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DEVELOPING PREDICTIVE INDICATORS OF COMMUNITY AND POPULATION CHANGE

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NOTICE

Alaska OCS Socioeconomic Studies Program
Developing Predictive Indicators of Community and Population Change

Prepared By
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PREFACE

This project does not directly study the impacts of OCS developments. In fact, it is largely based on data derived from impact experiences associated with the construction of the trans-Alaska pipeline. For this reason, an explanation of the relationship of the project to the overall Alaska OCS Socioeconomic Studies program (SESP) is in order. The primary goal of the SESP is to predict and evaluate social, economic and physical changes expected to result from OCS developments. Predictions at the community, regional and statewide levels are all of interest. Changes resulting from OCS development can be expected to result from an interaction of outside forces (examples: population, employment and service demand increases) with community and personal characteristics. Thus, before we can predict and evaluate change we must search for answers to a series of questions about the nature of the development and the nature of the communities the development may affect. These questions include:

- What are the outside forces for change?
- What types of social, economic and physical changes can occur?
- What individual and community characteristics can be expected to interact with outside forces to produce local impacts?
- t-low can measures of individual and community characteristics and measure of outside forces for change be combined to produce a prediction of impacts?

- How are the predicted impacts to be evaluated?

Each of the above questions describes a key subgoal of the SESP. The Predictive Indicator Study touches on all of the subgoals but from the perspective of non-OCS impact experiences. Let us consider each question in order to establish the position of the Predictive Indicator Study in the SESP.

WHAT ARE THE/OUTSIDE FORCES FOR CHANGE?

Population and employment increases caused by an energy project are obvious outside forces for change. Another is the physical presence of the development itself, including its attendant demands on land and services. The current study does not attempt to refine our definition of forces for change in the areas of employment and physical development demands.

The study does address the meaning of projected population increases. It is hazardous to assume that new residents in a community will have the same mix of preferences as existing residents. If preferences differ, service demands and public pressures for growth are likely to vary as well. The impact experiences of Fairbanks and Valdez permit us to compare immigrants and residents for differences in such things as attitudes toward growth and the provision of public services, consumption patterns for housing and other major items, family size and numbers of children in different age categories. These observed differences are clearly influenced by the fact that most workers associated with developments in the case study communities were located in self-contained camps. We assume similar types of enclave developments will continue to be used in Alaska. The Fairbanks and Valdez experiences, therefore, may provide a useful set of initial observations on the differences between immigrant and resident populations.

Studies of actual impact experiences are necessary to test the importance of possible changes. The only Alaskan impact experiences that have been sufficiently documented to apply our study approach involve Fairbanks and Valdez. Some of the possible changes tested in the Predictive Indicator Study are changes in: direct and indirect employment, time use, consumption, personal satisfaction and changes in the quality of public and private services. We assume that the pipeline and OCS development experiences are similar.

WHAT INDIVIDUAL AND COMMUNITY CHARACTERISTICS CAN BE EXPECTED TO INTERACT WITH OUTSIDE FORCES TO PRODUCE LOCAL CHANGES?

This question defines the primary focus of the Predictive Indicator Study. We assume that community and individual characteristics influence the distribution and magnitude of effects set into motion by outside forces. We also assume that repeated applications of the research approach in other communities will demonstrate that a characteristic identified to be important in one community is likely to be important in other communities as well. The study attempts to identify specific characteristics that account for, or at least related to, observed changes. Some of the characteristics identified at the community level are: the presence of bondable contractors, the availability of local financing and the time required to obtain supplies to the community. At the individual level, marital status, reasons for living in the community, and age are examples of characteristics found to be related to specific types of change.

HOW CAN MEASURES OF INDIVIDUAL AND COMMUNITY CHARACTERISTICS BE USED TO PRODUCE A PREDICTION OF CHANGE?

Once a characteristic has been shown in several communities to consistently influence change, it is necessary to combine it with all of the other characteristics that influence the same type of change. For example, our results show that occupation, marital status, age, attitudes toward growth and several other characteristics appear to influence the likelihood of an individual becoming employed on an energy project. The proportion of blue collar workers, married couples, young adult residents and persons favoring growth in each community are likely to differ. The influence of each characteristic has to be considered in the context of all the other relevant characteristics. Our approach has been to attempt to empirically isolate the effects of each characteristic by studying actual impact experiences. In this way, the cumulative effects of varying mixes of characteristics can be estimated by adding up these unique effects.

The utility of the approach depends on whether we have correctly assumed that consistent, unique effects can be identified and that these effects can be added to produce accurate cumulative predictions of specific changes. These assumptions can be tested by repeated application of the research approach and comparisons of predicted and actual changes.

HOWARE PREDICTED IMPACTS TO BE EVALUATED?

Some researchers believe that the evaluation of impacts cannot be scientifically determined.[1] They suggest that evaluations should be based on well-established standards or on the political process. We assume that the ultimate judge should be the people who have experienced or expect to experience similar impacts. The approach adopted in the current study focuses on personal evaluations of past experiences. The risk in using past experiences is that the impact may not be comparable and the population affected may differ from the population to be affected by a new project. The risks associated with this approach have been reduced by taking advantage of differences in impact experiences and characteristics which occur naturally. In this way we have some idea how a variety of impact experiences are evaluated by groups of individuals with different characteristics.

In order to predict the impacts of OCS development, the relationships between forces for change and intervening variables must be known. Lacking any a *priori* reasons for assuming what the magnitudes and directions of these relationships are, we are forced to turn to direct observations. Our choices are further limited to actual impact situations that either can be observed or that have been adequately documented. In this imperfect set of circumstances the impact experiences of Fairbanks and Valdez are comparatively attractive as targets for research.

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[1] George C. Peterson and Robert S. Gemmell, Social Impact Assessment Comments on the State of the Art, in *Methodology of Social Impact Assessment*, Kurt Finsterbusch and C. P. Wolf (eds.), Dowden, Hutchinson and Ross, Inc., Stroudsburg, Penn., 1977.

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I. INTRODUCTION

The goal of the Predictive Indicator Study is to improve our ability to anticipate the social and economic effects of energy developments on Alaskan communities. The primary problem addressed by the research is that the same general type of energy development is likely to result in different changes among individuals and communities. This report presents results of research that attemptsto explain these differences. Our explanation is based on the idea that observable community and individual characteristics somehow influence the effects of outside forces of change.

We have drawn upon the oil pipeline impact experiences of Fairbanks and Valdez, Alaska to identify the relationships between community and individual characteristics that can be observed prior to impact on the one hand and impact experiences and assessments on the other. These relationships may be shown in future studies to apply to communities and individuals generally, or at least to apply to a large proportion of the population which may be affected by such energy developments. To the extent that the relationships appear to have a general application, they can be used in combination with observations of specific community characteristics and development forces to predict likely patterns of impact.

Research Objectives

The specific objectives of the Predictive Indicator Study are to:

- Refine the definition of outside forces for change beyond that of aggregate increases in population by describing the differences between the characteristics of immigrants to and residents of impacted communities.

- Identify some of the more important types of social, economic and physical changes that may occur as a result of energy developments.

- Identify individual and community characteristics that appear to affect the distribution and magnitude of these changes.

- Test the feasibility of using "natural experiments" in the form of case studies to accomplish the above objectives.

- Provide questionnaires and instructions for their use that will permit repeating and extending the research approach.

- Recommend a set of operational measures of community and individual characteristics that can be employed in base-line studies and for impact projections until they are modified or replaced by measures developed through further research.

Research Methods

We have employed two distinct sets of research methods to address the above objectives. In fact, the Predictive Indicator Study consists of two almost independent components, each involving its own set of characteristics and associated changes.

COMMUNITY LEVEL CHANGE COMPONENT

The first set of research methods, referred to as the Community Level

Change Component, addresses changes which are experienced by most residents equally. Examples include changes in public services, air quality and outdoor recreation opportunities. Five such community level changes were chosen for detailed study; these were changes in: health care, housing, retail sales, schools, and electric and telephone utilities. Community characteristics found to influence each of the five community level changes were identified by:

- First constructing a set of general characteristics thought to influence community change. The general characteristics included; 1) uncertainty about the energy project and community growth; 2) accuracy and credibility of information about the outside forces for change; 3) resources available to the community to respond; and 4) procedures that must be followed once the need for a response is identified.

- Testing the relevance and comprehensiveness of the four general characteristics through an analysis of observed community changes in Fairbanks, Alaska during the construction of the trans-Alaska oil pipeline.

- Constructing specific measures of community characteristics within each of the four general categories that are relevant to small communities. This was accomplished through extensive consultations with community experts in each of the five areas of community change subject to analysis.

- Testing the utility of the specific measures in field tests conducted in Homer, Seward, English Bay and Port Graham, Alaska.

INDIVIDUAL LEVEL CHANGE COMPONENT

The second major component of the Predictive Indicator Study addresses changes which vary greatly from person to person by attempting to identify important individual characteristics that influence the distribution and magnitude of such changes. The energy development experiences of the residents of both Fairbanks and Valdez provide the basis for the analysis. A separate analysis is run in each of two communities. This allows us to compare the results of one community analysis with the other. If the results are consistent--if we find out that in both communities certain changes are more likely to be experienced by individuals with the same characteristics--then we can be more confident that the results will help predict changes in other communities.

Two types of analysis are applied in each community. The first type of analysis addresses the changes experienced by existing residents as a result of outside forces for change. To do this, we perform a statistical analysis that makes use of the pre-impact characteristics of residents to predict their experiences in the impact situation. Both personal characteristics and experiences were then used to predict the assessments residents made of changes that occurred. The statistical analysis permits us to identify relationships between any two personal characteristics, experiences or assessments by observing the degree the two tend to vary in the same way. In other words, naturally occurring variations in personal characteristics, experiences and assessments are used as a basis to isolate causes of individual changes.

The second type of analysis shows the changes which result from the addition of new residents during the impact period. This analysis compares the characteristics and experiences of residents who were living in the communities in 1973 with the characteristics of experiences of persons who moved into Fairbanks and Valdez during the impact period of 1973-75. Both types of analysis are based on surveys conducted in the case study communities during the impact period.

Major Research Products

Ultimately, the research approach adopted in the Predictive Indicator Study should yield a set of practical tools that we can use to reduce our uncertainty about the relationship between development and change, but additional research in other communities and under different circumstances is still needed before the development of a well-tested set of practical tools can be expected. As a step in this direction, however, the report includes a set of field instruments (questionnaires) and instructions for their use and interpretation. The field instruments are based on our analysis of the impacts resulting from the construction of the trans-Alaska oil pipeline and in our judgment provide the best available tools for making impact projections at the community level.

More importantly, however, the set of draft field instruments and instructions should set the stage for further research efforts. The research approach described in this report is not definitive; it demands repeated application before we can comfortably expect consistent results. The field instruments provide a means for repeating the study approach in other communities and a base upon which new ideas can be tested. This brings us to the most important research product, which is a description of the research approach itself. Our development of predictive indicators of community and population change has consisted of a series of experiments in which hypothesized relationships between pre-impact and impact observations are tested. Many, but not all, of these experiments proved successful in the case study communities. By describing our methods and results we hope that future research efforts can profit not only from our positive results but also from the negative results as well.

Major. Conclusions of the Study

The following conclusions are drawn in the Community and Individual Level Change components.

COMMUNITY LEVEL CHANGE COMPONENT

- All four of the' general characteristics expected to influence community responses (uncertainty, information accuracy and credibility, resources and procedures) were found to influence community responses in the case study community.

- Uncertainty and information accuracy and credibility are general characteristics which will vary from project to project rather than from community to community. Therefore, they will not account for response differences in communities facing the same energy development.

- However, the ability of any community to respond to outside forces for change is overwhelmingly affected by the amount of uncertainty surrounding an energy project.

- While larger communities will generally be better able to respond to increased service demands than smaller communities, communities of approximately equal size will also differ in their ability to respond. Key community characteristics that appear to explain differences in response are: cost and feasibility of transporting supplies to the community, local availability of planning and management expertise and land that can be sold or leased for development.

- Local labor force characteristics are not always an important factor in rural community responses to service demands (note: we are not talking here about responses to employment opportunities in the development itself). New demands may be for entirely different types of services or goods than a community is equipped to provide. Construction involving public funds or unfamiliar construction techniques, for example, may require the developer to use bonded contractors who normally do not reside in rural communities.

o. Likewise, if the development is large, the availability of local financing is not likely to be important. Captial improvements for most rural services (examples: schools, utilities, health facilities) are not financed locally.

- If the development is small {example: a marine service base), specific local resources and procedures, however, should influence community responses,

- On the basis of interviews with experts in the service areas studies and field tests, a set of specific community measures has been developed and is available for baseline studies and further research.

INDIVIDUAL LEVEL CHANGE COMPONENT

- Each resident of a community is not equally likely to work on an energy project; personal circumstances and skills affect the likelihood of employment. A resident is more likely to work on an energy project if he or she: is married, does not have children at home, is young, has worked as a laborer, or is not a college graduate.

- The effect of personal attitudes on the likelihood of energy project employment is not as clear but we interpret the analysis results to show that a resident is more likely to work on an energy project if he or she: desires more personal economic benefits, desires more community growth or does not have a strong desire to live in a small town.

- Differences in the outside forces for change between two communities apparently affect the relationships between personal characteristics and personal experiences. If an energy project involves an administrative headquarters in a community, then residents with clerical skills are relatively more likely to work on the project.

- The results also suggest that the desire to lead a self-reliant, "Alaskan," life style does not make it less likely that a resident will work on an energy project.

- As expected, immigrants are much more likely (two to three times, in fact) to work on an energy project than residents.

- Residents are not equally likely to benefit from employment opportunities indirectly created by an energy project. Those that are more likely are: married, without children at home, male, young, not employed in a skilled white collar, laborer or service occupations and/or persons who are interested in more personal economic benefits, not strongly interested in small town living conditions, interested in leading a self-reliant life style and interested in more community growth.

- Immigrants, and not residents, are <u>more</u> likely to benefit from employment opportunities indirectly created by an energy project.

- Both direct or indirect employment related to an energy project appears to be important causes of increased time spent working. Marriage, being young, and/or being employed in a managerial or administrative occupation are also important in explaining which residents increase the time they devote to work.

- Immigrants are more likely than residents to increase the time spent working.

- Both direct and indirect employment related to an energy project increases the likelihood that a household will receive much larger incomes (increases of $10,000 or more) during the construction of an energy project.

- Female heads of household and married residents (that is, not single males) are less likely to experience fixed incomes or income declines. Although female heads of household tend to have lower incomes than others, an energy project apparently offers an opportunity to make greater relative gains in income.

- Immigrants are more likely than residents to experience either large increases in real income (adjusted for cost of living differences) or income declines.

- Increases in the time devoted to work significantly decreases the time residents spend: with family, visiting, on outdoor recreation activities and hunting and fishing.

- Large increases in income are not immediately translated into expensive purchases such as housing. Although immigrants are more likely than residents to experience large income increases, they are less likely to make large purchases.

- Seventeen specific types of perceived community changes show a significant relationship to residents' overall assessments of community change. These include changes in the quality of: schools, medical care, utilities, traffic congestion, outdoor recreation opportunities, and social relationships, among others.

- Personal satisfaction during the peak construction phase of an energy project is primarily dependent on work experiences related to the project and income changes. Residents who did not have such work or income experiences believe that they are bearing the costs of development.

- Decreases in the time spent with family, on leisure activities and on social relationships do not greatly affect personal satisfaction. While decreases in the time spent on these activities are experienced by many residents, they are accompanied by personal economic gains. Apparently large economic gains outweigh these social costs in the minds of community residents.

- Residents' attitudes toward community growth do not change greatly during the construction of the energy project but negative personal and community experiences appear to cause some reduction in the desire for more community growth.

- Immigrants appear generally to favor more community growth, but not necessarily more so than residents. Predevelopment measures of resident attitudes are necessary before it is possible to say that immigrants will increase pressures for community growth.

- Moving plans among residents do not appear to be greatly affected by an energy project.

Research Applications

The results of the Predictive Indicator Study serve to identify key community and individual characteristics that should be assessed in community baseline studies. In addition, the approach taken in the research provides a means of using these baseline measures to make predictions. While the study does not complete the task of developing a predictive capability for changes resulting from possible OCS developments in Alaska, it does significantly improve our understanding of how outside forces for change are translated into varying types and magnitudes of actual change.

Research Needs

A first step using a new research approach has been taken; the value of the research ultimately will depend on whether other major energy development experiences are monitored and whether the results of these efforts are used to further test and expand the relationships reported here. Additional research is particularly needed on changes in physical community conditions such as air quality and outdoor recreation opportunities. We were not able to address these areas in the current study. The links between objective community level changes and assessments of those changes should also be investigated. Another key research need is to identify the effects of ethnic background on personal experiences and assessments.

Much work has been done elsewhere to describe the outside forces for change associated with OCS developments. It is clear that these forces, including population and employment increases and new demands for land and services, are highly variable. Possible developments range from pipeline landfalls and service bases to marine terminals, gas processing and treatment plants and refineries. Our research has put aside for the moment the effects of different forms and scales of outside forces for change in order to focus on community and individual response differences given the same outside forces for change. It is now time to combine these perspectives, recognizing that development forces, community characteristics and individual characteristics all vary and all affect the changes that occur.

Organization Of The Report

The following chapter is devoted to a detailed discussion of the methods and results of the Community Level Change component of the Predictive Indicator Study. Chapter Three presents the methods and results of the Individual Level Change component. Chapter Four addresses three issues which arise from the preceding chapters. It begins with an evaluation of the research methods employed and of the relevance of Fairbanks and Valdez as OCS case study communities. The discussion then turns to the linkages between the two major study components. The remainder of Chapter Four identifies additional research needs. Chapter Five and Six contain the field instruments and instructions for the community and individual level operational measures. Both Chapters Five and Six include an illustration of the use of the operational measures in several communities on the Kenai Peninsula.

The report also includes several important appendices. Appendix A contains a general review of the development period in Fairbanks between 1968 and 1978. Appendix B chronologically profiles changes in five key service areas in Fairbanks over the same period. Appendix C presents a detailed comparison of the survey data compiled in Fairbanks and Valdez and Appendix D compares the characteristics of the residents of Soldetna, Homer, Seward, English Bay and Port Graham with those of Fairbanks and Valdez residents. Appendix E contains a discussion of some of the issues that were relevant to the choice of analysis techniques employed in the Individual Level Change component. Finally, Appendix F lists the names and titles of the experts consulted during the course of the Community Level Change component of the study.

II. METHODS AND RESULTS OF THE COMMUNITY' LEVEL CHANGE COMPONENT

As previously noted, the Predictive Indicator Study consists of two components; one focuses on changes which mainly vary among communities and the other focuses on changes which also vary among individuals. This chapter presents the methods and results of our analysis of changes expected to vary among communities. Intuitively, it is logical to suppose that communities will not respond identically to the same outside forces for change. It also makes sense to assume that some set of community characteristics is responsible for the varying community responses we expect to observe. Such community characteristics might include the presence and adequacy of specific community services, government and private organizations, and local financial resources.

The first and most obvious community characteristic that influences community responses to change from outside is the size of the existing community that is to experience the impact. The size of the community and the size of the proposed development will interact to determine how well the development is absorbed by the community. A larger community will generally be better able to absorb the effects of development than will a smaller community. This is because the development will take up a smaller proportion of the community's economy; immigrants will comprise a smaller proportion of the total population; more extensive services will be already available; in absolute terms more local people will be available to take development-related jobs. These and other advantages offered by a larger community are of obvious importance in predicting community response. Frequently, however, the development calls for a decision regarding the siting of some facility where the possible locations consist of a number of equal sized communities. This demand generates the need to identify community characteristics other than size which vary among communities and influence responses. We may also wish to evaluate whether a specific small community has the capacity to respond satisfactorily to development.

A realm of characteristics other than size exist which may distinguish between communities of equal size. These include, among others, the form of government, attitudes towards planning, community employment and unemployment, community population mobility, and the quality of transportation and communication links with the community. Such factors would intuitively appear to be related to the response of the community to development. In addition to such general community characteristics there are also specific characteristics of community services that would appear to be related to community response. A community that has a full range of well-functioning community services, all of which have excess capacity, and all of which are efficiently planned and managed, would seem more likely to be able to absorb development than would a 'community with inadequate and overstretched services that barely manage to keep going from crisis to crisis. Our purpose in the community component of this study is to try to identify both the general and the specific community characteristics that influence reponse to change. Analysis of existing development offers the opportunity to attempt to show <u>which</u> community characteristics influenced the response and <u>how</u> and <u>why</u> they did so. Identification of community characteristics that interact with outside forces for change to determine community responses will permit us to assess these characteristics in communities where development has not yet taken place but is a definite potential. Such analysis could yield predictions of both the relative and absolute capacity of specific communities to respond to development.

Fairbanks and Valdez are the only Alaskan communities with recent experience of major outside forces for change where information was systematically collected relating to these developments. Fairbanks and Valdez do not represent typical OCS development; fortunately, however, outside forces for change associated with OCS developments do not differ markedly from those associated with other forms of development. They consist of the creation of new industrial activity, new job opportunities, the introduction of new residents, new and increased demands for community services and new wage levels within the community. The parallels and discrepancies between OCS development and the development experienced in Fairbanks and Valdez are discussed in Chapter Four.

In the remainder of this chapter we shall explain how we made use of the development experiences of Fairbanks and Valdez to develop a means of predicting how communities will respond to change brought about by the impact of external factors. First we had to examine the material available for analysis to decide the appropriate focus for the research effort. Our next step was to try to identify from the Fairbanks and Valdez experiences broad categories of characteristics that interact with outside forces to influence the nature of community response to change. This stage represents an identification of conceptual categories associated with change. Next we documented actual community responses to change and then analyzed these profiles of change to discover causal relationships between response and community characteristics. By comparing the results of these two independent processes we were then able to ascertain whether the general conceptual categories that we had identified coincided with the specific causes of actual community response. Once the relevance of the conceptual categories was established, we had to develop specific measures of community characteristics that fit within the conceptual categories and that are appropriate to the small communities likely to experience OCS development.

Decisions on the Research Focus

Besides the more obvious impacts of industrial activity and population growth, two identifiable types of community change accompany development. The first is an increase in demand for a whole range of community facilities and services; this increase in demand is generated by population increase and the requirements of increased economic activity. The second community change engendered by development is the deterioration of the physical environment arising from pollution, increased congestion and incompatible and excessive use of resources. Both general types of change are, of course, composed of many specific community changes. A thorough investigation of both general types would require that we identify community characteristics that influence each specific community change. This was judged to be impossible with available project resources. Therefore, a decision had to be made whether to focus on only one or two specific community changes within both genera? types of change or whether to concentrate our efforts on only one of the two general types of change. We decided to focus on changes in community facilites and services.

