,570,660 |

Explanation: Local Revenues - adult education fees, rental of facilities, tuition, cafeteria profits, etc.

State Sources - a number of small special funds plus the so-called foundation funds. The Alaska law states that the state will fund 90 percent of the basic educational costs. This is not 90 percent of the total costs, as can be seen in the '73-'74 figures above. However, it is the major support received by the District.

Federal - these are various programs whose funds are submitted directly to the district and/or through the Alaska Department of Education.

Response No. 161 (continued)

Local Appropriation - the direct local appropriation, derived primarily from real property taxes, is shown as the "regular" amount in the above table. The "one-time impact" funds are primarily state funds ear-marked to alleviate the current impact due to construction of the Alyeska oil pipeline.

The trend will be for the state to pay a larger share of the basis educational costs. HB 131, Public School Foundation Programs, is presently (March, 1975) before the legislature and is predicted to pass easily. This bill would increase the basic support by the state from 90 percent to 93 percent.

El Paso Alaska Company
Docket Nos. CP75-96, *et al*
Data Request of 2/7/75

Question No. 164

In reference to public safety, the application assumes 300 persons per policeman in one place and in another place assumes 440 persons per policeman. Why is a different ratio used? Also, what is the recommended state standard for persons per policeman.

Response No. 164 (Rev. 7/25/75)

The different ratios for police protection used in the original text were the existing police-to-population rations for two geographical areas in 1973, as reported in the State of Alaska Criminal Justice Plan, 1974. Table 164-A shows the breakdown for Fairbanks and Anchorage. Two ratios are presented in the table; one includes support personnel in the police-to-population ratio, and the other excludes them. The original report was inconsistent in that in Section 2A.7.4.2 .2.4, support personnel were not included for the Fairbanks Police Department for computation of the police-to-population ratio, while in Section 2A.7.5. 2.2.5, support personnel were included in the Anchorage Police Department. As a result, the ratio of 330 used for Anchorage is misleading.

Police protection in Alaska is provided by the Alaska State Troopers and municipal police forces. The overall state responsibility belongs to the Alaska State Troopers. This agency handles law enforcement needs outside the towns and villages which have separate police departments. The Alaska State Troopers (AST) covers a very large area which has poor transportation; furthermore, the AST must conduct all civil process work, investigations of industrial accidents, coroner duties, and mental health referrals in addition to the usual criminal law enforcement duties. The problems of transportation also mean that, outside of the urban areas, law enforcement in Alaska is mostly crisis-response. In Alaska, at least 7 men are needed to keep 1 man on duty 24 hours per day.[1/] As a result, it is probable that more than 1 policeman per 500 persons are needed if the AST is to combine preventive law enforcement activities with crisis-response.

1/ Personal communication, Captain Robert Penman, Operations Commander, Alaska State Troopers, Anchorage, Alaska, March 20, 1975.

Response No. 164 (Revised 7/25/75)

In addition to the AST, most cities and towns have their own police forces. Anchorage and Fairbanks have the largest such departments, and they have been able to maintain a ratio of 1 policeman per 500 persons, the accepted standard for police coverage.[2/] However, the jurisdiction of these departments ends at the city limits.

Using the projected population associated with the gas pipeline (see Section 3A.2.5.1.1), Table 164-B presents the additional manpower needed to maintain a ratio of 1 policeman for each 500 persons in the population, the guide for police planning by the AST. By necessity, adherence to this standard may have to be relaxed in the bush. Indeed, present coverage of bush areas, where AST detachments are at about 1 police officer per 2,000 population, does not approach this standard.

A recent indication of the impact of the Alyeska Oil Pipeline is evident in the declining police-per-population ratios. The Anchorage Police Department now has a total of 162 full-time policemen and at least a population of 88,000 to patrol, or a ratio of 1 policeman to 543 persons. In Fairbanks, approximately 27,000 persons are now covered by 43 full-time policemen, or a ratio of 1 to 630, compared to 1 to 486 in 1973. There is a similar trend in the Alaska State Troopers. For example, Detachment I had 43 troopers in 1973, and only 35 troopers in 1974. The high salaries of other jobs are attracting many troopers to other jobs.