In making this decision we were influenced by several factors. First, the impact period data base available for reanalysis referred to problems of service delivery and responses to increasing service and facility demands. Very little data on the deterioration of the physical environment existed; where it was mentioned it was subjective and conjectural rather than consisting of objective measures of change. The lack of objective data is probably related to the dispersed patterns of ownership, control and use which make it difficult to obtain relevant objective measures of change. The second factor influencing our decision is that most impact related legislation provides a means for enhancing growth by providing financial support for the expansion of services and facilities, rather than by attempting to limit the adverse effects of growth on the natural environment. Therefore, a research focus on services and facilities fits the current policy emphasis. Finally, communities in Alaska that are best able to expand facilities and services are not likely to also be the most sensitive to environmental pressures. This is because Alaskan urban environmental problems do not appear to be as critical as those resulting from pressures on subsistence and wilderness resources. Thus, a ranking of communities based on service and facility response capabilities is not likely to differ greatly from a ranking based on both service, facility and environmental change predictions.

Having decided to focus upon community response to changing service and facility demands, we had to select from the universe of all community services which ones would best serve our purpose. Once again, an exhaustive coverage of all community services would have outstripped the time and resource constraints of the project. We chose to concentrate on the following community services:

a) Housing

b) Schools

c) Retail trade

d) Health

e) Utilities - power and telephone

Our decision depended upon availability of data on the various services as well as other considerations. We wanted to look at a range of services that would be affected both by the increased industrial activity and by the community growth. We wanted to look at both publicly provided and privately provided services to find out whether different sectors were influenced by the same community characteristics. We also wanted to look at services that might receive differing demands from new community residents and from long-term residents. The five services chosen appeared to offer the best mix of areas for detailed study .

Our decision to concentrate on a limited number of community services contains a number of implications. The results of our work should improve our ability to predict the response of a community to increased demand for specific services. This prediction entirely ignores any damaging environmental affects of such growth and, therefore, does not reflect an overall assessment of a community's ability to cope with growth. It also ignores any consideration of whether forces for change <u>should</u> be introduced into depressed areas in the interests of obtaining a more even distribution of economic activity. The predictive indicators developed in this study will simply suggest which communities will be better able to respond to increased demands that affect specific community services. This has always been a major question associated with the decisions about where to locate new economic activity and about how much concern should be voiced about the location of a major development in a specific community.

Development of Conceptual Categories of Community Characteristics that Influence Change

Once the decisions to adopt a case-study approach, and to concentrate on identifying community characteristics that influence the response of a limited number of specific community services had been taken, the objective of the community level analysis had effectively been refined to identifying and providing means of measuring those indicators that can predict whether or not these specific community services can respond appropriately to sudden and rapid growth.

The first stage of the analysis involved a preliminary identification of factors associated with community and service response to development. This was accomplished through a general review of the pipeline development period in Fairbanks and through the development of lists of general factors affecting supply and demand in each of the selected services under normal market conditions (i.e. not a period of rapid growth). The latter was carried out through consultation with University of Alaska economists with the purpose of gaining an understanding of normal determinants of service response to demand. The period that we defined as the pipeline impact period for Fairbanks spanned ten years, from 1968 to 1978[1]. The review of the growth period was based on all available secondary sources: newpapers, journals, impact studies, local

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[1]Although construction of the Trans-Alaska oil pipeline did not commence until 1974, the existence of large oil reserves under the North Slope of Alaska was made public in 1968 and the potential for development of Fairbanks in connection with the exploitation of these oil reserves was immediately recognized. Construction of the pipeline was held up for an extended period by legal restraints arising from both the Native Land Claims Settlement and environmental concerns. Growth, in anticipation of the pipeline project, started taking place in Fairbanks from the time of the oil-field announcement. It is, therefore, necessary to include the years 1968 to 1973 in the project research since they were an integral part of the growth period during which community services had to respond to changing demand.

government planning documents and service data and reports[2].

Based on this preliminary review of the development period in Fairbanks, factors identified to affect service responses to increasing demand were grouped into four conceptual categories.

- Uncertainty
- Information Accuracy and Credibility
- Resources
- Procedural Criteria

Our next step was to test the validity of the conceptual categories by attempting to use them to explain specific service responses in Fairbanks during the energy development. Before embarking on the discussion of the specific results of these tests, however, we must define the four conceptual categories.

A. UNCERTAINTY

Our preliminary investigation suggested that uncertainty about the timing, the type and the size of development, combined with uncertainty about the number and nature of jobs that the development project would create significantly inhibited service response to community development in Fairbanks during the pipeline period. Additionally, uncertainty about the future of the community after completion of pipeline construction was also a significant intervening factor. Uncertainty arises in the absence of:

- Reliable and detailed information about the timing and extent of the development project;

'The preliminary review of the growth period is in Appendix A.

- Detailed information about the number and type of jobs that the project will create;

- Details regarding hiring policies for the project;

- Detailed data on the project operation needs after the initial construction period.

In order to identify, plan and implement appropriate responses to increased service demands due to sudden and rapid growth, a community needs advance information concerning the development project. Lead time is required to permit anticipatory planning and decision-making. Tentative information will be an inadequate basis for action. This will be true for both publicly provided and privately provided community services. Uncertainty arises from lack of a firm timetable for development - uncertainty about <u>when</u> the project will take place, or it results from the more fundamental question <u>if</u> the development will take place. Finally, if it is established that the project will take place and the schedule for development is firmly fixed, then, uncertainty may still arise from a lack of detailed information about the nature and extent of the project and the project's likely impact upon the community.

Where privately provided services are concerned, business decisions will reflect the state of certainty or uncertainty. The greater the uncertainty, the more cautious businessmen will be in decision-making. Investment climate is a direct reflection of the level of certainty or uncertainty. Uncertainty will mean that businessmen lack confidence in the reliability of adequate returns on investment. In a state of uncertainty, locally set interest rates will be likely to be high and conditions for investment loans will be restrictive. Individuals will be cautious about purchasing residences where re-sale may prove a problem because of uncertainty about the future of the community in the post-construction phase. Companies engaged in the development may have to provide company housing or guaranteed "buy back" policies. Uncertainty will also inhibit the response of either publicly or privately provided services to meet increased or anticipated demand. The greater the level of uncertainty, the less service development is likely to take place. In the public sector, lack of confidence in the development climate will be manifested in unwillingness to commit public funds to expand and extend services in anticipation of development activites.

B. INFORMATION ACCURACY/CREDIBILITY

The level of information is, of course, the inverse of the level of uncertainty, but there is another aspect of information that affects the extent to which it serves as the basis for planning and decision-making. Information may be accurate or inaccurate, and whether it is in fact correct or incorrect it is also perceived to be either right or wrong; correct information may be considered to be wrong and incorrect information may be considered right. This is the aspect of information accuracy and credibility. The purpose of generating predictions about the future is to serve as the basis for planning and decision-making. If the information is essentially correct it may serve as the basis for decisions about necessary service expansion, but it will only do so if it has credibility. If it lacks credibility it is unlikely to be acted upon. Then again, if the information is incorrect but has the credibility to serve as the basis for action, it is highly likely that the response it engenders will be inappropriate.

In the absence of official information about a development there will inevitably be unofficial speculation about the extent, timing and effects of a project. Once the project data is developed by the company or agency responsible for the project, that data will be assessed and will certainly come in for some criticism. There will be those who regard the official projections as too conservative, those who argue that they are excessive. Such criticisms will result from political, commercial, financial, environmental and other considerations. The important factor is the degree of credibility ascribed to these official figures once the immediate discussion of them has subsided.

In the wake of the official figures, and indeed sometimes in advance of them, estimates and projections will be generated and promoted by other interested individuals and groups. In the case of the pipeline, apart from the "official" figures produced for Alyeska Pipeline Service Company by Mathematical Sciences Northwest[3], other projections relating to pipeline employment and impact were generated by the University of Alaska[4], by the Alaska State Legislature[5], by local government units including the Fairbanks North Star Borough[6], and others.

The accuracy and credibility of the several projections varied. Different segments of the population placed more or less confidence in each estimate. This credibility of information played a role in deciding which figures were con-

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[3] Mathematical Sciences Northwest Inc., A Study of the Economic & Sociological Impact of Construction & Initial Operation of the Trans-Alaska Pipeline, 3 volumes, (MSNW Report 72-410-4, Sept. 1972, Seattle, WA)

[4] Arlon R. Tussing, George W. Rogers & Victor Fisher, Alaska Pipeline Report, (Institute of Social Economic & Government Research, University of Alaska, Fairbanks, 1971.)

[5] Alaska State Legislature, Special Petroleum Impact Committee, Report on the Impact of Trans-Alaska Pipeline Construction on Governmental Services & Facilities, (Alaska Legislative Council Legislative Affairs Agency, Feb. 1974.)

[6] Fairbanks North Star Borough, Fairbanks North Star Borough Oil Pipeline Impact Statement, January 1974.

sidered to be reliable enough to serve as the basis for planning the development of community services. The level of credibility of information influences both public and private decision-making. The greater the credibility of any particular information, the more likely it is that the information will serve as the basis for action. If the information that is credible is accurate, then decisions are likely to be appropriate, but where the credible information is incorrect the decision response may prove inappropriate.

Assessing the accuracy of predictions in advance of the project is a problem. Certain checks are, however, possible, such as whether the base'line data is correct, whether the assumptions are defensible and whether the methodology is sound.

The extent of credibility of predictions made in advance of a project can be fairly easily assessed, particularly in a small community. This can be accomplished by formal or informal sampling, by interviewing key personnel in the community or by content analysis of local media, where they exist.

The greater the range and variability of projections, the lower the level of credibility is "likely to be for any single projection, which will probably dampen" response to the projections. However, should several independent projections exist that are in substantial agreement, a process of mutual validation is likely to take place. It is likely that given this situation, the projections will command widespread credibility and will serve as the basis for community response. If these various projections have been made independently and all include correct baseline data, defensible assumptions and sound but varying methodologies, the likelihood that the predictions will prove accurate is greatly enhanced and responses based upon them are highly likely to be appropriate.

C. RESOURCES

The most obvious characteristic that influences a community's ability to respond to growth is the availability of resources - human, physical and financial - in the community. A small community with very limited resources may be unable to respond to the same extent as a larger and more diversified community unless the development climate can attract personnel and capital from elsewhere. To expand community services in anticipation of growth requires the planning expertise to foresee and accurately assess the likely magnitude of the expansion, and a decision upon the appropriate level of service to accommodate the expansion. Financial resources, either public or private, must be available to underwrite the cost of expansion until the revenues are generated to cover the cost. There is a need for business and entrepreneurial skills in the private sector services. There is a requirement for the necessary managerial skills to administer and operate the expanded services, and for the personnel, machinery and facilities to accommodate and operate them. Should new facilities be required, the community will require construction capacity and materials for the expansion.

Faced with the prospect of development, it is the <u>excess</u> resource capacity that exists which is the important factor. Managers or materials that are already fully committed cannot serve the development effort. This means that to calculate the resources available for development, one has to determine the total resources available and subtract from that total those resources that are already completely tied up.

D. PROCEDURAL CRITERIA

Our preliminary analysis of the expansion of services in Fairbanks during the pipeline period indicated that established procedural criteria are an intervening factor that inhibits the development and expansion of community services. Whether services are provided publicly or privately, each service has established procedures and timetables for planning and budgeting for the future. Any increased demand for services is responded to within the constraints of these planning and budgeting procedures and it is only when increasing demand is anticipated, planned for, and budgeted for in advance that procedural requirements do not act as constraining factors. More often, service expansion takes place to accommodate increased demand after the fact, and then the speed with which the expansion can take place is inhibited by the procedures which must be followed. This often results in frustration and criticism of the procedural requirements as being too bureaucratic. Privately funded services are, at least initially, less subject to procedural constraints than are publicly provided services because their planning and financing involve fewer decision-makers, but there are still Internal private constraints that take time to overcome. In the field of retail trade, for example, a branch store manager who recognizes opportunities for expansion in the face of increased demand will still have to convince the distant upper management of his company that such investment would be justified. A private housing contractor who anticipates increased housing demand and wishes to construct units to meet the demand will have to arrange private financing for the venture which will certainly involve a demonstration of its feasibility. Even when financing has been obtained, time will be required to develop the necessary designs and contracts for the service expansion to proceed, and even privately funded services will have to comply with community regulations. For example, housing and residential development are privately provided services. The development of housing proposals and obtaining financing are private business matters but the private developer becomes involved in community procedural criteria once permission is sought to go ahead with the proposed development. Then the developer has to meet the requirements of planning and zoning regulations, building codes, etc. Where such regulation of development exists, complying with the requirements takes time and so extends the time period necessary for service expansion.

Where publicly provided services are concerned, the potential for procedural criteria to inhibit community response to increased demand is greater. Decision-making about publicly provided service is entirely a public matter and is undertaken according to established procedures. Local government units have to budget in advance and present their budgets for public approval. In addition where capital expenditures are necessary to increase services it may be necessary to conduct a bond-issue election to gain public approval for the expansion program. Definite rules exist about the timing of the bond-issue elections, how long a notification period must elapse before the election can take place and so on. Such public decision-making takes time, and prevents rapid response to increased demand for services.

In constructing a predictive tool to measure the likely response of communities to sudden and rapid growth, one component that must be included in the tool is the extent of community regulation of service expansion and the time element required in meeting regulations and passing through the required procedures.

The four conceptual categories described above were identified to comprise the characteristics that interact with outside forces for change to determine community response. Having identified them, our next task was to verify their role in influencing community change by assessing their actual occurrence in community development. Should this verification provide positive results, then further development of the correlates of these conceptual categories will be performed at a later stage.

Test of Validity of Conceptual Categories

SERVICE PROFILES

For each of the chosen community services (Housing, Schools, Electricity, Telephone, Retail Trade and Health) detailed profiles were independently prepared describing their operation in Fairbanks during the pipeline period.[7] These profiles document changes in demand and supply over the period and identify any stages when the services experienced problems or difficulties during the 1968-1978 period. The profiles were developed by research assistants who were unaware of the conceptual categories that had been developed. The research assistants were required to draw upon all available documentary sources (newspapers, impact reports, planning documents, etc.) to produce as detailed a description of the services as possible. They were required to focus upon changes in demand for and supply of services. The resulting profiles describe the provision of specific services in Fairbanks from 1968 to 1978, highlighting and explaining them in terms of the explanations given at the time and documented. Accompanying the descriptive profiles are supply

[7] The profiles are contained in Appendix B.

and demand graphs for each of the chosen services[8]. Several possible measures of supply and demand exist for each of the services, which meant that we had to choose which particular measures to use for our analysis. The selected measures do not represent a comprehensive coverage of response but only the most useful. Since several of the graphic presentations of supply and demand are calculated on the basis of population, the population estimates for the Fairbanks area for the period 1968-1978 are presented in Figure 2-1. It should be noted that we were unable to rely on any existing population figures for the period since those available varied greatly and could not be verified. The only reliable estimates for the civilian population of Fairbanks were those resulting from the 1970 census. As part of the analysis of service supply and demand we therefore had to include a thorough reworking of population estimates for the period. More traditional methods of population estimation, such as extrapolation from school enrollments, housing counts, postal deliveries and employment statistics proved inadequate because of abnormalities associated with the pipeline impact. We extrapolated projections from many indicators and found a method based on the use of gross receipts for major grocery stores yielded the projection which appeared most consistent with known trends. Extrapolation based on some other indicators such as traffic counts significantly verified these estimates, giving us confidence in our population estimates.

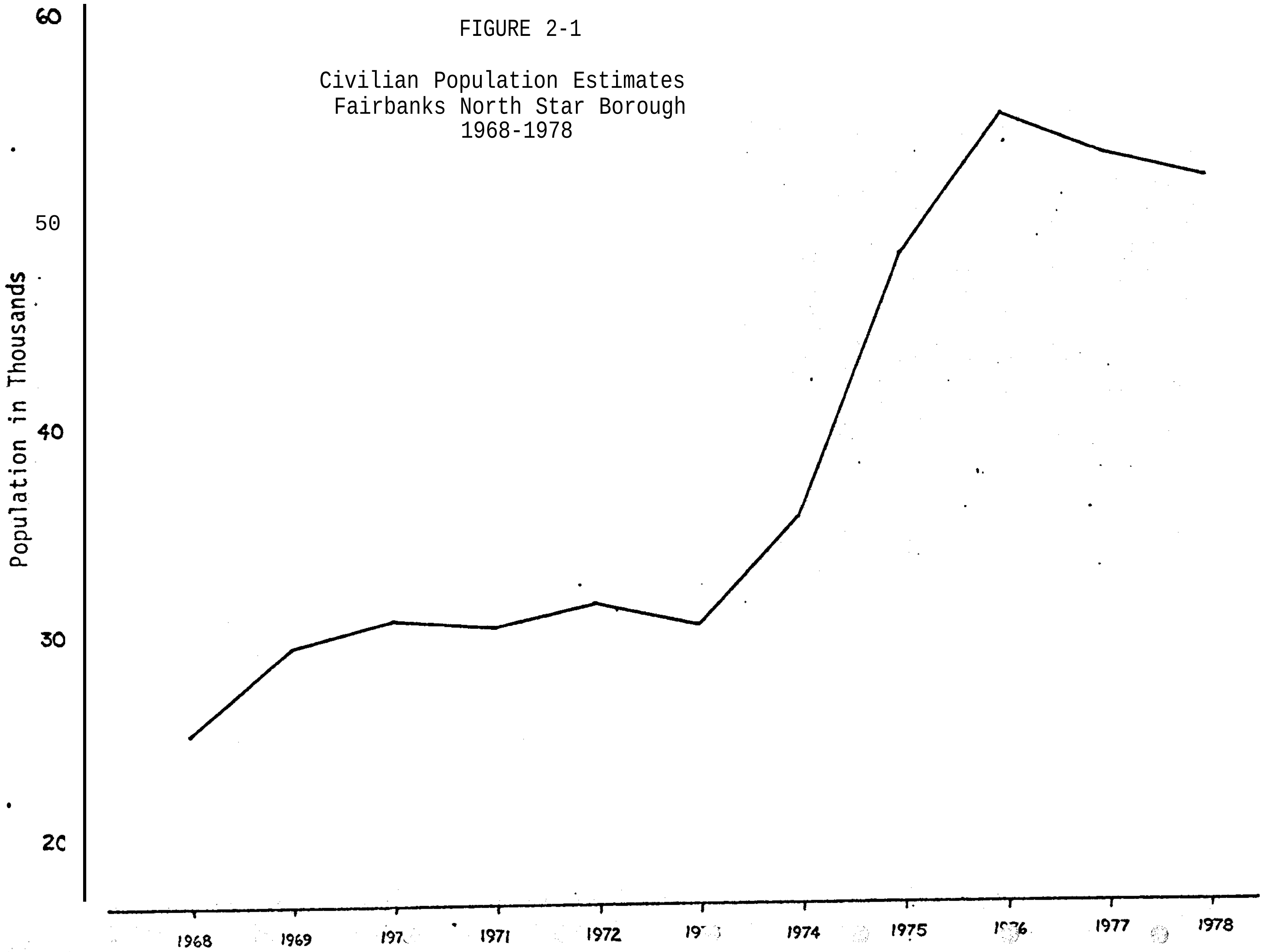
CLASSIFICATION OF RESPONSE

The next step in our research was to discover whether the broad conceptual categories that we had initially identified and developed could be shown to

[8]The graphs accompany our detailed discussion of each service response.

FIGURE 2-1

Civilian Population Estimates
Fairbanks North Star Borough
1968-1978



be of determining influence in the actual community change that we had documented. Our analysis involved reviewing the supply and demand graphs, first to establish the response of supply to demand for each of the five services. Response was classified into five categories:

- Satisfactory response - supply responded to increased demand without any deterioration of service;
- Inadequate response - some response of supply to demand but inadequate, resulting in service deterioration;
- Response failure - completely inadequate response of supply to demand resulting in crisis or breakdown of service.
- Over-response - response is too great, supply outstrips demand.
- No impact - no change identified in demand, situation remains as before.

Our aim was to identify instances of inadequate response, of response failure or of over-response. These we regarded as less than satisfactory response of supply to demand. Taking the supply and demand graphs we identified all those periods when such problems were encountered by the services under consideration.

Having identified such periods, we then turned to the profiles for explanation of the unsatisfactory responses to see if the explanations suggested that our conceptual categories represent the major influences accounting for the observed responses. This process we referred to as the limiting factor analysis for it pin-pointed those characteristics considered to have inhibited service responses to changing demand. The following paragraphs detail the results of the limiting factor analysis for each service area.

Housing

To measure the supply of housing in Fairbanks we relied upon several sets of data pertaining to the number of dwelling units. Our basic source was the 1970 census. We supplemented this data with figures gleaned from the Fairbanks North Star Borough and City of Fairbanks building permit records. Mobile home data was derived from sales receipts information and Department of Commerce and Economic Development figures on numbers of mobile home dealers. Using these sources we calculated the total number of dwelling units in the Fairbanks area for each year 1968-1978. The demand for dwelling units was calculated on the basis of population figures and the average Fairbanks household size (3.0 persons) established by the Alaska State Housing Authority. Supply and demand for housing in Fairbanks for the period 1968-1978 is shown in Figure 2-2.

During the period under consideration [1968-1978) supply and demand graphs show two periods of inadequate housing supply: from mid 1968-1970 the supply of dwelling units increased (there was a residential construction boom in 1969 with a 63% increase in building permits of 1968, and in 1970 a record number of residential building permits - 444 - were issued) but the supply was unable to keep up with the demands made by an influx of population anticipating an oil boom. The major characteristic that prevented supply from rising to meet demand was a lack of available investment capital (Resources: Financial)[9]. This was partially the result of a nation-wide economic down swing and par-

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[9]Throughout the limiting factor analysis discussion references to the four conceptual categories are underlined so that the reader can easily see the connection between our general categories and specific service responses.

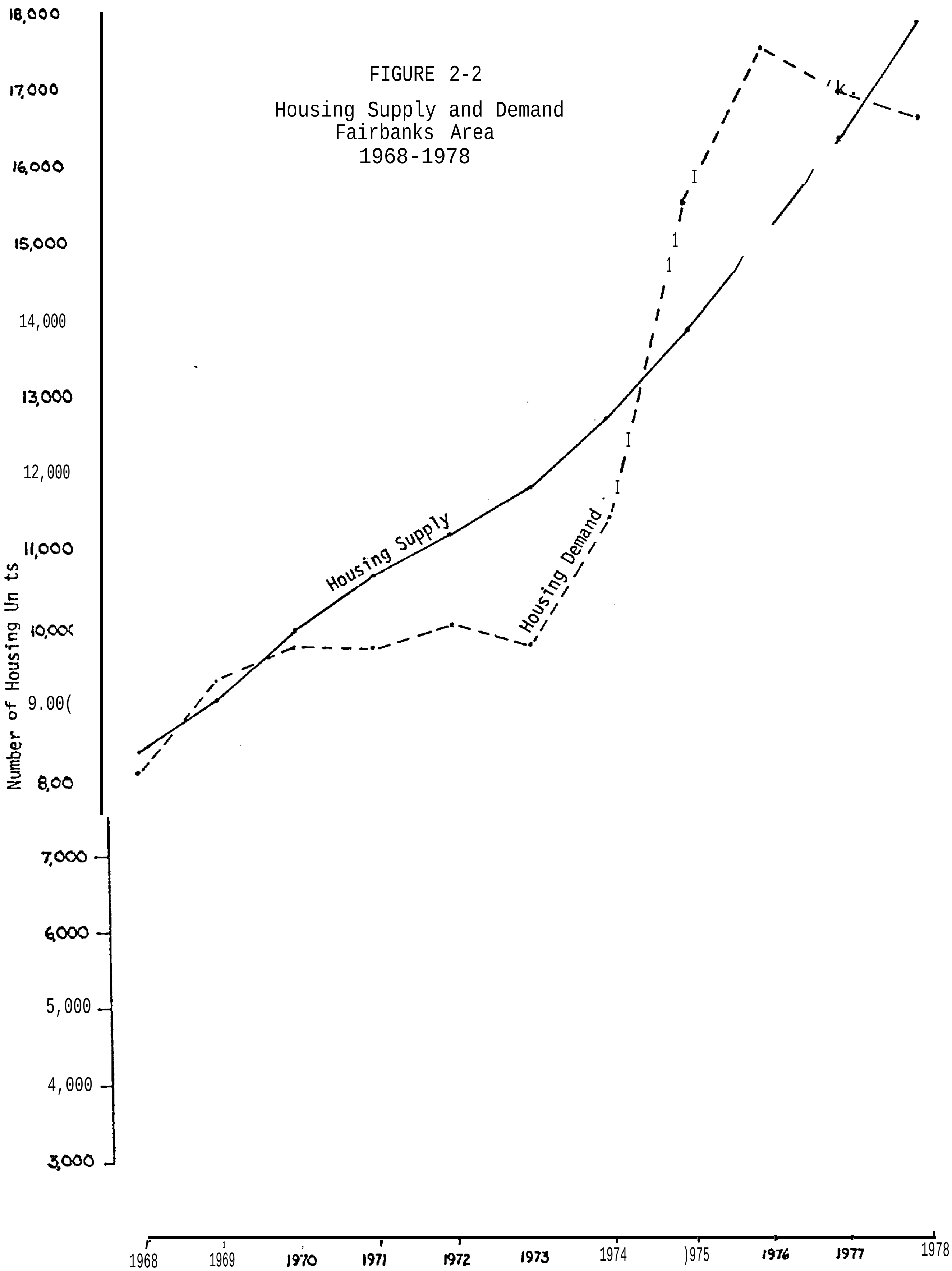


FIGURE 2-2
Housing Supply and Demand
Fairbanks Area
1968-1978
18,000
17,000
16,000
15,000
14,000
13,000
12,000
11,000
10,000
9,000
8,000
7,000
6,000
5,000
4,000
3,000
Number of Housing Units
Housing Supply
Housing Demand
1968
1969
1970
1971
1972
1973
1974
1975
1976
1977
1978

tially due to uncertainty about the potential oil development. Local government and the Chamber of Commerce did all they could to promote residential development including relaxing formal procedural requirements.

During the period 1970-1973 the population stabilized while housing supply continued to increase. Figure 2-2 shows an apparent over-response to existing demand during this period. This is partially a time-lag response to the increased demand in 1969-1970 and-partially reflects continuing demand for new units to replace substandard units. Increase in supply in this period was mainly in conventional single family units to meet the demands of the existing population. There was no advance construction program to anticipate potential demand for homes during the pipeline boom. The reasons given are Uncertainty about whether the project would go ahead and lack of accurate and credible projections of pipeline impact (Information Accuracy and Credibility).

Commencement of pipeline construction in 1974 precipitated an unprecedented population growth in Fairbanks which continued until 1976. As the supply and demand graph (Figure 2-2) shows, the housing supply continued to increase by more than 1,000 units per year in 1974, and for every year since then including 1978. The increase in supply, however, was inadequate to meet the demand and for this reason we regard this period (1974-1977) as characterized by a response failure. To some extent lack of response was due to lack of confidence about the housing situation after the pipeline construction boom would be over (Uncertainty). Lack of investment capital continued to be a problem (Resources: Financial), this too is linked to uncertainty about return on investment. Since increase in demand was so rapid, there was insufficient time for the need to be met with conventional construction. In addition, the housing shortage resulted in skyrocketing housing and rental costs which meant that many people could not afford to buy or rent conventional homes. As a result, there was a boom in the mobile home business, although this was somewhat constrained by lack of spaces for siting mobile homes (Resources: Land).

Local governments relaxed standards regarding siting of mobile homes for the duration of the crisis (i.e. Procedural Criteria were. made flexible to accommodate demand). In researching the effect of Procedural Criteria in Fairbanks we were told by several developers that during the peak pipeline period residential development efforts were constrained by resource problems: construction supplies were exhausted by the development effort and human resources, particularly skilled tradesmen, such as craftsmen, were difficult to keep since they were in short supply and were lured away by higher wages either on the pipeline or for other contractors (Resources: Physical and Human). One particular development effort, the project for a large mobile home park by Colombia Mobile Home Sales, was thwarted by two sets of procedural criteria. During the planning stage zoning restrictions limited the choice of locations for a big park. In the construction phase Department of Environmental Conservation regulations relating to sewage disposal caused a work stoppage for three months, which meant the project was not completed during the 1975 construction season. This was at a time when demand was peaking; by the time the project was completed demand had begun to subside as the pipeline construction neared completion (Procedural Criteria).

Housing demand began to fall after the 1976 construction season and continued to fall in 1977 and 1978 with the exodus of pipeline workers. Housing supply, however, continued to increase. The 1978 situation represents an over-response. The current (1978) level of supply would have been adequate for the 1976 peak population.

In summary, our analysis of the housing demand and supply graphs identifies two periods of inadequate service response to demand. Turning to our service profiles for explanation of these service failures we find evidence of the effect of all four of our conceptual variables (Uncertainty, Information Accuracy and Credibility, Resources and Procedural Criteria). We also find external factors (nationwide investment picture) affecting housing supply in Fairbanks.

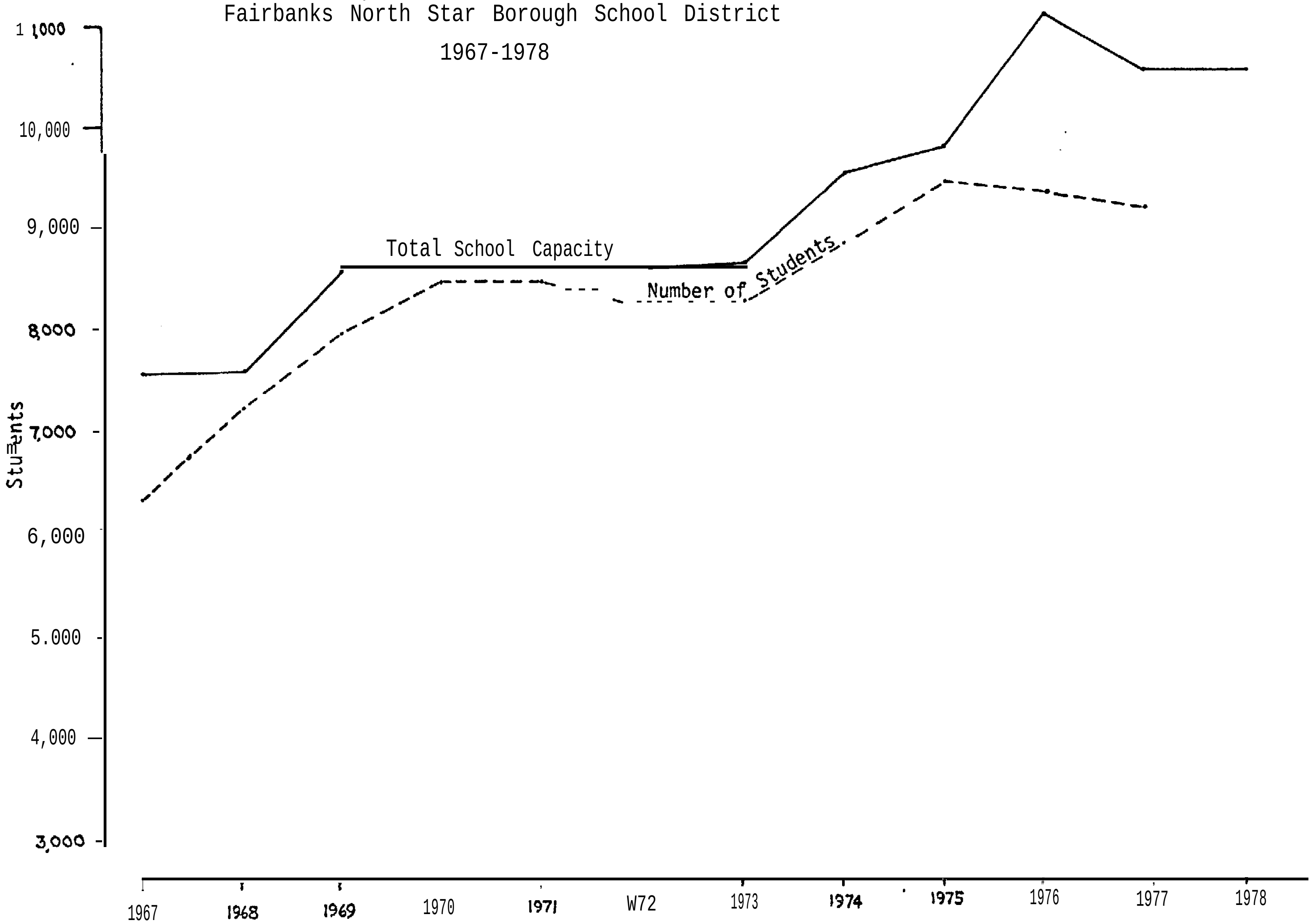
School S

School supply and demand are measured using school design capacity figures and enrollment figures provided by the Fairbanks North Star Borough School District administration.[10] School supply and demand are shown in Figure 2-3. The supply and demand graphs for school facilities in Fairbanks during the pipeline period demonstrate that the supply was able to keep up with the demand throughout the period. There was, according to the school administration figures, no . period when demand outstripped supply although there was little excess capacity during the 1970-1971 period (2 percent) or again during the 1973-1974 school year (3 percent). The graphs do not show overcrowding, but they are based on aggregate figures. Our profiles record that overcrowding was experienced in specific ’facilities during the period 1968-1971. In the anticipatory period 1968-1973 it was regularly argued that schools would be one of the most impacted and least prepared service sectors when the pipeline development came.

[10] School district figures exclude on-base schools and students.

FIGURE 2-3

School Capacities and Number of Students
Fairbanks North Star Borough School District
1967-1978



Although the school administration was continually engaged in planning new facilities during this period the electorate turned down the bond issues to finance any new facilities (Resources: Financial). The reason for this was that long-term Fairbanks residents were unwilling to bear the burden of capital cost for school construction intended to accommodate higher student enrollments generated by the pipeline development. Residents were also unsure about whether the new shools would be needed after the pipeline was constructed (Uncertainty). Not until the state accepted the responsibility for these capital costs was a school bond issue passed in Fairbanks (Resources: Financial).

School district planners predicted that the impact of pipeline construction on education in Fairbanks would be far greater than it in fact turned out to be (Information Accuracy and Credibility). They rejected the official projections, which were also in fact far beyond the real impact figures (Information Accuracy and Credibility).

Once construction of the pipeline began, the population increased and the state accepted responsibility for the capital costs of school construction, then supply was increased. The supply of classroom space increased so greatly that by 1976 supply far outstripped demand, a situation which is still the case in 1978. Supply was increased at a very high cost, being carried out at a time when the demand for construction activity was at a peak (Resources: Physical). If the predicted pipeline impact on education had occurred, the school system would have been overwhelmed; however, the impact did not occur to the extent predicted and supply was able to respond to meet this lesser demand.

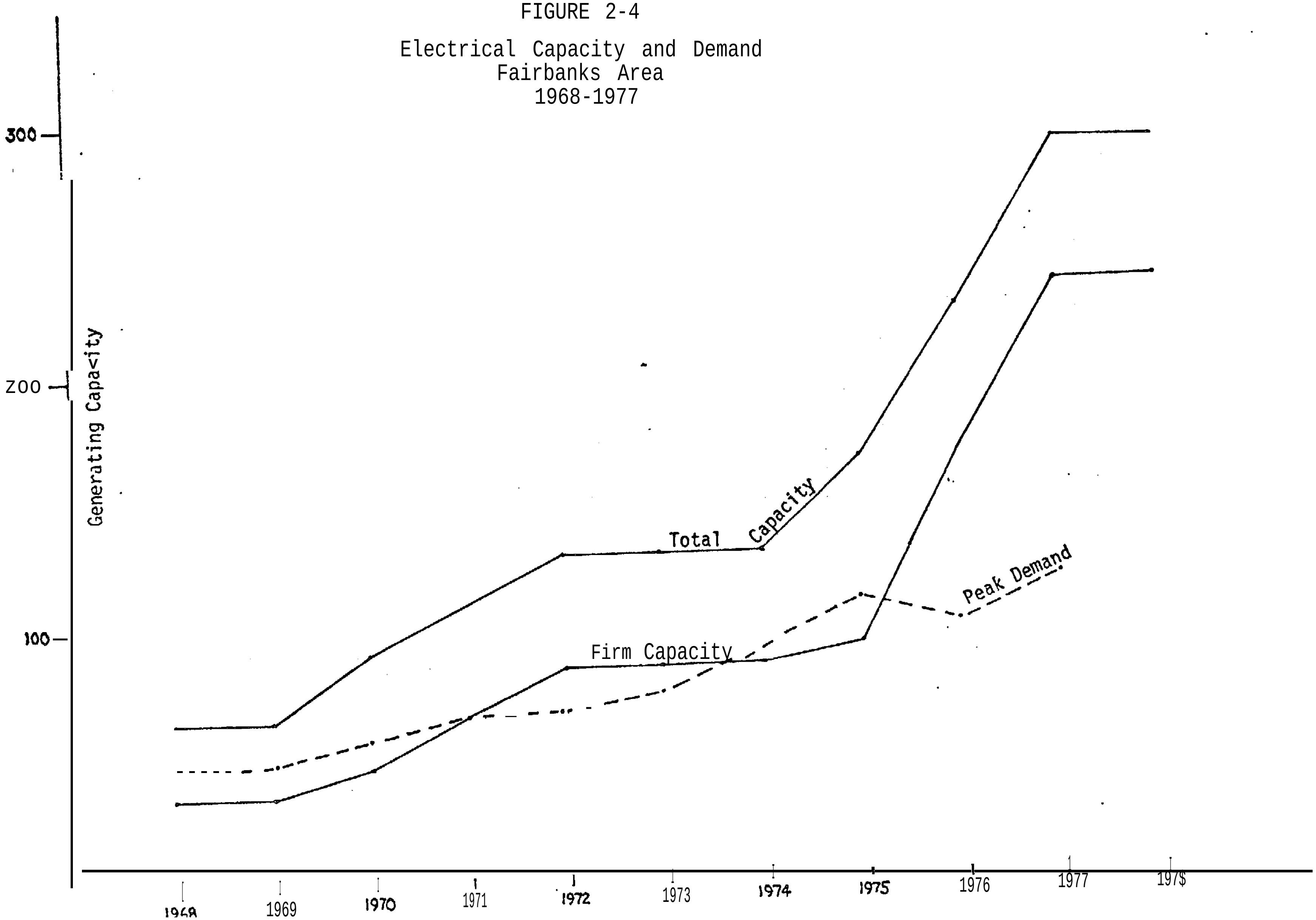
Utilities

- Electricity - The supply and demand graphs (Figure 2-4) for electrical power in Fairbanks during the pipeline period (1968-1978) show demand as actual consumption recorded by the two Fairbanks utility companies (peak demand) and show supply as firm capacity and total generating capacity. The total generating capacity required by a utility must permit it to meet peak electric demand even when the largest generating unit fails. System capacity when the largest unit fails is called "firm capacity." A utility's firm capacity must exceed peak demand to insure that needs can be met. For our analysis we are using firm capacity as the supply line. The graphs show that during the period 1968-1971 and again during the period 1974-1975 peak demand outstripped firm capacity in Fairbanks. In addition, during the winter of 1975-1976 both utility companies had to make use of peak load alerts, appealing to customers to limit their power usage and in some instances closing schools and public offices. During both these periods, 1968-1971 and 1974-1976, there was an inadequate response of supply to demand.

  Our graphs show that the electrical power situation was unsatisfactory at the commencement of our analysis period. This resulted from earlier unwillingness to finance increases in system capacity as well as problems arising from the Fairbanks flood of 1967. Turning to our profiles for explanations of the inadequate service response during the two identified periods, uncertainty about the reality of oil development is mentioned consistently for the first period. Unsure whether oil development would take place, utility managers, the city council

FIGURE 2-4

Electrical Capacity and Demand
Fairbanks Area
1968-1977



and the utilities board were cautious about embarking on expensive system capacity increases to serve the needs of a development period and a population that existed only as potential customers (Uncertainty). Instead, they tried to make good the deficiencies in the service to the existing population of real customers. Some increase in capacity did take place but it was in response to existing needs; neither the utilities' boards, nor the electorate were willing to authorize financing for an increase in supply to meet potential demand (Resources: Financial).

The period 1972-1973 is an interlude between the two periods of unsatisfactory response to increased demand. During the interlude population stabilized and demand did not increase significantly. This time, which could have been used for making the necessary preparations for coping with the pipeline associated demand, was not used because of uncertainty about whether the development would take place (Uncertainty). The utility planners and managers endeavored to make the necessary preparations to accommodate the increased demand prior to the construction phase but because of uncertainty about the future, financial resources were not obtainable (Resources: Financial). When the voters authorized an MUS Revenue Bond in 1972 to accommodate existing demand, it could not be sold because of city bond irregularities and a poor credit rating (Resources: Financial).

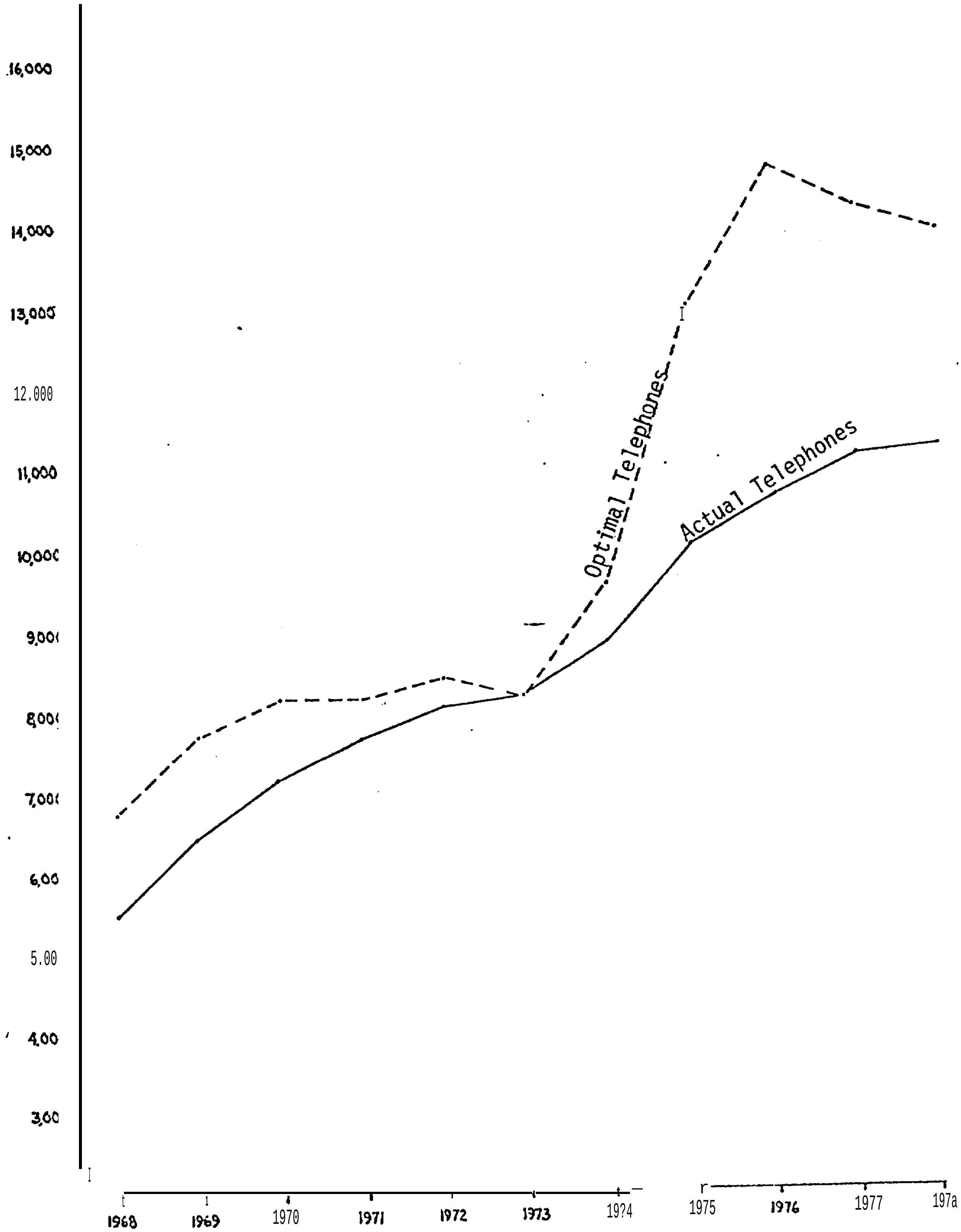
In 1974 the pipeline construction commenced and demand for electricity soared both for industrial/commercial uses and for residential use. Demand far outstripped firm capacity during 1974 and 1975. This directly resulted from a lack of anticipatory planning for the increased demand, arising from the earlier uncertainty (Uncertainty). During the development period one of the reasons for the lagging response to increased demand by both power utilities was the formal procedures through which they had to go to get a rate rise or to get public funds for expansion. It took almost two years (1974-1976) for the Alaska Public Utilities Commission to grant GVEA a requested rate increase, and four months for the Fairbanks City Council to grant MUS a rate hike (October 1975-January 1976) but this request had been too little and too late and another rate increase had to be requested in July 1976 (approved in September 1976). (Procedural Criteria). These problems resulted in a lack of financial resources for development (Resources: Financial).