2/ O. W. Wilson and Ray Clinton McLaren, Police Administration, 3rd ed. McGraw-Hill Book Company, New York, 1972.

TABLE 164-A

PUBLIC SAFETY MANPOWER FOR 1973

| | Police Personnel | Population | Ratio of Population To Police |
|---|---|---|---|
| FAIRBANKS NORTH STAR BOROUGH | | | |
| Fairbanks Police Department | | | |
| Full-time Policemen | 50 | 24,280 | 486 |
| Auxiliary Police | 20 | | |
| | 70 | 24,280 | 347 |
| Alaska State Troopers | | | |
| (Detachment I) | 43 | 21,672 | 504 |
| TOTAL POLICE | 113 | 45,952 | 407 |
| Support Personnel | | | |
| Fairbanks Police Department | 21 | | |
| Alaska State Troopers | | | |
| (Detachment I) | 15 | | |
| TOTAL LAW ENFORCEMENT PERSONNEL | 149 | 45,952 | 308 |
| GREATER ANCHORAGE AREA BOROUGH | | | |
| Anchorage Police Department[1/] | | | |
| Full-time Policemen | 143 | 80,108 | 560 |
| Auxiliary Police | 80 | | |
| | 223 | 80,108 | 359 |
| Alaska State Troopers | | | |
| (Detachment C) | 48 | 34,213[2/] | 713 |
| TOTAL POLICE | 271 | 114,321[2/] | 422 |
| Support Personnel | | | |
| Anchorage Police Department[3/] | 67 | | |
| Alaska State Troopers | | | |
| (Detachment C) | 30 | | |
| TOTAL LAW ENFORCEMENT PERSONNEL | 368 | 114,321 | 310 |

1/ Includes 28,000 persons in Spenard.

2/ Excludes 24,436 persons in Elmendorf Air Force Base and in Fort Richardson, for whom on-base military police protection is provided, plus some off-base patrol activity.

3/ The original ratio of 330 used for Greater Anchorage Area Borough was calculated by using the Total Police for the area plus the 67 Support Personnel of the Anchorage Police Department. Neglecting the 30 support personnel of Detachment C of the Alaska State Troopers raises the population to police ratio to 338.

Source: Alaska Criminal Justice Plan, 1974. State of Alaska, Juneau, Alaska, April 12, 1974.

TABLE 164-B [Revised 7/29/75]

PROJECTED ANNUAL PUBLIC SAFETY MANPOWER INCREMENT[1/]
FOR 1977-1983 WITH THE TRANS-ALASKA GAS PROJECT

| Unit | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 |
|---|---|---|---|---|---|---|---|
| Anchorage Police Department | 1 | 9 | 29 | 46 | 47 | 40 | 40 |
| Fairbanks Police Department | 1 | 4 | 6 | 6 | 6 | 4 | 4 |
| Alaska State Troopers | 6 | 25 | 50 | 62 | 56 | 47 | 47 |
| Detachments I and H[2/] | 1 | 5 | 6 | 5 | 5 | 4 | 4 |
| Detachment C[3/] | 5 | 20 | 44 | 57 | 51 | 43 | 43 |

1/ The coverage assumed is 1 policeman per 500 persons and represents the additional manpower needed over normal growth requirements (without T-AGP) to maintain that ratio.

2/ Detachments I and H have responsibility for the Arctic and Interior Study Regions (City of Fairbanks excluded).

3/ Detachment C has responsibility for the South Coastal Study Region (City of Anchorage excluded).

C

# APPENDIX C

## REVISED TABLES

TABLES:

2A.7-1
2A.7-2
3A.3-7
3A.3-8

TABLE 2A.7-1 (Revised July 1975)