During the peak of pipeline development demand, MUS experienced another problem that influenced service response: MUS could not keep a stable group of employees to maintain and operate its plant. Employees at MUS power plants were eager to obtain pipeline jobs, but they put in time at MUS while meeting pipeline eligibility requirements. As a result there was a very high level of turnover in MUS operation and maintenance employees resulting in many equipment breakdowns and failures (Resources: Human).

Only in 1976, after demand had peaked and was beginning to subside, did the utility companies succeed in increasing firm generating capacity to a level that could adequately have coped with peak pipeline demand. The lack of timely responsiveness of the electrical utility companies to increased demand was mainly a result of uncertainty and a lack of financial resources, but to a lesser extent was affected by the effects of lack of accurate and credible information for planning purposes, lack of human resources and inhibiting procedural criteria.

- Telephones - Figure 2-5 shows supply and demand for telephones. Supply of telephones is the actual number of residential main stations in existence during the period as reported by the two telephone companies. The demand for telephones was calculated on the basis of our population figures, the normal Fairbanks dwelling occupancy rate (3.0} and the assumption of an average of one telephone main station per household which is the norm used by the Fairbanks telephone utilities in calculating residential telephone demand, The graph showing demand and supply for telephone service in the 1968-1978 pipeline period demonstrates inadequate telephone service throughout the period. Only when a drop in demand was experienced in 1973 did the actual number of telephones coincide with the optimal number of telephones. For the rest of the period demand outstrips supply. In the period 1968-1973 the actual number of telephones did consistently increase at a rate comparable to the increase in demand, although never approaching the demanded number until the drop in demand in 1973. This period can be characterized as a period of inadequate response. The period 1974-1976 also shows an increase in supply, but the increase in demand so greatly exceeds increase in supply that this period can be characterized as a period of response failure, Even with the decline in demand illustrated for the period 1976-1978 the 1978 supply is still totally inadequate to meet the demand; thus, we should regard the whole 1974-1978 period as a response failure,

FIGURE 2-5
Optimal and Actual Telephones
Fairbanks Area
1968-1978



The telephone utility, more so than any other service considered in this study, was in such poor shape as to be totally unable to respond adequately to increased demand starting in 1968. The failure of the voters to pass a bond in 1965 meant that the telephone system was grossly inadequate at the outset (Resources: Financial). When a bond for telephone expansion was passed in January 1969 the situation had already become critical. A proposal for further capital improvement of the telephone system to be included in the Spring ballot in 1970 was defeated by the City Council. This 'defeat reflects the uncertainty about development that existed at that time (Uncertainty). Not until June 1972 was another bond passed for capital improvement of the telephone system, but this bond could not be sold due to the infringement of bonding ordinances and the generally poor financial situation of the MUS utility (Resources: Financial). The MUS utility had requested rate increases in 1971 but the Public Utilities Board, which reviewed city utility rate increase requests, insisted upon the completion of an in-house rate study prior to the increase and changes in the management of the telephone company (Procedural Criteria), only permitting the rate increase at the end of June 1972, by which time the telephone department of MUS was running a deficit. By 1973 it was bankrupt (Resources: Financial). The state government would not permit Fairbanks to use impact funds for upgrading the te"lephone system because, they argued, the crisis arose from poor planning prior to the pipeline impact (Resources: Human).

During the primary impact period (1974-1975) new telephone system equipment was added to alleviate the problems, but capital improvements to upgrade the system to meet demand took time to complete and were only completed after the peak had passed (Resources: Physical).

The failure of response by the Fairbanks telephone system during the pipeline period can be explained in terms of the inadequacy of the existing system at the outset. This was compounded by the lack of financial resources available to the system until too late for response to the increased demand. Although uncertainty and lack of human and physical resources play a small role in the lack of response, lack of financial resources was the major cause of response failure.

Retail Trade

Obtaining figures to calculate supply and demand for retail trade was more difficult than for any of the other services. Reliable retail trade statistics were not available for the whole period, therefore, we had to develop our own. This was only feasible for the period 1970-1978. No figures for 1968-1969 were obtainable. We were unable to obtain details of square footage of floor space for all retail outlets but we were able to gather these statistics for a sample of major retailers. Likewise, we were unable to obtain reliable figures for deflated gross sales for all retailers for the period, but we were able to compile these figures for major retailers. In our graph the supply represents percentage change in square footage floor space for major retailers. The major retailers were the source for this information. Demand is represented by percentage change in deflated gross sales of major retailers, as recorded in Borough records. We recognize that our graph only represents changes in supply and demand experienced by major retailers, but believe these to be highly correlated with changes in other sectors of retail trade also. Figure 2-6 shows retail trade supply and demand.

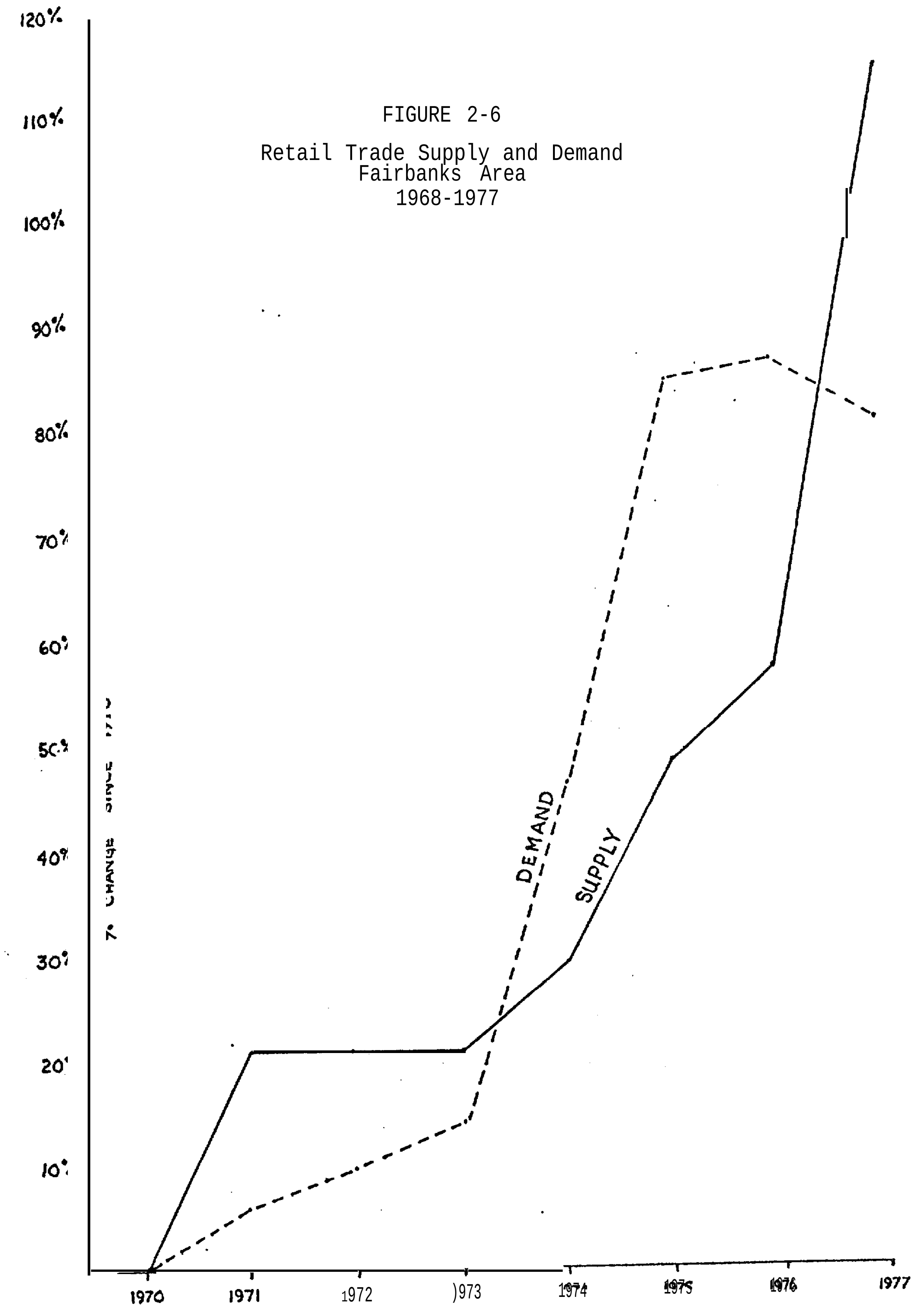
The supply and demand graphs for retail trade in Fairbanks during the pipeline period show two periods where response of supply to demand was unsatisfactory. The period 1970-1971 was a period of over-response, supply increasing proportionately considerably more than demand. The period 1974-1976 was a period of inadequate response of supply to demand: demand soared but although there was considerable increase in supply it did not match the increase in demand.

The profile explains the surge in supply in the early period (1970-1971) in terms of unsophisticated business people increasing their premises and inventory in hopes of profiting from a development boom. Investment decisions at this stage were not made on the basis of feasibility studies or careful analysis of the prevailing situation, but were more speculative. Many business people lacked the expertise to carry out sophisticated feasibility studies (Resources: Human). Much of the development in this period was carried out in response to the urging of the Chamber of Commerce who wanted Fairbanks to become the supply center for oil development. Because of the delay in pipeline construction, supply increased before the development materialized and many speculative investors suffered (Uncertainty, Information Accuracy and Credibility). As a result, the business community became very cautious regarding preparation for the possibility of development, unwilling during the period 1971-1973 to invest further.

The second period of inadequate response coincides with the pipeline construction. No advance preparation had been made for the demands of associated pop-

FIGURE 2-6

Retail Trade Supply and Demand
Fairbanks Area
1968-1977



ulation because of uncertainty about the development (Uncertainty). When the development became a reality business people began to plan expansion. Increasing retail capacity depends, however, on commercial development that takes time. The lead time required for planning and developing a shopping mall, for example, is probably two years or more. (Procedural Criteria). While the boom was taking place the business community was planning to expand. The large expansions came in 1976 by which time the boom was almost over. Construction of new commercial premises took place at the height of the development project when costs were inflated and resources were strained (Resources: Physical). Inadequate investment capital was available locally (Resources: Financial) so much of the development was by outsiders. During the pipeline boom the failure of the telephone system made business expansion difficult . (Resources: Physical). Turnover in employment in retail trade also presented a problem (Resources: Human). Supply was only able to catch up with demand when demand began to fall in 1977, meanwhile supply continued to soar during 1977 as demand fell.

In summary, uncertainty about potential development and lack of accurate information were major factors that affected both the early over-response of retail trade and the later lack of response. During the boom period procedural criteria and lack of human, physical and financial resources also played a part in the inadequate supply situation.

Health

To present an adequate picture of the changing supply and demand for health services we felt compelled to use more than a single indicator. There are, therefore, three separate supply and demand graphs for the health services: supply and demand for medical doctors (Figure 2-7), for dentists (Figure 2-8) and for hospital beds (Figure 2-9). Supply and demand for medical doctors is shown in terms of optimal and actual number of doctors for the Fairbanks area for the period. The optimal figures were derived by using national statistics relating to number of patient visits for particular specialties for different age and sex groups. These ratios were then applied to existing Fairbanks area population age and sex distribution, extrapolated back to 1968. This measure was developed in cooperation with health planners in the Fairbanks area. A similar method was employed to calculate the optimal number of dentists for the Fairbanks population (demand) while actual number of dentists practicing in the area yields the supply figures. Figures for the supply and demand for hospital beds were more easily obtained as bed occupancy statistics are routinely calculated by hospitals. Supply of hospital beds is recorded along the horizontal axis of the graph, while demand is shown by occupancy rates. To show the relationship of supply to changing demand for the hospital beds the graph also shows the optimal occupancy rate, 80 percent, which is the national optimal standard for hospitals in urban areas. In determining supply adequacy, we are regarding occupancy in excess of 80 percent as indicative of shortage.

At no stage during the pipeline period did Fairbanks experience a dentist shortage (Figure 2-7). At the outset of the period there were 13 dentists practicing in the area, while the application of optimal standards called for 12. A very satisfactory relationship between demand and supply obtained. Between 1968 and 1973 the supply of dentists increased to 23 while calculated demand rose to only 14, so there was a surplus of dentists in the Fairbanks

FIGURE 2-7

Actual and Optimal Number of Dentists
Fairbanks Area
1968-1978

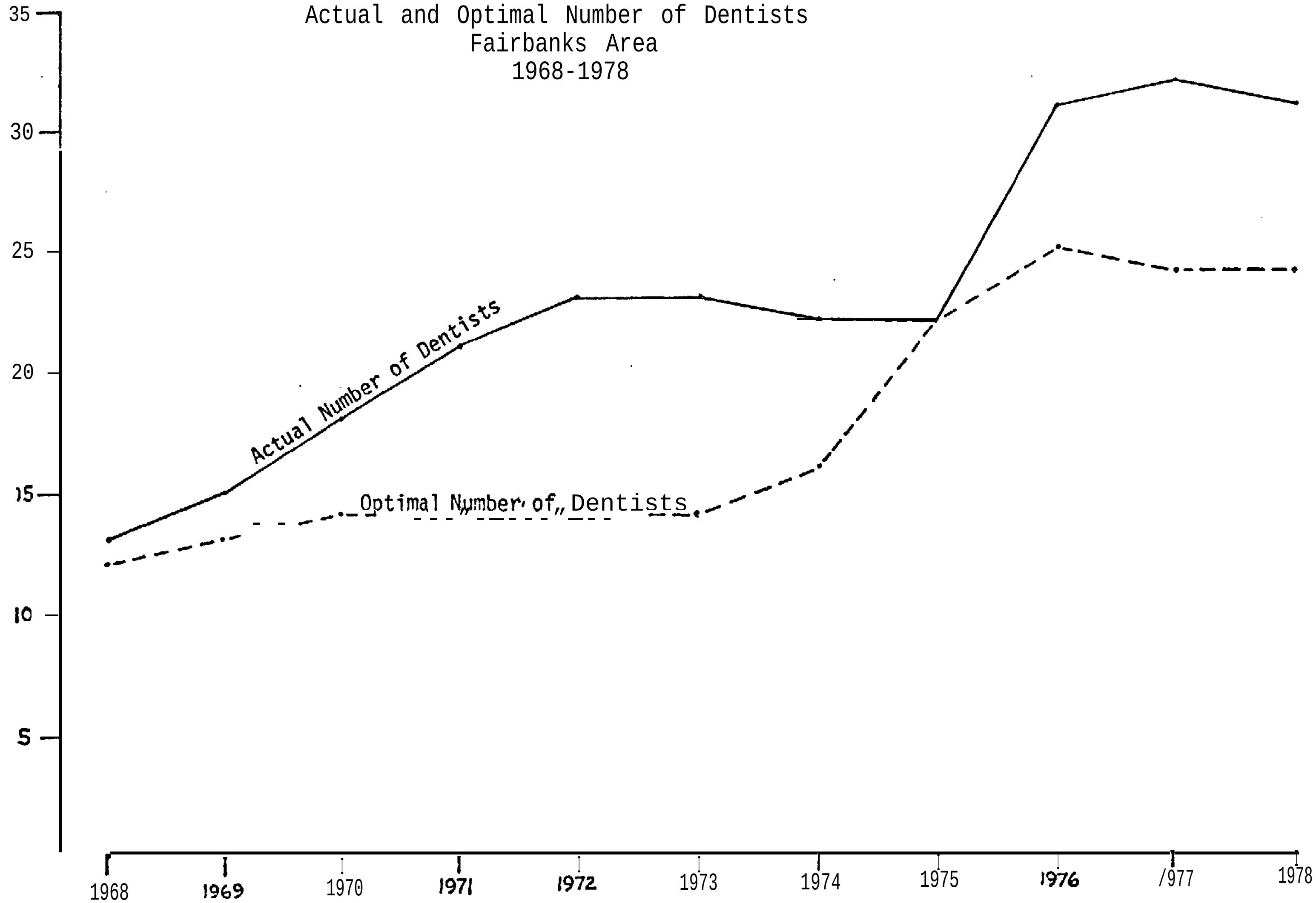


FIGURE 2-8

Actual and Optimal Number
Total M.D.s
Fairbanks Area
1968-1977

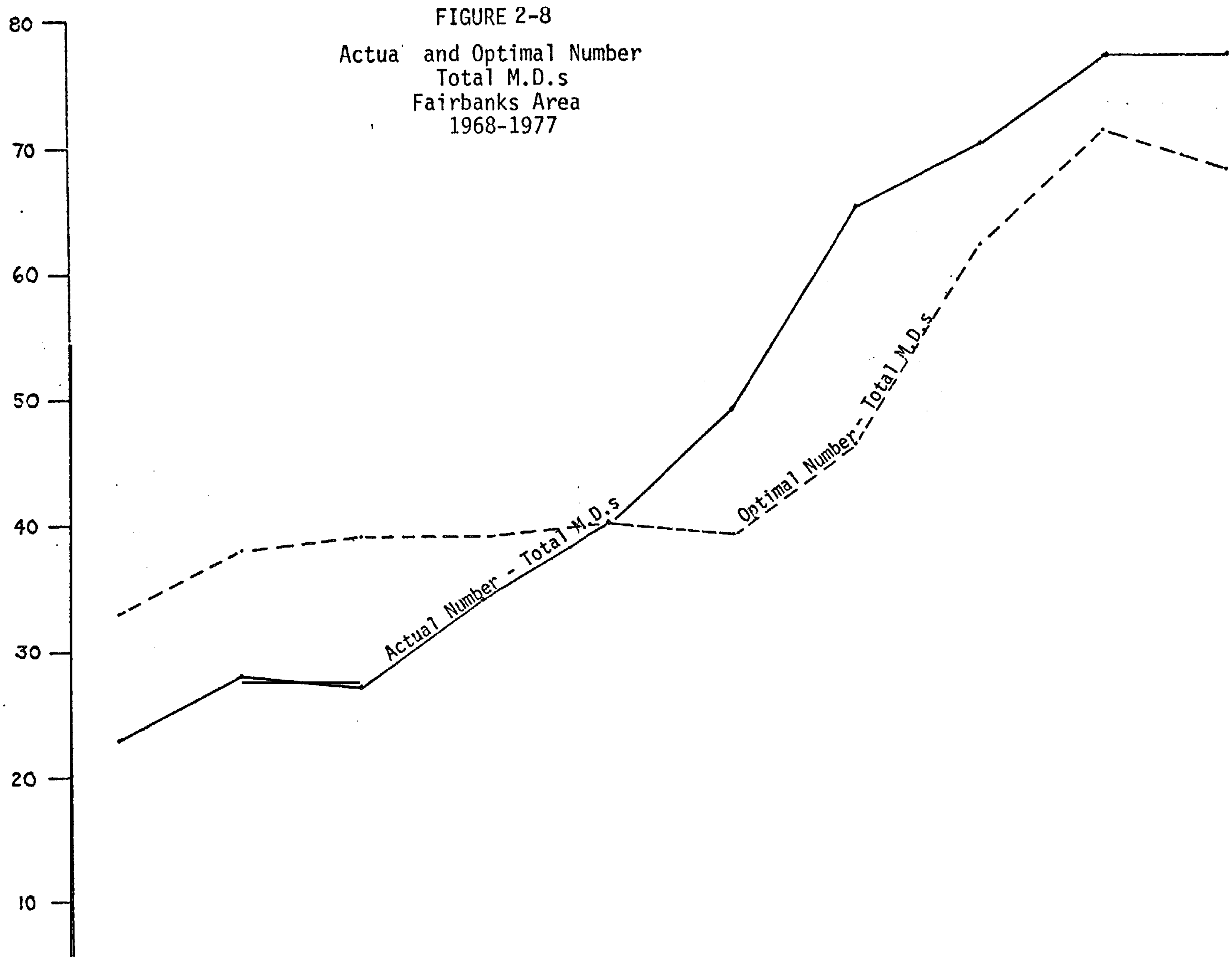
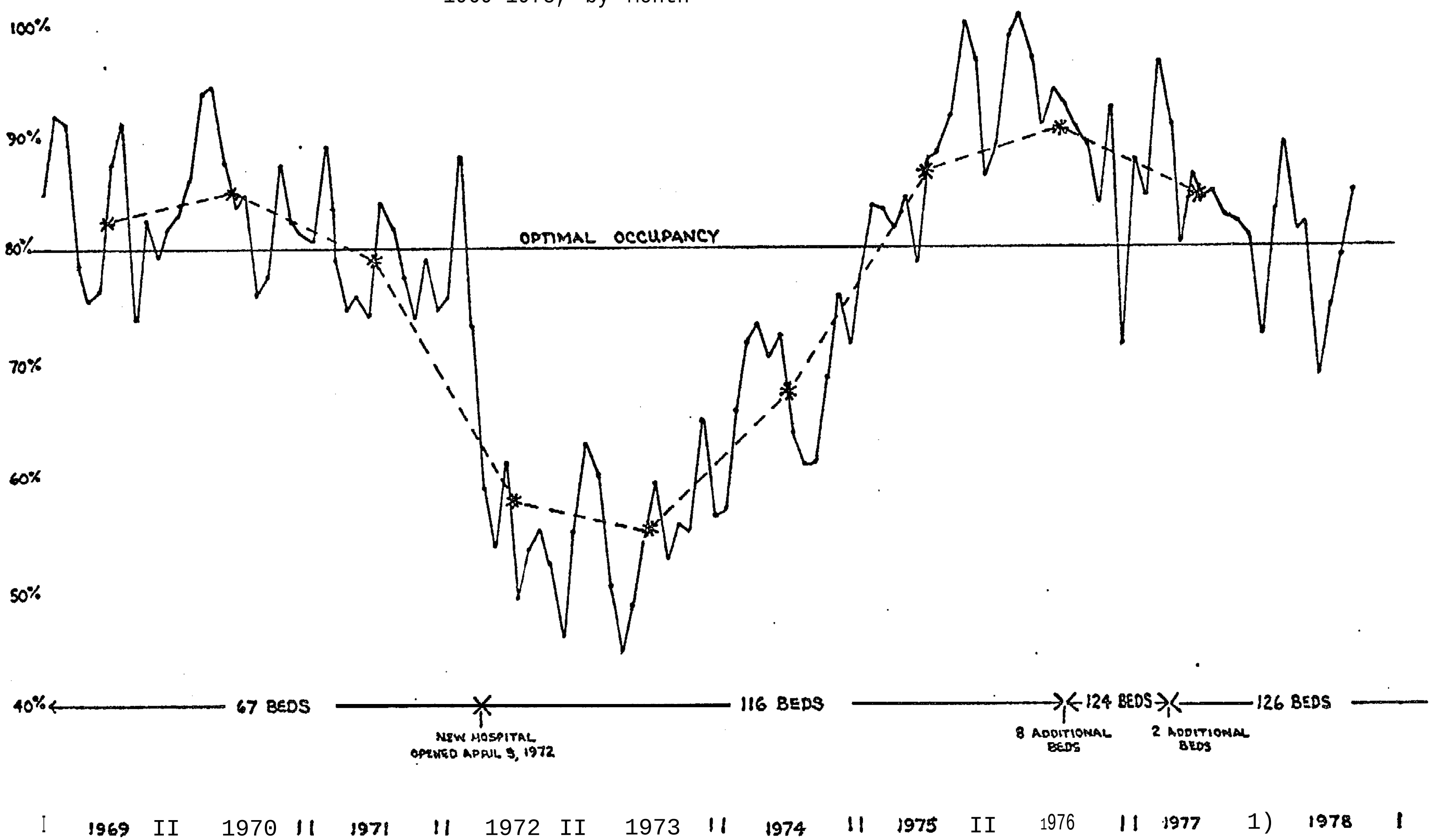


FIGURE 2-9

Optimal and Actual Percent Capacity
Fairbanks Memorial Hospital
1969-1978, by Month



area. In 1975 demand and supply exactly coincided. Demand accelerated in 1975 and 1976 to a peak demand in 1976. Supply, however, increased more than demand, with a peak supply in 1977 of 32 dentists. In this particular service area supply was certainly responsive to demand throughout the period. This can largely be accounted for by the extensive insurance coverage of the population that included generous dental benefits which guaranteed both increased demand for service and high salaries for dental professionals. Despite the satisfactory relationship between supply and demand for dentists, some dissatisfaction did exist in the community regarding waiting time for a dental appointment. It is evident that there was no inhibition of response to demand in any of our four categories: response to increased demand was rapidly achieved, therefore neither uncertainty nor information accuracy and credibility was an important factor. Setting up a professional practice requires only modest financial, physical and human resources. The necessary planning was undertaken by other health-care professionals (mainly physicians) to make professional office space available. Opening a private dental practice is not inhibited by more than minimal procedural requirements, such as obtaining a business license.