BASELINE POPULATIONS FOR CENSUS DIVISIONS, 1970-1977

| Place | 1970[1/] | 1974[2/] | 1977[3/] |
|---|---|---|---|
| Northwest | | | |
| Barrow | 2,663 | 2,600 | 3,800 |
| Kobuk | 4,434 | 4,500 | 4,600 |
| Nome | 5,749 | 5,800 | 5,900 |
| Northern Upper Yukon[4/] | 335 | 1,700 | 1,200 |
| Total | 13,181 | 14,600 | 15,500 |
| Interior | | | |
| Southern Upper Yukon[4/] | 1,349 | 1,700 | 1,500 |
| Fairbanks | 45,864 | 49,000 | 71,700 |
| Southeast Fairbanks | 4,179 | 4,500 | 6,500 |
| Yukon-Koyukuk | 4,752 | 5,500 | 5,400 |
| Total | 56,144 | 60,700 | 85,100 |
| Southcentral | | | |
| Cordova-McCarthy | 1,857 | 2,000 | 2,000 |
| Valdez-Chitina-Whittier | 3,098 | 5,000 | 8,200 |
| Matunuska-Susitna | 6,509 | 8,000 | 6,900 |
| Kenai-Cook Inlet | 14,250 | 14,100 | 14,300 |
| Kodiak | 9,409 | 9,500 | 10,000 |
| Seward | 2,336 | 2,500 | 2,400 |
| Anchorage | 126,333 | 165,000 | 225,800 |
| Total | 163,792 | 206,100 | 269,600 |
| Other | 69,244 | 75,800 | 102,800 |
| Alaska | 302,361 | 357,200 | 473,000 |

1/ Department of Commerce.

2/ Department of Labor, 1974 (mid-year).

3/ Derived from HRPI/URSA, 1974 (Appendix Table B-18).

4/ The Upper Yukon Census Division has been divided into a Northern Section (North of Brooks Range) and a Southern Section. Thus, Kaktovik, Deadhorse, and Prudhoe Bay are in the Northern Upper Yukon Sector, while such communities as Fort Yukon, Stevens Village, and Evansville (Bettles) are in the Southern Upper Yukon Section.

TABLE 2A.7-2 (Revised July 1975)

BASELINE POPULATION PROJECTIONS FOR PROJECT STUDY AREAS, 1970-1977

| Study Area | 1970 | 1974 | 1977 |
|---|---|---|---|
| Arctic[1/] | 3,000 | 4,300 | 5,000 |
| Interior[2/] | 52,600 | 57,200 | 83,000 |
| South Coastal[3/] | 130,080 | 170,000 | 232,900 |
| Other (Non-Study) Areas | 116,681 | 125,700 | 152,100 |
| Total Alaska | 302,361 | 357,200 | 473,000 |

1/ Arctic includes the northern part of the Upper Yukon Census Division and all the Barrow Census Division.

2/ Interior includes the southern part of the Upper Yukon, the Fairbanks and Southeast Fairbanks Census Divisions, and the northern 40% of the Valdez-Chitina-Whittier Census Division. The portion of the Valdez Census Division includes accounts for communities in the Copper River Valley (Gulkana, Glennallen, Copper Center, etc.).

3/ South Coastal includes the Anchorage, Cordova-McCarthy and southern 60% of the Valdez-Chitina-Whittier Census Divisions.

Source: Table 2A.7-1, Figure 2A.7-1 for boundaries of study areas.

TABLE 3A.3-7 (Revised July 1975)

BASELINE POPULATION PROJECTIONS FOR SELECTED CENSUS DIVISIONS ALONG PIPELINE CORRIDOR, WITHOUT TRANS-ALASKA GAS PROJECT, 1977-1983
(Thousands of Persons)

| Place | Year | | | | | | |
|---|---|---|---|---|---|---|---|
| | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 |
| Anchorage | 225.8 | 230.1 | 233.0 | 233.9 | 235.3 | 238.7 | 243.9 |
| Fairbanks | 71.7 | 73.1 | 74.0 | 74.3 | 74.7 | 75.8 | 77.5 |
| Cordova-McCarthy | 2.0 | 2.0 | 2.0 | 2.1 | 2.2 | 2.3 | 2.4 |
| Other | 173.5 | 176.8 | 179.0 | 179.7 | 180.8 | 183.2 | 187.2 |
| Total Baseline Population | 473.0 | 482.0 | 488.0 | 490.0 | 493.0 | 500.0 | 511.0 |

Note: Totals may not add due to rounding.

Source: Derived from HRPI/URSA (1974) and Department of Labor (1974) projections of population in South Coastal Area after completion of Alyeska oil pipeline.