Whereas at no time during the pipeline period was there a shortage of dentists, the same cannot be said for doctors. The early part of the period (1968-1972) was a period of shortage (Figure 2-8). This shortage coincides with the incidence of a hospital facilities' shortage in Fairbanks and the two are linked. Medical specialists can only be attracted to an area where the necessary facilities exist to practice their specialty (<u>Resources: Physical and Human</u>). It is no coincidence that the increase in actual number of medical doctors in the Fairbanks area coincides with the period when it was certain that Fairbanks would have new hospital facilities. It is significant to note that in 1968 an election bond issue for construction of a new hospital was defeated (Resources: Financial) but after that defeat a community fund drive succeeded in raising the necessary monies.

By 1972 the doctor shortage had been overcome and for the rest of the pipeline period there were more doctors available than the optimal numbers calculated by applying the national standards to population. Description of the period in the profiles, however, gives the impression that there was no surfeit of doctors. The pipeline experience resulted in greater usage of medical services, both due to increased accidents resulting from increased activity, increased screening services required by Alyeska and increased demand for preventive care generated by the comprehensive medical insurance provided by the pipeline and other employers. The doctor situation can therefore be regarded as inadequate at the outset but satisfactory from 1972 onwards.

Our hospital supply and demand graphs show an inadequate supply of hospital beds during the period from 1968 until 1971 or the opening of the new hospital in April 1972, and then again from 1975 to 1977. The shortage during the early period was recognized as early as 1968 but could not be remedied until financial resources for the construction of a new hospital were generated (Resources: Financial).

With the completion of the new hospital, health planners in Fairbanks felt that the hospital would be adequate to serve the needs of the community until 1978. The 1972 Alyeska impact report[11] predicted a statewide increased need

[11] Mathematical Sciences Northwest Inc., A Study of the Economic & Sociological Impact of Construction & Initial Operation of the Trans-Alaska Pipeline, (MSNW Report 72-410-4, Sept. 1972, Seattle, WA)

for health services but did not predict specific needs for Fairbanks. (Information Accuracy and Credibility). Lacking specific information on the matter, it was anticipated that most accident victims from the pipeline would be evacuated to Anchorage, so hospital administrators did not see a need to plan for pipeline impact in Fairbanks (Information Accuracy and Credibility). In fact, however, during the pipeline construction period accident victims from the pipeline were generally evacuated to Fairbanks. Increased demand for hospital services outstripped increasing supply. One of the problems encountered in providing increased hospital services was in attracting and keeping enough nurses and unskilled hospital personnel. Unlike doctors who were easily attracted by the very high income levels, nurses and unskilled hospital workers were less well paid and could be lured away by higher paying pipeline-related jobs, resulting in high turnover in the hospital workforce (Resources: Human).

The need for hospital expansion in face of the increased demand was recognized by 1976 and plans for expansion were made both by the existing hospital and by the Teamsters for a second hospital. The second hospital did not materialize; consultants argued that a second hospital could not be justified by a community of less than 200,000. A fund drive was initiated for expansion of the existing hospital. As the pipeline project drew to a close the population of Fairbanks decreased and so did hospital bed occupancy rates. The 1978 total figure may well demonstrate an optimal relationship between existing supply and demand.

Development of Operational Measures of Conceptual Categories

The limiting factor analysis confirmed that the conceptual categories which we had identified were indeed the factors that inhibited actual service response to increased demand in Fairbanks during the pipeline period. The next stage in our research was to develop concrete measures of correlates of these conceptual categories. We required a field instrument that could be applied in advance of development to communities that might potentially be chosen as sites for OCS onshore facilities. This meant that the field instrument must be applicable to much smaller communities than Fairbanks, where our conceptual categories had been developed. Other than Anchorage and Fairbanks there are no large cities in Alaska. The size of communities most likely to be affected by OCS onshore development range from a hamlet of 25 people to a town of 5,000. We needed to develop a way of measuring our conceptual category components in such communities. Our goal was to develop a field instrument that could be used to measure prior to development the ability of communities to respond to such changes. Our concern was to develop an instrument that would permit us to differentiate between communities and between particular community services in terms of their potential to respond to rapid development.

Two of the conceptual categories that we had identified - Uncertainty and Information Accuracy and Credibility - cannot generally be regarded as measures for differentiating between communities or between community services. The extent of their influence upon response has been clearly demonstrated in the limiting factor analysis but both categories of factors do not vary greatly among communities or among community services. Uncertainty is generated by lack of clear information about the exogenous forces for change, the nature of the development, its duration and extent. Information Accuracy and Credibility is directly linked to Uncertainty. In the absence of certain and correct information, partial, possibly incorrect information may serve as the basis for planning. Alternatively, correct information that lacks credibility may not be used as the basis of action. Measures can be constructed for both conceptual categories but most are not based on community characteristics. However, the importance of these two factors should not be ignored or neglected.

Most of the measures that could be developed for the Uncertainty and the Information Accuracy and Credibility categories are project related rather than community related. The Uncertainty measures refer to such things as the extent of advance public notice for a development project, advance notice of a definite start-up date and developed project plans containing details of employment, hiring policies, employer benefit policies and materials and purchasing policies for the project. Measures of Information Accuracy and Credibility would include expert assessment of the accuracy of baseline data used for making projections of impact. Expert assessment of the validity of assumptions and methodologies used in such projections would also be needed. Credibility of both official and unofficial projections of development impact would vary by community but would relate largely to project data. Although full development of measures for Uncertainty and Information Accuracy and Credibility would provide a useful tool in impact assessment, it is peripheral to our purpose here since we are trying to develop a means of predicting the differential responses of communities and of particular community services to constant and given development programs. Instead, we need to concentrate on measures of the conceptual-categories that may vary in and between different communities and community services; therefore, we shall be concentrating on measures of Resources and of Procedural Criteria.

Breaking down the Resources and Procedural Criteria categories mainly results in measures that are service specific, such as the human resources necessary to expand the power utility operation, the physical resources necessary to provide a health clinic or the specific procedures that have to be followed to develop a residential sub-division or build a single house. In breaking out all the relevant items we turned again to the supply and demand analysis for each service that we had developed for our initial identification of factors associated with service response to increased demand, as this provided a listing of the relevant human, physical and financial resources required for the development of each service under normal conditions. This, combined with all the information about service development noted in the profiles, was used to develop a complete listing of specific measures by service area. This listing is shown in Figure 2-10. Once the breakdown of specific measures was completed, operational measures for the items were developed.

Experts in each of the service areas were asked if the operational measures that we had formulated were appropriate for the measurement objective[12]. We explained to these experts that our aim was to identify community characteristics that influence the response of services to increased demand. The experts were then given the opportunity to present their views regarding these characteristics. For each service several similar types of characteristics

[12] A list of the people we consulted with is provided in Appendix F.

Matrix I - Correlates of Conceptual Categories by Community and Service

General Community	Housing	Schools	Electric Power	Telephones	Retail Trade	Health
A. UNCERTAINTY Baseline measures of community development and growth over past 10 years: population, workforce, employment, income, building permits, gross receipts	Projections of demand for next five years. Existence of private residential development and market	Projections of number of students for next five years. Facilities plans.	Projections of power demand for next five years. Plans to accommodate demand.	Projections of telephone demand for next five years. Plans to accommodate demand.	Feasibility studies for retail trade expansion.	Health plans covering five year period
B. INFORMATION ACCURACY/CREDIBILITY		Evidence of community willingness to support plans: School board and local assembly/council support for plans. Electoral support.	Community willingness to support plans.	Community willingness to support plans	Evidence of investment funds available to further expansion plans.	Ability to attract public funds to finance planned expansion.
C. RESOURCES Human Population, workforce, employment occupation/skills, lifestyle. Physical Land: public/Private, developed/undeveloped, zoned/unzoned, accessibility of community-transport & communications. Equipment & material:	Human (Realtor) Developers, contractors (bondable), regional housing authority, architect/engineer, laborers, carpenters, electricians, plumbers, machine operators. Physical Current housing stock: number of units, condition, occupancy rates, vacancy rates. Land for residential development. Construe. tion materials, fittings.	Human Teachers, school administrators & planners, school board members, ancillary staff. Physical Existing facilities, capacity/condition, excess capacity, public land for school expansion or new construction. School equipment & supplies Construction capacity for school construction.	Human Engineers, electricians, service crews, operators, administration, management & planning personnel. Construction personnel, bondable contractor, Physical Current equipment & facilities: capacity, space for additional capacity within existing facility. Excess generating equipment, land, construction materials & equipment. Electrical materials & equipment.	Human Telephone engineers, electrician, system operators, service crews, administration, management & planning personnel. Construction personnel, contractor (bondable). Physical Current equipment & facilities: condition & capacity. Excess. capacity, space for expansion in existing facility. Excess switch & distribution equipment, lane construction materials & equipment. telephone equipment & materials.	Human Entrepreneurs, businessmen, managers, sales assistants, bookkeepers/accountant, commercial developers, construction personnel for commercial development. Physical Existing commercial facilities: capacity & condition. Vacancy rate, excess capacity. land available for commercial development, construction materials & equipment, transportation system to serve retail outlet	Human Health professionals doctors, dentists, nurses, health aides etc. Health administrators, managers a planners. Construction personnel. Physical Existing health facilities: condition & capacity, excess capacity, professional office space availability. Medical equipment & supplies, land available for health facility development, construction materials & equipment, access to full range of health services. Transportation & communication.

Matrix I -

General Community	Housing	Schools	Electric Power	Telephones	Retail Trade	Health
C. RESOURCES (continued)						
Financial Average household income. Welfare population, average wage rates, local tax rates, bond rating, public funds, bank, savings & loan, cost of living index. General Community Resources Community ability to attract, keep population. Local contractor. Building materials Construction costs.	Financial Cost of average house/average income. Availability of private financing. Availability of public funds for housing development.	Financial Funding mechanism for school capital improvements-source & availability. Funding mechanism for school operations-source & availability.	Financial Public or private funds available for electrical utility expansion. Revenue bonding capacity, profit or loss on current operations.	Financial Public or private funds available for telephone utility expansion. Revenue bonding capacity. Profit or loss on current operation.	Financial Average rental/construction cost for commercial premises. Availability of private commercial loan fund. Availability of public funds for commercial development.	Financial Public funds available for health facility development. Public funds available for health program development. Average community income. Medical insurance coverage. Hospital development costs. Professional office space costs-rental & construction. "Buy-in" cost to enter existing professional venture.
D. PROCEDURAL CRITERIA						
Type of community government. Within or outside organized borough. Borough powers. Planning process & time schedule. Zoning ordinance in effect. Transportation time to community.	Developers local or from outside. Conditions & time for obtaining development financing. Planning process & time schedule. Number & type of permits required for development. Procurement time for materials. Time & conditions for private mortgage.	School planning process/cycle, time schedule. Time schedule for transmitting plans to school board & local council/assembly. Time schedule for requesting state funds. School development financing process & procedures. Procurement period for school supplies. Planning period for school construction.	Public or private utility. Planning process. Regulation of utility. Processes & time schedule for obtaining expansion financing.	Public or private utility. Planning process. Regulation of utility. Process & time schedule for obtaining expansion financing.	Independent local retail outlets or chain stores. Planning process. Process & time schedule for obtaining commercial loan. Feasibility studies. Permit requirements.	Planning responsibility, process & time schedule. Financing conditions & timetable.

were mentioned by the experts. Whether services would respond to increased demand depended upon:

- The adequacy of the existing system and the extent of excess capacity,
- The availability in the community of people capable of planning for future demand and managing it,
- The availability in the community of the physical resources and construction capacity to erect or extend facilities,
- The availability in the community of reliable people to operate expanded services,
- The availability of local financing,
- The adequacy and frequency of the mode of transportation for goods to the community.

These general factors were touched upon by experts for each of the services but for each service the precise means of measuring these general factors might vary. For example, the human resources required in the field of housing would be a local home builder and a labor workforce, whereas in the schools sector the human resources question was whether teachers could be attracted to the community. Human resources relevant to utilities involve certified electricians in the community and reliable operators who stay in their position once trained. For retail trade the question was the availability in the community of persons willing and able to be store managers or assistants and the availability of a local bookkeeper/accountant to audit the accounts. Finally in the health field the size of the community determined whether one was asking questions about recruiting and retaining doctors or community health aides.

As a result of this interchange with experts in each service field, a system of points or weights was developed according to the views of the experts as to the relative importance of the different community characteristics in determining service response. For example, experts consulted in the field of housing felt that whether the community could respond to increased housing demand would be most influenced by the availability of developable residential land with access to utilities and the availability in the community of private financial resources as represented by the existence of a bank or savings and loan office. A community where no private financial resources for housing development were available would be dependent upon public financing which would require construction by a bonded or bondable contractor; in this case the existence of such a contractor in the community would become an important factor. In the retail trade sector the experts consulted felt that ease of access and transpiration to the community and availability of management personnel would be the key factors in determining whether retail trade responded to increased demand.

In most instances the experts consulted cited the same factors affecting response to increased demand that we had identified through the breakdown of our conceptual variables (Figure 2-10). However, they often suggested more subtle ways of measuring these items than we had developed. Comparison of the breakdown in Figure 2-10 with the measures contained in the field instruments in Chapter 5 illustrates the difference between the factors and the operational measures, but it would be appropriate to highlight a few of the more notable examples here.

Housing

A key factor in determining response to increased housing demand is the availability of land suitable for residential development. It is normal for private land to be used for residential development, but in much of rural Alaska private land is not available which has inhibited the development of a private housing market. For larger public housing projects leasing arrangements for the use of property under the control of local governments and native corporations is also possible, however, this could incur legal costs and time. The existence of private land suitable for residential development is, therefore, certainly a variable among communities.

Our experts also suggested that the availability of private capital in a community would be a vital factor in influencing service response. Land and construction costs are so high in rural Alaska that private housing becomes prohibitively expensive and therefore no private housing market develops. The experts argued that the employers for OCS development will undoubtedly have to become involved in the provision of housing for their workers, either through direct provision of company housing or through a guaranteed "buy back" scheme. Without such arrangements conditions will be too uncertain for the private market to respond adequately to increased demand for houses. If the OCS development employers become directly involved in the provision of housing then local financial resources should not influence the ability of a community to provide more housing. Providing that the OCS development is quite small, however, the presence of local financial resources in the form of a bank or savings and loan association will be an indicator of community ability to respond, and this will vary among communities.

Community responses -to small increases in demand for housing will also be likely to depend on transportation and communication links to major distribution centers such as Anchorage or Seattle.

The size of development would also affect the human and physical resource requirements for housing development. A small development would depend on the local availability of design and construction capacity, building materials, etc., although this does vary for different regions of Alaska, modular units being the norm rather than construction in remote northern and western areas. So for a small housing development whether or not the community had a contractor or home builder, or a dock for off-loading a modular unit would be a significant factor, whereas for a larger development community resources would not influence the response since outside contractors, workforce and materials would most probably be used for the development.

The housing experts suggested that probably the best indicator of community ability to respond to increased housing demand would be evidence of recent private housing development in the community. This would certainly be a variable that would differ among communities.

As a result of our conferences with experts in the housing field in Alaska, we were able to reduce our measurement items to a limited number dealing with availability of suitable land, existence of local financial institutions, transport and communications, availability of local human and physical resources, namely building contractors and workforce and building materials, and evidence of recent private housing development.

School S

In considering the potential responsiveness of community school systems to increased demand, the experts consulted felt that the adequacy of existing facilities and excess capacity would be the most vital determinant features. It is easy enough for a school system to respond to increased demand if it has existing excess capacity. If it does not then the problem faced is of an entirely different magnitude. In general, the experts felt that the scale of OCS development is unlikely to be so great that the school impact could not be dealt with within the existing facilities and system. They felt, however, that new residents arriving in response to OCS development might have educational expectations that were different from those of long-term community residents. To measure potential response to this type of impact, items on special programs, additional funds and new programs and course offerings were introduced. Such items were also regarded as the best means of measuring whether or not the necessary planning and management resources were available for community school system development. The experts pointed out that simply identifying the existence of planning and management personnel within the school district would not permit us to predict the management and planning capacity for the community school system. All schools are mandated to have school boards, and administrations and school superintendents and boards are required to do planning. A more sensitive approach to this matter suggested by the experts was to seek to view documented projections of future student populations as well as a facilities plan. In addition, they suggested that recent capital expenditure on the school system in the community would be indicative of school planning and that a consistent increase in special educational funding for the community's schools would be evidence of programmatic planning and innovation. Simply to look at the general budget would not indicate any planning or development activity as the general budget is funded according to a simple per capita formula that gives no indication whatsoever of the quality of school management or planning.

Another proposed measure of school response capacity had to be revised after consultation with the experts. We had expected that community ability to recruit and retain teachers could be measured by looking at vacancy rates for teaching positions and length of tenure. Length of tenure, however, turned out to be a more limited item than we had suspected. We were looking for long tenure as evidence of the community's ability to retain teachers, but apparently mobility used to be required of rural teachers to insure student exposure to as wide a range of ideas as possible. Although this policy has not been pursued recently, the theory still persists. Teachers used to be permitted only a two-year tenure in any position. Our item, therefore, had to be revised to serve simply as an indicator of whether any communities have particularly speedy turnover of teachers (18 months or less) indicating that teachers experience dissatisfaction in living in the community.

Questions relating to the design and construction of new school facilities are not dealt with at the community level but by the public buildings division of the State of Alaska. All schools' design and construction is handled by the Department of Transportation Division of Facility Planning and Research. For all school construction bondable contractors are required and the work is awarded through public bidding processes. Community construction capacity is therefore largely irrelevant to school construction and expansion programs. Availability of public land for school development is, of course, a consideration, but is not normally a problem. Funding school development is, again, a statewide rather than a community matter and should not operate differently for different communities facing OCS development. Speed of response to demands for expansion is certainly a critical factor. Difficulties of transport and communication in remote areas, combined with limiting construction season constraints means that planning for school expansion where construction is required needs at least two if not three years of lead time, while expansion within existing facilities calls for planning one year or at least six months in advance in order to obtain the necessary supplies in time for the programs. Availability of equipment within schools could not be used as a means of differentiating the propensity of different schools to respond to new demands, according to the experts, because funding for equipment comes from the federal government and most Alaskan schools are overwhelmed with equipment.

Utilities

Where utility expansion was concerned, the experts whom we consulted felt that the nature of the existing system would to a great extent determine the response. If a community has an adequate utility system, serving most tom- . munity residences, with the required excess generating capacity to permit regular maintenance and overhaul of the equipment and without a record of service breakdown or revenue loss, such an utility would also be able to absorb and respond to increased demand. The satisfactory functioning would itself be evidence of planning and management capability. This could be further augmented by measures designed to identify whether management of the utility was locally performed, whether future load projections were available and whether the utility had received public funds for expansion in the recent past.

All of those consulted on the subject of utilities were in agreement that lack of local human resources is probably the most inhibiting factor in utility expansion, development and operation in rural areas. Most power utilities in rural areas consist of one or more generators requiring a facility to house them, a fuel reservoir and the necessary pipe and wire work. A certified electrician is required for the installation work, a plumber for the pipe work and a labor force for construction of the facility. Many rural communities do not have a certified electrician or plumber so these have to be imported. In order to operate the power utility a reliable operator is required for daily checking of the oil flows, pumps, motors, etc. Such operators can be trained at the Seward Skills Center. Operators have, however, in rural Alaska been notoriously unreliable, leaving the utility when seasonal hunting or fishing activities occur and such negligence has often resulted in costly damage to the plant.

Advance planning for utility expansion was considered to be vitally important because of the time required to obtain financing, Where envisaged new equipment exceeded one-half million dollars in value, planning time would need to be up to three years. This partially reflects the fact that transporting utility equipment and materials to Alaska is normally by barge, a slow and irregular but least costly mode. None of the experts consulted felt that obtaining financing for a feasible expansion would be a problem, whether REA or EDA funds were being considered or utility revenue bonds. Where financing was concerned the lead time required would be more of an inhibiting factor than would obtaining the financing.

For telephone service, the existence of a local functioning telephone utility would in itself be an indication of ability to respond to demand. Many small rural communities have no telephone utility and instead rely on the RCA Alascom bush telephone system. Development in rural areas has most often depended on RCA portable earth stations which have been used temporarily. In all other respects, the responsiveness of a telephone utility depends on factors similar to those discussed for a power utility, namely management capability, availability of reliable personnel, and equipment transportation time and cost.

Retail Trade

Whether or not retail trade will be able to respond to increased demand depends at least in part on the feasibility of the existing retail operation(s). Most Alaskan communities have stores although our experts felt that a store could not operate successfully in a community of less that 125 people. Many of the existing rural stores are, however, private enterprises operating at a very low level. Such enterprises cannot be judged using modern retail criteria such as turnover and profit and sales per square foot. Rather many rural stores are simply one room in a residence that carries limited stock, has limited storage space, opens irregular hours, often shutting down during hunting and fishing seasons, serves as a community meeting place, houses the community bush telephone and provides a way of life for the owner-manager that gives him/her an important role in the village and may have little to do with profit, loss and turnover. Such an operation may not generate a large salary but may provide a living. In such primitive retail circumstances ability to respond to increased demand could be measured in terms of existing excess capacity translated into empty shelf space, vacant storage space, and potentially longer opening hours, New community residents associated with OCS development would be unlikely to have the same tastes as existing community residents so there would be a need to expand the range of goods. The difference in expectations, however, might also mean that the new residents would buy all but the basic necessities from outside the community. Transportation to and communications with the community will be a decisive factor in the development of retail trade. The cost of air freighting goods adds considerably to their purchase price; however, bringing bulk goods in by barge requires advance planning, ordering and financing, and storage space. When these costs and the cost of spoilage are taken into account, air freight may not be so much more expensive - but the costs of either mode may make goods purchased in the community prohibitively expensive, damaging the potential for expansion of retail trade. In such small communities the expertise, skills and training necessary for successful retail development are likely to be in chronically short supply. Store owners and managers generally lack the knowledge and training in business operations. Those that have the needed skills are frequently lured away from the village and from retail trade by the offer of richer rewards in government or other private business. To attract suitable candidates for rural retail store management, salary and benefit packages would have to be offered that would be in excess of the venture's profits. Even finding an accountant in the community capable of auditing the enterprise's books may be a problem.

Moving from the small communities to those communities that serve as regional centers, these generally have a retail trade sector consisting of up to 25 ventures. Some of these are branches of larger chains. Finding suitable personnel for retail operations does not pose so great a problem, but even at this level, obtaining financing for retail operations may not be easy. Once again, whether or not there is a bank in the community will provide an indicator of the availability of private capital for commercial investments and it would be possible to discover from the managers of the financial institutions whether commercial loans are being made. Public financial assistance for commercial ventures may be forthcoming from the Small Business Administration, the Economic Development Agency, the Farmers' Home Administration or some cooperative retail venture such as CEDC (Community Enterprise Development Corporation). Evidence that such agencies have made loans to business ventures would indicate the existence of planning and management potential in the community since the agencies require feasibility studies before they make grants.

Health Services

In assessing whether or not health services would respond to increased demand it is necessary first to face the fact that it may well be inappropriate to expect a full range of health services in a small rural community. For example it would be quite inappropriate to have a physician service a population of 125 people if the people in that community had access to a regional center where they could obtain medical care. New community residents associated with OCS development may, however, be used to living in larger communities where a full range of medical services have been available to them. They may require some education in the realities of rural life, in the linkages between different levels of the health system and in appropriate expectations. Measuring the capacity and the adequacy of the existing system can be achieved by comparing the community with the Alaska standards and levels of care in the State Health Plan. Our experts felt that the greatest problem encountered in expanding health services is recruiting health professionals for rural Alaska and keeping them. Problems also exist in finding the personnel for planning and management of health programs and facilities. Our expert advisors suggested that the best means of measuring capacity for development and expansion would be in successful proposals for public funding for health ventures in the recent past. Financing for private health ventures in rural Alaska is apparently not easy to come by because of the lack of economic feasibility for such ventures. In some instances, recognizing that fact, local government units that wish to encourage the development of a private medical care sector will provide incentives for promoting or attracting private medical services. Such incentives may take the form of rent-free office space in the city or council building. A community that has neither an adequate range of appropriate medical services, nor adequate transportation links with another medical service center and which apparently shows little potential for response if demand increased would, quite rightly, be penalized by our scoring system for health items. Perhaps OCS development should be discouraged from locating where adequate services are unlikely to develop.

Summary

The overall result of consulting experts in each of the service areas regarding means of measuring likely service response to increased demand permitted us to refine our instrument to make the items far more specific and sensitive to the realities of service provision in rural Alaska. Frequently the experts were able to suggest alternative means of getting required information where a direct question would not result in useful data.

After consulting with experts for each of the five services, we completed our development of questions for each of the service components for our field instrument. We then identified all those items that were common to two or more services. These we abstracted from the service instruments and consolidated in the general section of the community profile which also had items developed as general measures of community growth and prosperity arising from the breakdown of the relevant community component of the Uncertainty conceptual category. In developing these general community measures we also conferred with experts in the field of community development and growth.

The preliminary field instrument was then tested in Valdez. There we interviewed community leaders and service managers and experts both to discover whether our conceptual categories seemed applicable to the Valdez pipeline-related period, and to see whether the field instrument so far developed seemed to be useable. The validity of our conceptual category analysis was once again confirmed by our discussions with community leaders and experts in Valdez. Some revisions and modifications of our community profile field instrument resulted from our work in Valdez.

After the visit to Valdez the field instruments were further refined preparatory to using them for a demonstration of their use in selected Kenai Peninsula communities. The developed Community Profile field instruments are presented and discussed in Chapter 5.

III. INDIVIDUAL CHANGE ANALYSIS

Chapter II presented both the research methods used to evaluate changes more or less equally shared by community residents and the results of the research. We now turn to an analysis of those changes which tend to be unequally distributed among community residents. Residents prior to impact differ from each other in many ways such as in the number of years of education they have had or in how active they are in subsistence. They experience different changes as a result of outside forces for change. Residents are also likely to assess changes differently, even when they experience basically the same types of changes. Finally, new residents bring a different mix of personal characteristics, experiences and assessments to the community. Their presence changes the characteristics of the community as a whole.

The purpose of the individual change analysis is to show how individuals respond differently so that we can anticipate the effects of outside forces for change in other communities. The energy development experiences of both Fairbanks and Valdez respondents provide the basis for the analysis. A separate analysis is run for each of two communities. This allows us to compare the results of one community analysis with the other. If the results are consistent--if we find out that in both communities certain changes are more likely to be experienced by individuals with the same characteristics--then we can be more confident that the results will help predict changes in other communities.

Analysis Approaches

Two types of analysis are applied in each community. The first type of analysis addresses the changes experienced by existing residents as a result of outside forces for change. To do this, we perform a statistical analysis that makes use of the preimpact characteristics of residents to predict their experiences in the impact situation. Both personal characteristics and experiences were then used to predict the assessments residents made of changes that occurred. The statistical analysis permits us to identify relationships between any two personal characteristics, experiences or assessments by observing the degree the two tend to vary in the same way. In other words, naturally occurring variations in personal characteristics, experiences and assessments are used as a basis to isolate causes of individual changes.[1] Most of Chapter III is devoted to a discussion of the methods and results of the analysis of changes among persons who were living in the community before the development project started.

The second type of analysis shows the changes which result from the addition of new residents during the impact period. This analysis compares the characteristics and experiences of residents who were living in the communities in 1973 with the characteristics and experiences of persons who moved into Fairbanks and Valdez during the impact period of 1973-75. Both types of analysis address the same changes. For each type of change, a presentation of the results of the analysis of changes among existing residents is followed by the results of our comparison of immigrants and

[1]Throughout this chapter, we discuss "causes" of change. However, the use of the term "cause" is not technically correct because we cannot prove that an individual characteristic causes some change. Our analysis can show that two items are strongly related. We make explicit assumptions about which item is the cause and which item is the effect. Since the goal of the analysis does concern causality, however, it is the term that makes the discussion of analytical objectives easiest to understand.

residents. A complete tabulation of the differences between residents and immigrants is presented in Appendix G.

Data Base

Before discussing our methods and results, the data base for the analysis should be described. Mostof the data required for our analysis is not routinely available. In fact, of all Alaskan communities, we could only perform the analysis in Fairbanks and Valdez at the time the Predictive Indicator Study was initiated. The measurement of all variables of individual change used information obtained from previously performed surveys in Fairbanks and Valdez. The Fairbanks data was obtained from a randomly selected and surveyed sample of 415 adult residents of the North Star Borough. (the political jurisdiction encompassing the Fairbanks area). A survey was conducted one year later for the purpose of assessing emigration behavior. Both surveys were conducted by the Institute of Social and Economic Research of the University of Alaska. In Valdez, a similar survey was conducted in early 1974, several months prior to the start of pipeline construction. Another survey was conducted in September 1975. Both Valdez surveys were conducted by the Department of Sociology at the University of Alaska, Anchorage. The 1974 Valdez survey interviewed 286 household heads of the 350 local families enumerated in a community census conducted in December 1973. The 1975 survey of Valdez interviewed a random sample of 101 families drawn from the 286 originally interviewed in 1974.[2] An additional random sample of 122 family heads who had moved into the

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[2]One hundred thirty-seven families were originally selected for re-interviewing in Valdez under the time series design; sample loss occurred primarily from those who had moved away from Valdez during the 18 month time period between surveys.

community during the impact period of 1974 and 1975 were also interviewed. The Valdez data consequently consists of interviews with 409 different respondents, of which 185 were interviewed only prior to the start of construction, 101 both before and during the impact, and 123 only during the impact period. Samples in both Fairbanks and Valdez specifically excluded workers housed in construction camp sites.

Finally, baseline surveys conducted on the Kenai Peninsula constitute the data base for our illustration of how the results of our analysis can be applied. The Kenai Peninsula pre-OCS impact surveys were performed independently of the Fairbanks and Valdez surveys. The same questionnaire was used in the cities of Kenai, Soldotna, Seward and Seldovia in a survey conducted by the Urban Observatory of the University of Alaska, Anchorage, in the summer, 1976. Different questionnaires designed to fit local needs were used in Homer, Port Graham and English Bay in a series of surveys conducted by the Department of Sociology throughout the spring, summer and fall of 1975. In all cases data was obtained from random samples of household heads using personal interviews.

The Fairbanks and Valdez data sets are not exactly the same. Both of these surveys were designed independently with somewhat different purposes. The surveys covered many of the same topics but used different questions. In addition, concepts developed for the Predictive Indicator Study were not those originally proposed for study in either the Fairbanks or Valdez surveys. Considerable research effort was directed, therefore, toward the development of comparable measures. In most cases, these research problems were successfully resolved. However, in come cases interpretations had to be made on the basis of information available in only one of the communities.

Conceptual Organization of Items in Analysis

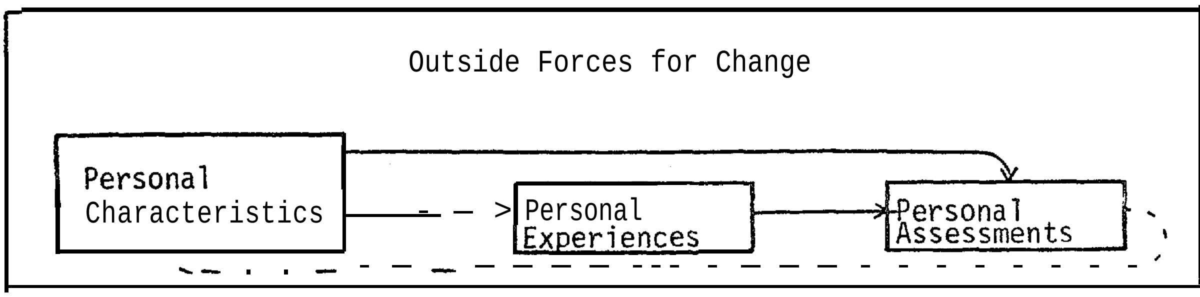
As we mentioned earlier, the analysis of individual level changes takes two forms. The first analysis is of the changes experienced by residents who were living in the community before the development project started. The analysis thus focuses on the resident population alone. For this group, the items included in the statistical analysis are classified into three broad categories:

- The personal characteristics of residents prior to the situation of impact in the community.
- The personal experiences of residents during the impact situation.
- The personal assessments by residents of those short-term changes resulting from the impact situation.

The purpose of these categories is to establish the order in which changes occur so that we can identify causes and effects. In general, personal assessments are assumed to result primarily from personal experiences. However, personal assessments may be influenced by personal characteristics as well. Personal experiences, in turn, are assumed to vary as a result of differing personal characteristics (see Figure 3-l). Outside forces for change are not explicitly included as items in this phase of the analysis as they do not vary across individuals. Rather, the effects of the same outside forces differ among individuals because the individuals differ from each other.

FIGURE 3-1

ORDERING OF ANALYSIS CATEGORIES



The ordering of these categories is circular in the sense that personal assessments may change personal characteristics which then change experiences and so on. A study of long term effects of the impact process would have to consider the loop back to the beginning of the sequence. Our analysis, however, is confined to a study of short term changes. The experiences and assessments include only those observed during the pipeline construction] period.

Both the personal characteristics expected to influence individual social, economic and environmental changes and the observable changes themselves are included as items in one of the three categories: personal characteristics, experiences and assessments.

Potentially Important Areas of Change

Thirteen potentially important economic and social changes were identified. The analysis attempts to explain why individual residents differed in these thirteen areas of change. The thirteen areas of change are:

- change in job to work on the energy development project
- change in job conditions as an indirect effect of the energy development project
- change in time spent working
- change in income
- change in consumption of housing, major appliances, cars and other costly items
- change in time spent with family
- change in time spent recreating
- change in time spent visiting
- change in time spent hunting and fishing
- change in how good the community is seen as a place to live
- change in personal satisfaction
- change in attitudes toward growth and development
- plans to move from the community

Each of the thirteen areas of change is associated with one of the three categories mentioned earlier. The first nine and the last are personal experiences while the remaining three are personal assessments. With the exception of moving plans, all of the personal experiences and assessments fit within the causal sequence diagramed in Figure 3-1.

The expected relationships among the thirteen areas of change are shown in Figure 3-la, along with the expected relationships with the major personal characteristics included in the analysis. Each line indicates a hypothesized relationship. As the reader can readily see, a large number of relationships are tested in the analysis. However, the relationships are tested in a stepwise fashion, proceeding from the first individual change (work directly on project) to the last (plans to move from the community). We will also discuss the analysis results in a stepwise fashion. A series of diagrams similar to Figure 3-la will display the analysis results under discussion while at the same time displaying a cumulative summary of the analysis results previously introduced. In this way, the reader can focus on a manageable subset of our analysis results while keeping the analysis as a whole in perspective.

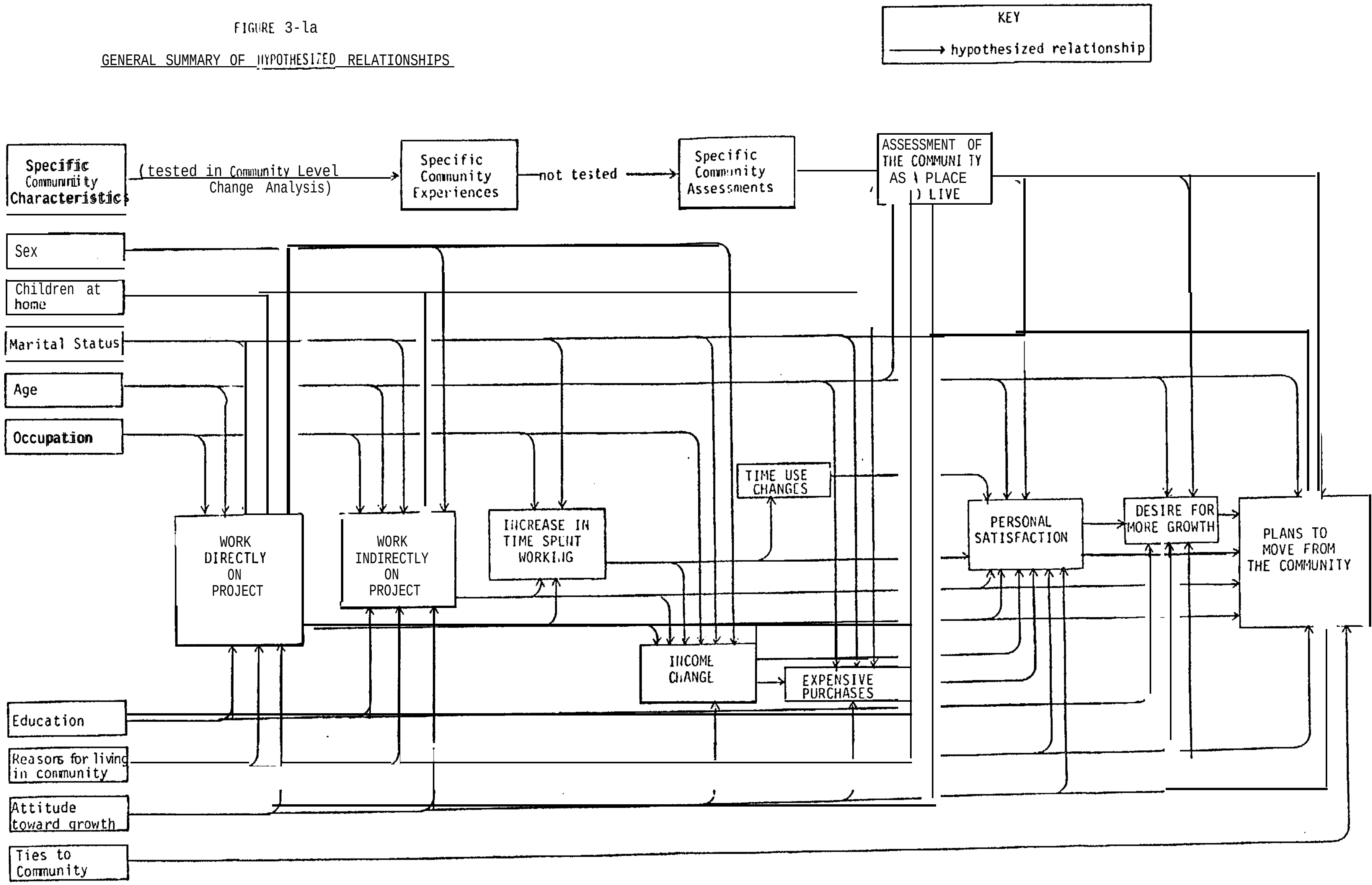
Analysis Technique

The same analysis technique was used for each of the thirteen areas of change. For readers who are familiar with statistical techniques, a path analysis using a modified form of dummy variable multiple regression was performed. A technical discussion of analysis method is included in Appendix E. For those who are unfamiliar with this type of analysis, however, a brief description of what the analysis technique is designed to accomplish is presented here.

Each area of change in our analysis is treated as a dependent variable. An area of change is "dependent" in the sense that it results from something else. It is a variable because the amount of change varies among individuals. For example, some persons experience greater income increases

FIGURE 3-1a

GENERAL SUMMARY OF HYPOTHESIZED RELATIONSHIPS



than others. Different degrees of change are associated with different numbers. Each person interviewed is assigned a number for each dependent variable. A dependent variable may have only two numbers, as in the case of whether a person did or did not work on the development project. When a dependent variable has more than two numbers, the values are arranged in order from small to large or along some other single dimension.

The items that may cause changes in the dependent variables are referred to as i'ndependent variables. All personal characteristics in the analysis are potential causes of change so they are all independent variables. Many personal experiences and personal assessments also are independent variables. The analysis is designed to predict each person's actual response on the dependent variable on the basis of all relevant independent variables. The independent variables differ in each analysis but are drawn from the entire set of personal characteristics, experiences and assessments. As with the dependent variables, the numerical values of the independent variables are ordered.

In its simplest form, this technique is used with one independent and one dependent variable. An independent variable is a good predictor of the dependent variable if responses on the two tend to vary in the same way. That is, if individuals who score high on the independent variable tend to also score high on the dependent variable, then the independent variable is a good predictor.[3] We are testing the degree that an independent and dependent variable vary in the same way across all individuals in the sample.

'Actually, it would also be a good predictor if a high score on one is associated with a low score on the other and vice versa.

The analysis is somewhat complicated because more than one independent variable is involved in each analysis and that the independent variables are related to each other. Suppose, for example, that there are two independent variables. Suppose also that they both vary in the same way so that they in part predict each other. In this case, we cannot simply test the degree of shared variation of each independent variable with the dependent variable separately and assume that our total success in prediction is the sum of the two. This is because the predictive power of one independent variable is partly explained by the other independent variable. For example, the predictive power of occupation may be partly explained by education. The solution to this problem is to statistically hold the effects of all but one independent variable constant. The predictive power of a single independent variable can then be measured.

Another complication is that some personal characteristics are not made up of numbers that are ordered. Occupation, for example, is composed of discrete job classifications. These classifications cannot be placed along a single dimension. One type of job is not “more” or “less” than another job type, just different. Our independent variables, however, must have ordered values so that we can observe whether responses vary in the same way. The problem can be solved by treating each number of the personal characteristic as a separate independent variable. In this way, each newly created variable will be ordered because it consists of only two categories: yes or no.