TABLE 3A.3-8 (Revised July 1975)

POPULATION PROJECTIONS FOR SELECTED CENSUS DIVISIONS ALONG UTILITY CORRIDOR, WITH TRANS-ALASKA GAS PROJECT, 1977-1983
(Thousands of Persons)

| Place | Year | | | | | | |
|---|---|---|---|---|---|---|---|
| | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 |
| Anchorage | 226.7 | 239.1 | 262.0 | 279.9 | 282.3 | 278.8 | 284.0 |
| Fairbanks | 71.8 | 75.8 | 78.3 | 78.5 | 78.8 | 79.1 | 80.8 |
| Cordova-McCarthy | 2.4 | 6.8 | 9.1 | 7.5 | 4.2 | 4.1 | 4.2 |
| Other Alaska | 173.1 | 179.3 | 180.6 | 181.1 | 182.7 | 185.0 | 189.0 |
| Total Impact Population | 474.0 | 501.0 | 530.0 | 547.0 | 548.0 | 547.0 | 558.0 |
| Baseline Population[1/] | 473.0 | 482.0 | 488.0 | 490.0 | 493.0 | 500.0 | 511.0 |
| Change due to Alaska Project | 1.0 | 19.0 | 42.0 | 57.0 | 55.0 | 47.0 | 47.0 |

1/ Derived from Tables 3A.3-3, 3A.3-4, 3A.3-5, and 3A.3-7.

BIBLIOGRAPHY

Alaska State Department of Community and Regional Affairs, Personal Communication with John B. Chenoweth, Director, April 8, 1975 (details on state pipeline impact financial assistance).

Alaska State Department of Community and Regional Affairs, Alaska-Taxable, Juneau, Alaska, January, 1974.

Alaska State Department of Labor, Annual Population and Employment Projections, 1961-1980, Juneau, Alaska, March 1974.

Alaska State Legislature, General Appropriations Act, SLA, 1973, 1974.

Alaska State Legislature Special Petroleum Committee, Report on Impact of Trans-Alaska Pipeline Construction on Government Services and Facilities, Juneau, Alaska, February 12, 1974.

Alaska State Legislature, "Oil and Gas Exploration, Production Pipeline Transportation Property Tax Law," Laws of Alaska, AS.43.56, Juneau, Alaska.

Bureau of School Services, College of Education, University of Arizona, "Cordova Alaska School Study: School Population Projections, Analysis of Existing Facilities, Determination of Facility Needs, Development of Educational Specifications," (Tucson, undated).

El Paso Alaska Company, Application of El Paso Alaska Company at Docket No. CP75-96 for a Certificate of Public Convenience and Necessity, Dated: September 23, 1974, Filed: September 24, 1974.

El Paso Alaska Company, First Supplement to Application of El Paso Alaska Company for a Certificate of Public Convenience and Necessity, Docket No. CP75-96, Dated: March 1, 1975, Filed: March 3, 1975.

El Paso Alaska Company, Proposed Direct Testimony and Proposed Hearing Exhibits, at Docket Nos. CP75-96 et al, Dated and Filed: March 24, 1975.

El Paso Alaska Company, Preliminary Survey: The Potential Market in Alaska for North Slope Natural Gas, by Gordon S. Harrison, Ph.D., Alaska Editorial Services, Fairbanks, Alaska, March 1975.

El Paso Alaska Company, Response to Data Request of February 7, 1975, FPC Docket No. CP75-96.

El Paso Natural Gas Company, Trans-Alaska Gas Pipeline LNG Project, Executive Summary, July 22, 1974.

Human Resources Planning Institute, A Forecast of Industry and Occupational Employment in the State of Alaska, Seattle, Washington, April, 1974.

BIBLIOGRAPHY
(Continued)

Human Resources Planning Institute, and Urban and Rural Systems Associates, Manpower and Employment Impact of the Trans-Alaska Pipeline, Seattle, Washington, November, 1974.

Institute of Social, Economic, and Government Research University of Alaska, "Estimated Gross State Product for Alaska," Review of Business and Economic Conditions, Fairbanks, Alaska, April, 1974.

Los Angeles Times, "Alaska Coast Village Girds for Oil Rush," July 22, 1975.

Wall Street Journal, "Alaska Pipeline's Estimated Cost is Boosted Again," June 23, 1975.