The final complication is that the thirteen areas of change are related to each other. One type of change may be a cause of another type of change. For example, employment on the energy development project may tend to increase household incomes. As a result, the analyses of the areas of change are not independent. The method of analysis must permit us to show the links between all independent and dependent variables. This requirement does not actually change the type of analysis but will affect the way the results are reported. The relationship between areas of change will become clear as we proceed to discuss the analysis results.

Objectives of the Analysis

The first objective of each analysis is to see how successfully we can predict how individuals differ in the changes they experience. The measure of overall predictive success provided by the statistical analysis is expressed as the percent of the variation of individual responses on the dependent variable that are explained by all of the independent variables. This measure is hereafter referred to as R-squared (R^2). R* values can vary from zero to one. An R^2 of zero means that the independent variables are of no use in explaining variations on the dependent variable. For example, if knowing a person's occupation, age and sex does not help us to decide whether he or she took a job on the energy development, then the R^2 would be zero. If we could decide perfectly on the basis of the same information, the R^2 would be 1.0. R^2 values in the range of .20 to .30 are reasonably good for this type of social research. Of course, higher values are better but not common. Separate R^2 values are calculated for Fairbanks and Valdez.

The second objective is to decide whether a single independent variable improves out ability to predict beyond what we can do with all the other independent variables. To meet this objective, the individual effects of each independent variable are statistically calculated and compared to the effect we might expect to see by chance. If the effect is large enough to be an unlikely chance occurrence, the second objective is satisfied. Again, this procedure is applied for both Fairbanks and Valdez.

Our final objective in each analysis is to see whether each independent variable is related to the dependent variable in the same way in both Fairbanks and Valdez. A college education may make it less likely that a person works on the energy project in Fairbanks. We need to know if the same relationship holds in Valdez. If the relationships are consistent, we may have succeeded in identifying a general relationship that will hold in communities experiencing an OCS development. This is the primary goal of the Individual Change Analysis.. If a college education makes it more rather than less likely that a person works on the project in Valdez, the results in the two communities would be inconsistent. Should the results be inconsistent, it is important to understand why. Otherwise, it will not be possible to generalize to other communities.

The next section of this chapter introduces the reader to the procedures and format used to present the detailed results of the Individual Level Change component of the Predictive Indicator Study. The section is followed by over one hundred pages of text and tables that should provide the reader with an in-depth understanding of the results of our research. However, we recognize that some readers may not wish to spend the time necessary to read the entire discussion. We recommend that these readers skip to page 111-125 where a ten page summary of the results is provided.

Interpretation of Printed Analysis Results

The same analysis technique and objectives are applied to the thirteen areas of change outlined in the beginning of this chapter. The results of each analysis are presented in the same way as well (see Table 3-l). The independent variables entered in the analysis appear on the left side of the table. The results applying to Fairbanks and Valdez appear under the name of the community. The R^2 values which pertain to the first analysis objective (overall predictive success) appear at the bottom of the table. Information relevant to the second objective (significance of each independent variable) and the third objective (direction of relationship between independent and dependent variable) is contained in the body of the table.

A positive sign alone in Table 3-1 means that a variable significantly improves the prediction and that it is positively related to the dependent variable. For example, a married head of household is significantly more likely to have worked on the energy project than a nonmarried head when the effects of all other independent variables are statistically held constant. A negative sign means that a significant negative relationship is observed.

The interpretation of the other symbols requires a more detailed explanation. The analysis method used to produce the analysis results has a general characteristic that the reader should understand. Seldom more than five variables significantly improve a single prediction.[4] This is

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[4]Jum Nunally, Psychometric Theory (New York: McGraw Hill, 1967), p. 162.

TABLE 3-1

EXAMPLE OF HOW ANALYSIS RESULTS ARE PRESENTED FOR EACH POTENTIAL AREA OF CHANGE

Independent Variables (Personal characteristic, experience or assessment)	Fairbanks	Valdez	Assignment of Results
Married	+	+	C
Male			C
Desire more income	+	+0	C
Under 25	+	0	I
25 to 34	+	-0	I
35 to 44		+0	I
High school education		-0	C
College education	+0	+0	N
R^2	.34	.25	

Key:

Symbol	Meaning	Consistent Relationships	Inconsistent Relationships	Assignment of Results
+	significant positive	+ and +	+ and -	C=Consistent
+0	non-significant positive	+ and +0	+ and -0	I=Inconsistent
0	no relationship	- and -0	+ and 0	N=No relationship
-0	non-significant negative	- and -	- and 0	
-	significant negative		- and +0	
R^2	percent of variation explained by all independent variables			

because the independent variables are somewhat redundant; that is, they vary in the same way to some extent. We have entered many more than five independent variables in our analysis because we want to compare a wide range of possible causes of different individual experiences. Since this type of analysis usually only identifies a few significant variables, obviously not all of the independent variables we have entered in the analysis will show a significant effect. Slight differences between the communities can easily result in different independent variables being identified as significant. If we only compare the direction of significant variables, we are likely to find that few, if any, comparisons can be made.[5] To minimize this problem, the direction of the relationship of any variable which is not significant but which shows some effect is also shown on Table 3-1.[6] A negative-zero (-0) symbol indicates a nonsignificant negative relationship and a positive-zero (+0) symbol indicates a nonsignificant positive relationship. A zero alone indicates that the relationship is too weak to justify assigning a positive or negative direction.

While the above discussion may appear confusing, it will ultimately make the interpretation of all our analysis results easier to understand. The reader need only to remember the meaning of the following symbols:

Table 3-2

MEANING OF SYMBOLS USED TO REPORT RESULTS

Symbol	Meaning
+	A significant positive relationship
+0	A non-significant but probably positive relationship
0	A weak or negligible relationship
-0	A non-significant but probably negative relationship
	A significant negative relationship

[5] On strict scientific grounds, we should ignore all nonsignificant relationships. To do so, however, would prevent us from discussing many relationships which would be significant if we had a larger sample of individuals in each community. We believe that the cost of ignoring potentially significant relationships is greater in this case than the cost of considering a relationship which may be totally due to chance. The level of knowledge of how individual experiences differ in major energy developments is so limited that we believe the risk of misinterpretation is relatively unimportant compared to the potential understanding that may be gained from a liberal interpretation of the results.

[6] Variables which had an observed regression coefficient of .10 or greater but which included 0 in an 80 percent confidence interval were included in this category. Theoretically, the true direction may not be the same as the observed direction if the relationship is not significant. However, the inclusion only of variables which have a regression coefficient of .10 or greater reduces the likelihood that the observed direction is wrong.

For the purposes of the analysis, relationships which are consistent in Fairbanks and Valdez are ones which both have the same direction as long as at least one is identified as being significant. In terms of our symbols, the following are considered consistent relationships:

Table 3-3
CONSISTENT RELATIONSHIPS

+	and	+
+	and	+0
-	and	-0
-	and	-

As with any true experiment, we are also faced with a healthy share of inconsistent results. We may gain as much by searching for answers to inconsistent results as we will by identifying consistent results. It is important, then, to try to identify the reasons why the inconsistencies have occurred. Besides random error, the potential reasons include:

- One of the relationships may be based on a poor measure. The observed relationship may not be valid.

- The relationship of an independent and dependent variable may be affected by a third, unmeasured characteristic. If the unmeasured characteristic is different in the two case study communities, then the observed relationship may appear to be inconsistent.

- Differences in the outside forces for change in the case study communities may result in different relationships. The results based on one type of development may not be the same as the results based on another.

The first two reasons can be addressed using the same research approach. They are problems that can be solved by either changing or adding measures. Where possible, we will suggest appropriate changes and additions. The third reason is more critical. We are using Fairbanks and Valdez as case study communities on the assumption that the relationships we identify will hold in communities experiencing OCS developments. If the outside forces in Fairbanks and Valdez have different relationships with the same individual characteristics, we cannot make that assumption. The research approach still is useful, however, if we can explain why somewhat different outside forces for change are not related in the same way to some individual characteristics. Predictions can then be adjusted to fit the particular combination of outside forces.

The inconsistent relationships in our analysis can be defined in terms of the same set of symbols introduced earlier for the consistent results. Both definitions are shown below:

Table 3-4

CONSISTENT AND INCONSISTENT RELATIONSHIPS

Consistent Relationships	Inconsistent Relationships
+ and +	+ and -
+ and +0	+ and -0
and -0	+ and 0
- and -	- and 0
	- and +0

Of course, the order in which any of the above combinations can occur does notaffect the interpretation of the result. The difference between the combinations (+ and +0) and (+0 and +) is merely the community in which each result was observed, Fairbanks being listed first and Valdez second (see Table 3-1).

Now we are ready to discuss each of the thirteen areas of change, our dependent variables, in detail.

Change in Job to Work on the Energy Development Project

CHANGES AMONG EXISTING RESIDENTS

The driving force behind many individual changes is that of employment opportunities created directly and indirectly by the energy development during its construction phase. This period is relatively labor intensive and a wide range of employment opportunities are created. The dependent variable in the analysis indicates whether an individual was directly employed or was seeking employment in the energy development. Both the Valdez and Fairbanks surveys contain this information.

The analyses of direct employment is based on the experiences of the heads of households only and not the entire adult population.[7] While other adults experienced changes in employment, the employment experience of the head of the household tends to result in other changes that are experienced by all members of the household. The activities of the head of the household are often more important causes of change for a person who is not the head than his or her own experiences.

‘For the purposes of this study, heads of household are defined as the husband in the case of a married couple and the person who was identified as the head by the household members in other cases. .

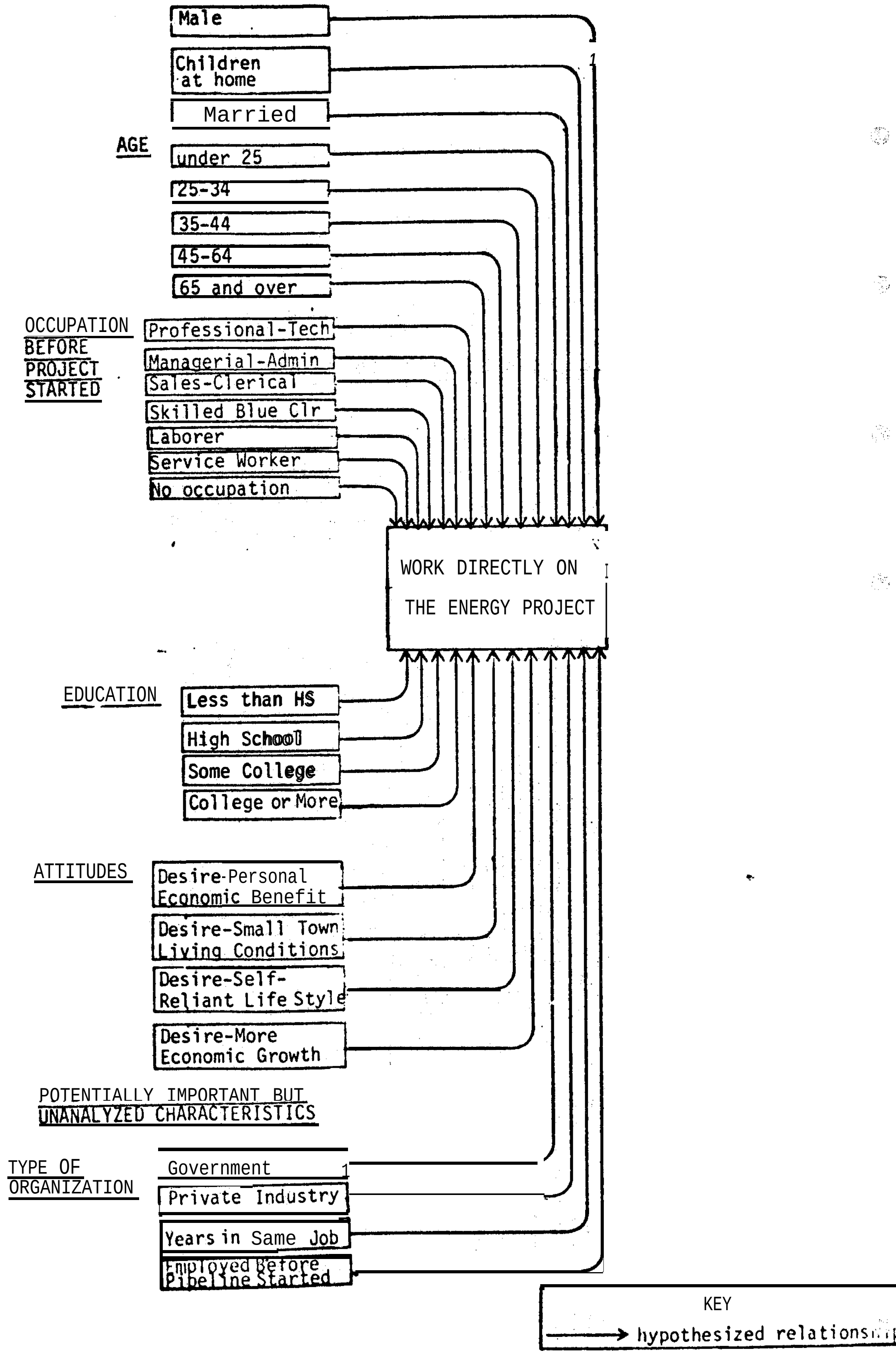
The direct employment experience was hypothesized to be dependent on numerous individual characteristics. These individual characteristics include:

- sex
- marital status
- presence of children in the household
- age
- occupation prior to the development
- employment status prior to the development
- education
- desire for personal economic benefits
- desire for small town living environment
- desire to lead a self-reliant life style
- desire for more community growth

The independent variables in the analysis are constructed from the set of personal characteristics hypothesized to influence the employment experience. Remember that a personal characteristic such as occupation enters the analysis as a series of independent variables. Each variable corresponds to one type of occupation. Figure 3-2 shows the independent variables thought to affect the direct employment experience.

FIGURE 3-2

ANALYSIS OF DIRECT EMPLOYMENT ON THE ENERGY PROJECT: HYPOTHESIZED RELATIONSHIPS



The analyses of differences in employment experiences on the energy development projects in Fairbanks and Valdez show moderately successful overall predictions with R* values of .23 and .31, respectively (see Table 3-5). Turning now to a comparison of the effects of the independent variables, we find a mixture of consistent and inconsistent results (see Table 3-5). The consistent results indicate that a head of household is more likely to work directly on the energy development if he or she:

- is married
- is without children under 18
- is under 25
- was a laborer before the development started
- did not complete college

The remaining variables showed either inconsistent or only weakly consistent relationships. Returning to the consistent results, it appears that jobs created by an energy project are most likely to be taken by young married people without children who are not highly specialized in terms of formal training and who have had experience as an unskilled blue collar worker. Of course, this profile is a simple combination of all the factors found to be consistent. Many combinations of personal characteristics can be visualized but this particular combination is a useful summary of the results. The question is, why these particular factors? The importance of marriage as an incentive to work is not an unusual finding in Alaska, or elsewhere. When combined with the finding that persons under 25 are the most likely age group to participate in new employment opportunities,

TABLE 3-5

RESULTS OF ANALYSIS OF WORK EXPERIENCES ON THE ENERGY PROJECT

Characteristics of Head of Household	Community: Fairbanks	Community: Valdez	Assignment of Results
Married	+	+0	C
Has children under 18		-0	C
Male	+0	+0	N
Age: under 25 years	+	+0	C
25-34	+0	-0	N
35-44	-0	+0	N
45-64	-0	0	I
65 and over	.	0	I
Predevelopment occupation			
Professional-technical	0.	+	I
Manager-administrator	+0	+0	N
Sates-clerical	+0	-0	N
Skilled blue collar	-0	+0	N
Laborer	+0	+	C
Service	0		I
No occupation	0	+0	N
Education			
Less than high school	-0	+0	N
High School	"0	+0 "	N
Some college	+	0	I
College or more	-0	-	C
Desires more personal economic benefits	+	0	N
Desires small town living conditions	-	+0	I
Desires Alaskan life style	0	+	N
Desires more community growth	0	+	N
R^2	.23	.31	

Key:

Symbol	Meaning
+	significant positive
+0	non-significant positive
0	no relationship
-0	non-significant negative
-	significant negative
R^2	percent of variation explained by all independent variables

Consistent Relationships	Inconsistent Relationships	Assignment of Results
+ and +	+ and -	C=Consistent
+ and +0	+ and -0	I= Inconsistent
- and -0	+ and 0	N=No relationship
- and -	- and 0	
	- and +0	

a ready explanation can be offered; young married couples may be particularly aware of new financial responsibilities and the husband may be attracted to a high paying job.

The counteracting effect of having children also may involve new responsibilities, but responsibilities which conflict with jobs that involve working very long hours or away from home.

Experience as a laborer has an obvious connection to employment on the construction phase of the energy project. What is interesting is that skilled blue collar experience shows only a weak positive relationship in Valdez and, surprisingly, a weak negative relationship in Fairbanks. This raises a key issue; perhaps the employment demands of major energy developments are so specialized that the blue collar skills relevant to community demands are not generally appropriate. . We will return to this issue in the analysis of indirect employment changes.

Another result that contradicts our expectations is that persons employed in professional-technical[8] occupations in Valdez before the development are significantly more likely to work on the energy project than not when the effects of all other variables are held constant (see Table 3-5). The Fairbanks results show no relationship. One would expect that persons with highly specialized occupations would not commonly find a suitable job directly with the project. In fact, only one of thirty household heads in Valdez who had been employed in a professional-technical occupation before the development worked directly on the project. The significant

[8]The professional-technical category includes accountants, engineers, lawyers, scientists, physicians, nurses, teachers, artists among other highly skilled occupations.

positive relationship appears to be an unexplainable anomolous result that is not worth further scrutiny.

The final inconsistency involving an occupation variable is that Valdez residents employed in service occupations before the project began are significantly less likely to work directly on the project while residents who worked in service occupations in Fairbanks show no relationship with direct employment. The differing results may be explained by omission of a key variable, the type of employer. Neither survey determined the type of employer the head of the household worked for before construction activities began. Most Valdez residents working in a service occupation before the development began were employed by the state hospital located in Valdez. Hospital jobs had many long term benefits which would be sacrificed by leaving the job to work on the development project. Thus, in Valdez, the service occupation variable was also associated with a type of employment that would be difficult to leave. The specific employer-occupation relationship in Valdez may explain why service workers there were not likely to work directly on the energy project.

Many Fairbanks residents working in service occupations in 1973 also worked for employers who offered long term benefits. But a substantial number worked for employers who did not offer long term benefits. These employers included many private service businesses such as restaurants, cleaning firms, airlines, barbers, and security agencies. Fairbanks is large enough to support a wide mix of private and public services. Many of these services were performed by the developer directly. As a result,

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[9]Service occupations include janitors, waiters, dental assistants, hospital orderlies, stewardesses, barbers, firemen, security guards among others.

it is not surprising that the service occupation variable is not negatively related to project employment as it is Valdez. The occupation-employer relationship fits the second reason why inconsistencies can occur.[10] The inconsistency may be resolved by taking the employer as well as the occupation into account.

Turning now to the education variables, the results shown in Table 3-5 indicate that residents who have completed a college degree are relatively unlikely to work directly on an energy project. This result suggests that career investment and specialization may be a deterrant to direct employment despite the contradictory results for the professional-technical occupations. Results for the remaining education variables are divergent in Fairbanks and Valdez. Tied with the finding that persons under 25 are most likely to work on the project, it appears that college students may form an important labor pool in Fairbanks. In Valdez, residents completing high school appear to be relatively more likely to participate.

The difference between the two communities may be explained by the presence of the University in Fairbanks. It may also reflect a somewhat different mix of employment opportunities. Although Fairbanks did not serve as the administrative headquarters for the energy project, a substantial number of administrative and clerical positions were located in the community. Except for the administrative personnel brought into Valdez, the vast majority of employment opportunities were in the blue collar occupations. The relatively greater demand for white collar workers in Fairbanks may account for the importance of having some college education.

[10]That is, the relationship of an independent and dependent variable may be affected by a third, unmeasured characteristic.

It is important to note that in both communities residents not completing high school were not a prime source of workers on the energy project. Up to a point, education appears to increase employment options rather than decrease them.

While none of the four personal attitudes entered in the analysis showed a significant relationship in both Fairbanks and Valdez, all four were significant in one of the communities (see Table 3-5). The desire for personal economic benefits showed a significant relationship in the expected direction (positive) in Fairbanks and a weak positive relationship in Valdez. A positive attitude toward community growth also showed a significant positive relationship, this time in Valdez but not Fairbanks. Attitudes toward community growth and personal economic benefits were closely related in both communities. Whichever of the two variables proved to be the better predictor in each community "captured" most of the predictive power, leaving the other variable little additional that it could explain. The attitude toward personal economic benefits proved to be a marginally better predictor in Fairbanks while the attitude toward community growth performed slightly better in Valdez. Either variable would work almost as well in both communities. However, since the variables together give a somewhat better prediction than either variable alone, it seems advisable to retain both in future research.

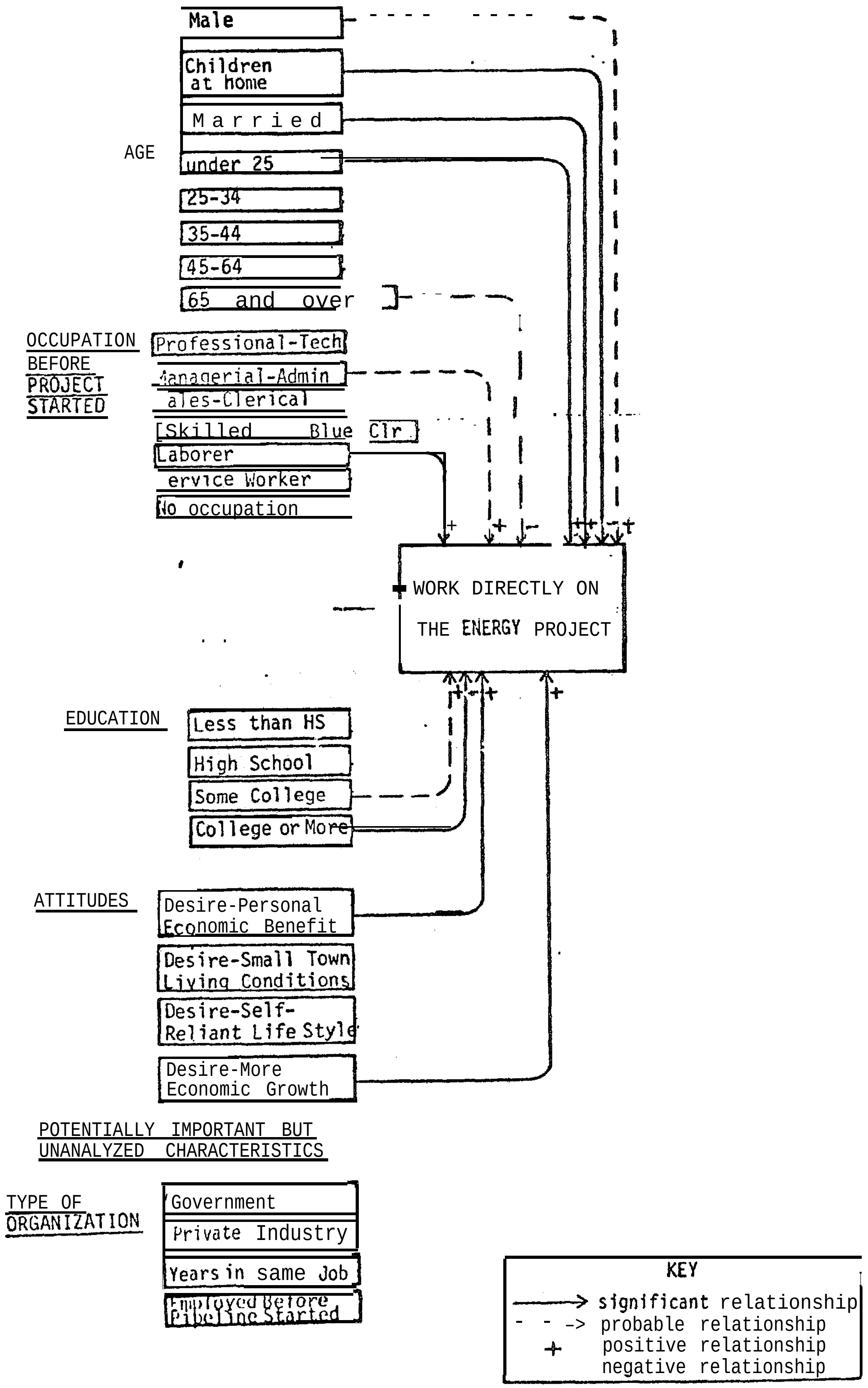
The attitude toward small town living showed the expected relationship to working directly on the energy project only in the case of Fairbanks. In that community, persons who had a strong desire to live in a small community were relatively less likely to work on the project. In Valdez, however, a weak but opposite relationship appeared. There is no ready explanation for the Valdez result, although we suspect that the measure used in Valdez may not adequately reflect the attitude toward small town living of the head of the household because it pertains to the respondent who is not in all cases the head of the household.

Finally, the results show that a desire for a life style which stresses self-reliance and being close to nature does not deter residents from working in a high paying job on the energy project (see Table 3-5). On the surface, the analysis results conflict with our intuitive expectations. Why should those who want to limit their dependence on money and energy resources not avoid work on an energy project? The apparent explanation is that many residents holding this attitude view the energy project as a means to achieve financial independence. The money earned over a short period can be used to purchase land, housing, and equipment thought to be necessary to lead a “self-reliant” life style. While we are in no position to judge the logic of this approach, the fact remains that measures of life style attitudes may not be particularly useful in predicting whether individuals will work directly on an energy project.

Figure 3-3 is a graphic summary of the analysis of employment experiences associated directly with the energy project. Personal characteristics which consistently explain differences in work experiences in both case study communities are connected to the dependent variable with a solid line. Dashed lines connect characteristics for which there is some evidence of a relationship. Personal characteristics not connected with the dependent variable by a line were tested in the analysis but showed no clear relationship. A negative or positive sign above each line indicates whether

FIGURE 3-3

SUMMARY OF RESULTS OF ANALYSIS OF WORK EXPERIENCES DIRECTLY CONNECTED TO THE ENERGY PROJECT



a given personal characteristic makes it more (+) or less (-) likely that a person will take a job directly connected with the energy project.

The analysis identified eleven personal characteristics which appear to affect the likelihood that a resident will work directly on an energy . project. Each of these characteristics can be measured before the development is started. In addition to these characteristics, the type of employer should also be determined and used in conjunction with the occupation variables. Persons employed by organizations which offer substantial long term benefits may be less likely to shift their employment. Most government jobs fit this category, particularly when jobs initially not offering long term benefits (teachers, for example) are eliminated. Another relevant measure in this regard would be the number of years invested in a particular job.

A key personal characteristic that we could not enter into the analysis of the work experience of the head was whether the head was employed or unemployed before the development started. We were able to test the importance of this variable for all adults in Valdez and found that it dramatically improves our ability to predict direct employment. Employment status is an obvious characteristic that should be determined.

COMPARISON OF DIRECT EMPLOYMENT EXPERIENCE BETWEEN RESIDENTS AND IMMIGRANTS

Now we have a better understanding of why work experiences on an energy project may differ among persons living in a community before a development starts. It is also important to compare the relative contributions of residents and immigrants to overall community changes. In this case, we find that, among the heads of household, immigrants are two to three times more likely than residents to work directly on the energy project (see Table 3-6).

Table 3-6

COMPARISON OF WORK EXPERIENCE OF HOUSEHOLD HEADS DIRECTLY ON THE ENERGY PROJECT

	Fairbanks			Valdez		
	Resident	Immigrant	Total	Resident	Immigrant	Total
directly employed on energy project	14	30	21	16	52	43
not directly employed on energy project	86	70	79.	84	48	57
	100	100	100	100	100	100
Number of Respondents:	233	166	399	85	132	229

Thus the aggregate change in employment is much greater than the change among existing residents alone. The difference in direct employment experiences would have been even larger if project employees that were housed in construction camps were included in the survey samples.

Change in Job Condition as an Indirect Effect of the Energy Development

CHANGES AMONG EXISTING RESIDENTS

The construction of a major energy development does not only create many employment opportunities directly. Subcontracts, purchases, tax payments and earnings spent by employees all fuel the local economy; as a result, new jobs are created indirectly by the energy project as well. The Fairbanks study questioned each person interviewed to identify those who felt that they had a better job because of the energy development.[11] Many,

[11] The question read, "Please. . . tell me. . . whether you agree or disagree and how strongly. . . (with the following statement), I have a better job now because of the pipeline." The categories were: agree strongly, agree somewhat, neither agree nor disagree, disagree somewhat, strongly disagree.

but not all, of those who answered yes were directly employed on the project. Responses to this question provide the basis for an analysis of changes in employment conditions as an indirect result of the energy project. Note, however, that the question does not identify all residents who had jobs indirectly created by the project. It only identifies residents who believe that their job improved as a result of the project. On the other hand, the question does go beyond the narrow definition of indirect employment which only includes entirely new job opportunities that can be somehow tied to the energy project. By relying on self-perceptions rather than limited factual information, we are able to capture a much larger proportion of the employment changes indirectly resulting from the energy project. Existing jobs can change as wages orbenefits are increased, for example.

Job improvements resulting from direct employment experiences are statistically removed by treating direct employment as an independent variable. In this way, we can focus on the prediction of indirect job improvement. We can then compare the relationships of all other independent variables in this analysis with the same independent variables used in the analysis of direct employment. The personal characteristics which make it more likely that a person will take a job created directly by the project may be quite different than the characteristics of residents who improved their jobs as an indirect result of the energy project. Figure 3-4 illustrates the relevant variables for the analysis of indirect job experiences as well as the variables entered into the analysis of direct employment. With the exception of the measure of direct employment experience used as a control, the independent variables in the two analyses are the same.

FIGURE 3-4

ANALYSIS OF INDIRECT EMPLOYMENT ON THE ENERGY PROJECT: HYPOTHESIZED RELATIONSHIPS

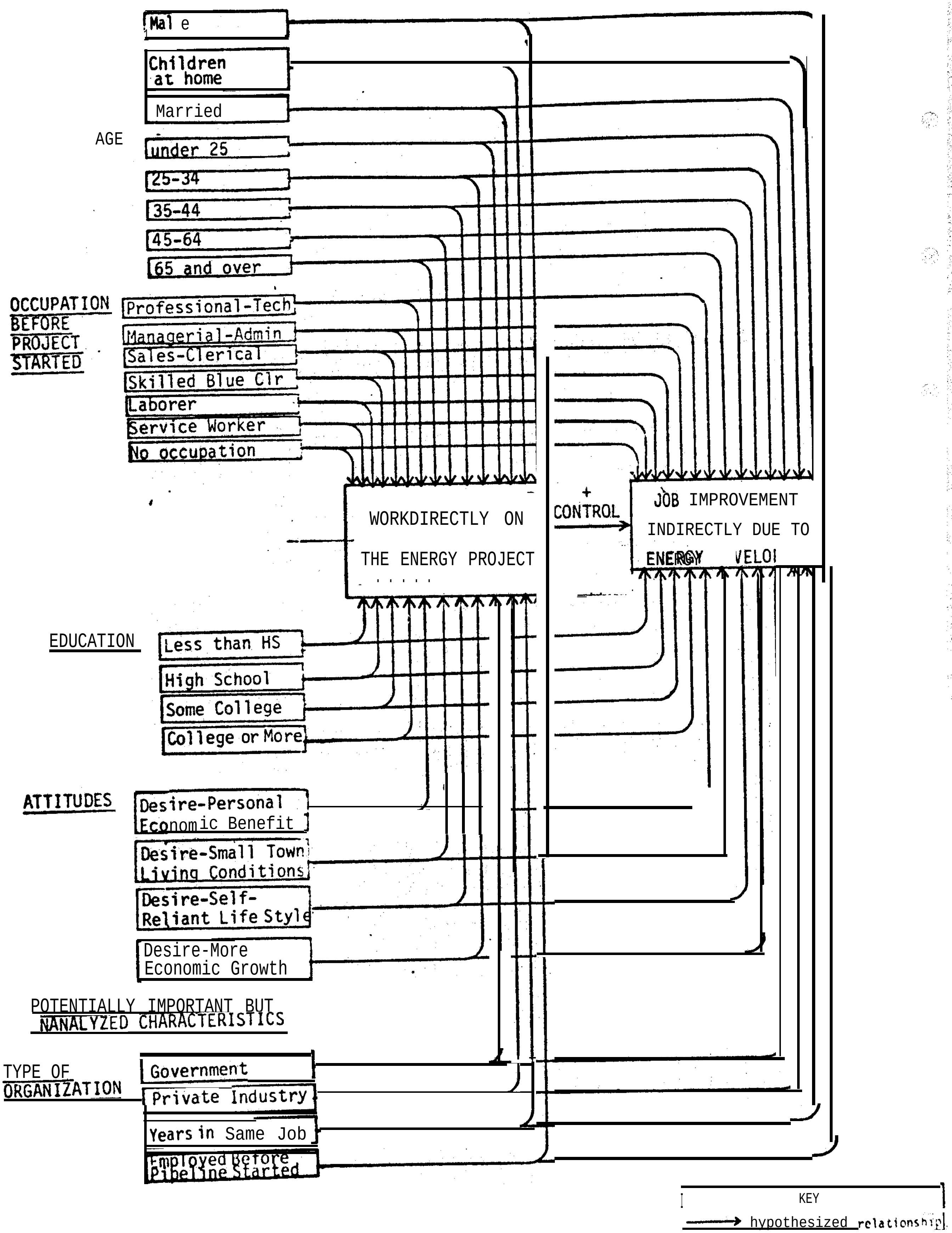


Table 3-7 compares the analyses results for direct and indirect employment. Several personal characteristics appear to increase the likelihood of employment related either directly or indirectly to the energy development.

A resident is more likely to have a direct or indirect employment experience with the energy project if he:

- is married
- does not have children
- is male
- is under 25
- is not between 45 and 64
- desires more personal economic benefits
- does not feel that living in a small community is important

These characteristics are probably important predictors of indirect employment experiences for the same reasons offered in the case of direct employment. Therefore, we can quickly turn to the personal characteristics that appear to have different relationships with direct and indirect employment experiences. First on our list are the age groups 25 to 34 and 35 to 44. The likelihood of direct employment consistently decreases with age in the Fairbanks case study. The effect of age on indirect employment is less pronounced and varies across age groups. We suspect the explanation lies partly with the fact that our measure of job improvement not only taps changes from one job to another but also changes in the characteristics of

TABLE 3-7

RESULTS OF ANALYSIS OF JOB IMPROVEMENT
AS AN INDIRECT RESULT OF THE ENERGY PROJECT

Characteristics of Head of Household	Fairbanks Results from Analysis of Indirect Employment	Fairbanks Results from Analysis of Direct Employment
Worked directly on energy project	+	(variable notin analysis)
Married	+0	+
Has children under 18	-0	
Male	+	+0
Age: under 25 years	+0	+
25-34	0	+0
35-44	+0	-0
45-64	-0	-0
65 and over	0	-
Predevelopment occupation		
Professional-technical		0
Manager-administrator		+0
Sales-clerical	0	+0
Skilled blue collar	0	-0
Laborer	-	+0
Service		0
No occupation	+	0
Education		
Less than high school	+0	-0
High school	0	-0
Some college	-0	+
College or more	0	-0
Desires more personal economic benefits	+	+
Desires small town living conditions		.
Desires Alaskan life style	+	0
‘Desires more community growth and development	+	0
R^2	.20	.23

Key :

Symbol	Meaning
+	significant positive
+0	non-significant positive
0	no relationship
-0	non-significant negative
-	significant negative
R^2	percent of variation explained by all independent variables

a single job. Thus, a resident might retain a job he has held for a long time but experience pay increases, better benefits or other job improvements that he attributes to the energy project. Of course, almost all residents who work directly on the energy project have to leave their predevelopment jobs. The older the resident, the more likely it is that he has invested many years in a job and the less likely he will be to leave it. But older residents do not have to leave their jobs to indirectly benefit from the energy project. This may explain why age is less important in the analysis of indirect employment.

Several interesting differences in the relationships of the occupation variables to direct and indirect employment can also be seen in Table 3-7. Residents in the two skilled white collar occupations are relatively less likely to believe their jobs improve as an indirect result of the energy project. This is undoubtedly due to the fact that those in skilled white collar occupations do not shift their employment during the energy project. Although many persons in this occupational group experience income gains that could be attributed indirectly to the energy project (examples: medical, legal and accounting fees charged to project employees), other, particularly blue collar, occupational groups experience relatively greater income gains. Skilled white collar workers are likely to measure changes in their own jobs against the changes other occupational groups experience.

What is more interesting is that no occupational group shows a significantly positive relationship to the indirect employment dependent variable (see Table 3-7). The observed positive relationship for those who had no occupation appears to make sense if it reflects a change from an unemployed to employed status. Unfortunately, when we directly compare persons who

who had no job prior to the development and persons who felt that they indirectly benefited from the development no relationship is evident. It appears, then, that the relationship reported in Table 3-7 may be a statistical artifact.

At least in relative terms, persons in skilled blue collar positions are less likely to perceive that their jobs have not improved as an indirect result of the energy project. We noted earlier that skilled blue collar workers in Fairbanks were not very likely to work directly on the energy project. The results of the analysis of indirect employment, while not particularly strong, may indicate that skilled blue collar workers gain more from the indirect employment created by demands for more housing, schools, roads and other community needs.

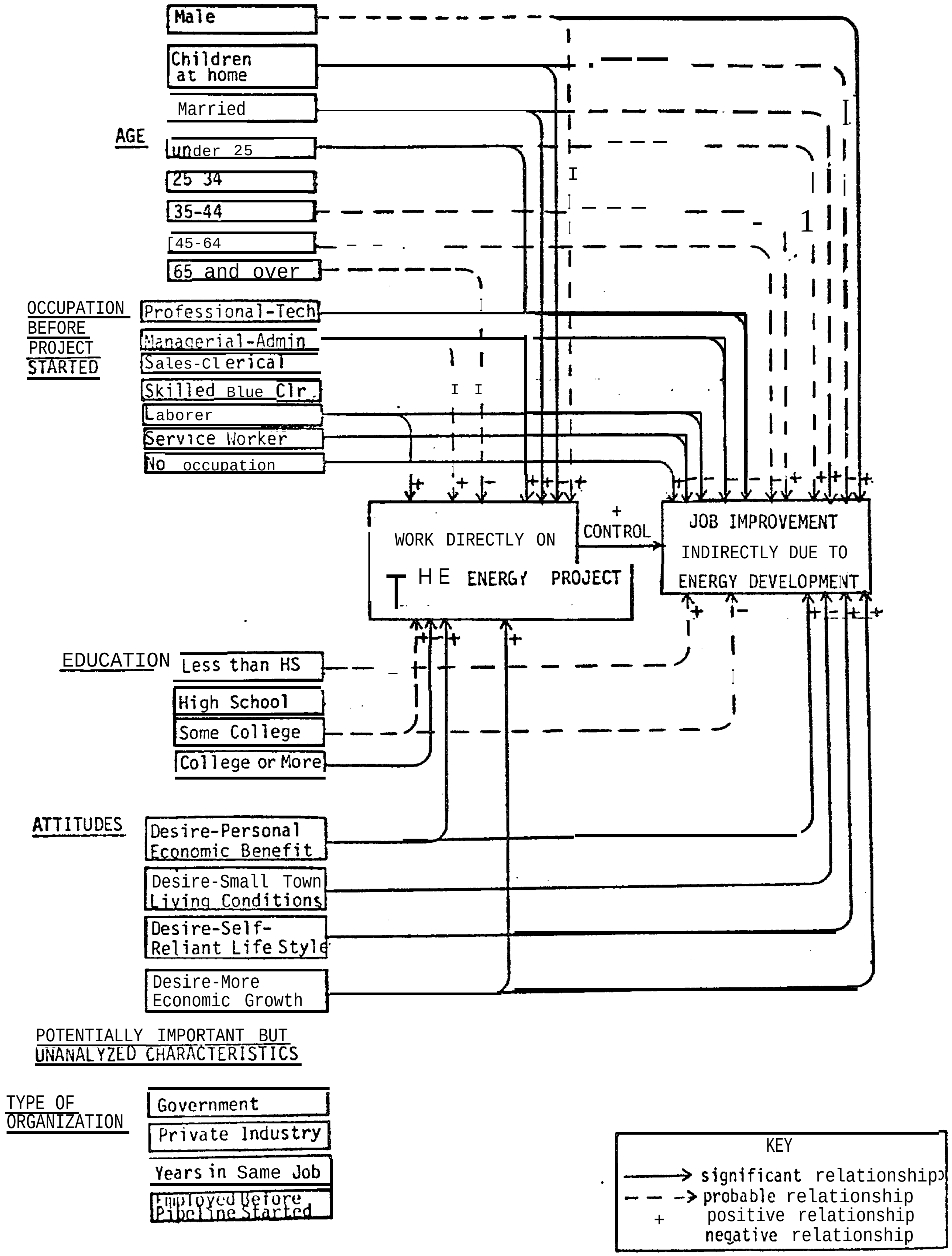
One potentially important finding of the indirect employment analyses is that residents lacking a high school education appear to be relatively more likely to believe that their jobs have improved as an indirect result of the energy project. While residents who have not completed high school are not very likely to work directly on the pipeline, indirect employment may serve as a rare stepping stone to a better job. However, the results reported in Table 3-7 suggest that the stone may not be very large; only a weakly positive relationship is shown for the lowest education category.

Finally, we have more evidence that a desire for a life style which stresses self-reliance does not conflict with short term energy development-related employment (see Table 3-7). It will be interesting to see if future research results show a similar result, particularly for Native Alaskans.

Figure 3-5 presents a cumulative summary of the results of the analyses

FIGURE 3-5

SUMMARY OF FIRST TWO ANALYSIS RESULTS: DIRECT AND INDIRECT EMPLOYMENT EXPERIENCE



of direct and indirect employment experiences. It is difficult to draw any simple conclusions with so many factors being considered. One plausible hypothesis is that personal flexibility and motivations are both important in determining whether a given resident will benefit from new employment opportunities. The four attitude variables can be thought of as motivations; they are reasons why a person may choose to change jobs, or to take a job. The financial responsibilities that come with marriage probably intensify economic motivations. Children, age, investments in career and education are all factors that in part determine how flexible a person is, indicating how easy it would be to change jobs.

If flexibility and motivation are important in the case of the trans-Alaska pipeline, there is a good chance they will be important characteristics to consider in OCS developments as well for they are not tied to a specific combination of outside forces for change. The relative unimportance of blue collar skills to direct or indirect employment suggests that we need not be too concerned with the match of new employment demands with the presence of specialized skills. Perhaps our occupation variables were too broad, but we suspect that the odds are against any community in Alaska possessing a labor force that can fill many of the skilled blue collar positions created directly by a project. Rather, most such jobs will have to be filled by new residents and transient workers.

COMPARISON OF INDIRECT EMPLOYMENT EXPERIENCES BETWEEN RESIDENTS AND IMMIGRANTS

By eliminating all persons who worked directly on the energy project from the sample, we are able to compare the indirect employment benefits experienced by resident and immigrant household heads. The results are shown in Table 3-8 and suggest that the two groups differ greatly. New residents clearly benefit more from indirect employment opportunities.

TABLE 3-8

COMPARISON OF INDIRECT EMPLOYMENT EXPERIENCES AMONG HOUSEHOLD HEADS[1]
(percent distributions)

	Fairbanks		
	Residents	Immigrants	Total
Agree strongly	7	25	13
Agree somewhat	12	11	11
Mixed	20	17	19
Disagree somewhat	14	19	16
Disagree strongly	47	28	41
	100	100	100
Number of Respondents:	110	57	167

[1] The question read: "I have a better job now because of pipeline activities: agree strongly, agree somewhat, neither agree nor disagree, disagree somewhat, strongly disagree."

This is surprising because we would expect many existing residents to be in a position to capitalize on the increase in economic activity. It suggests that a large proportion of existing residents are working in positions that cannot be used to derive benefits from the energy project. Another possibility is that many residents did not see a connection between their job and the energy project.

Change in Time Spent Working

CHANGES AMONG EXISTING RESIDENTS

Ten- or twelve-hour work days and six-day work weeks are common in large construction projects where time is at a premium. We expected that changes in employment opportunities would change the time devoted to work as well.[12] Since time is a scarce resource for everyone, substantial increases in work time are likely to take a toll on other time uses. Job changes are not the only possible cause of changes in work time. Normal career advancements are also important. For this reason, the analysis compares the importance of the normal reasons for changes in time spent working with the special reasons stemming from the energy development project. All analyses involving changes in time use were performed only on the Fairbanks data due to its unavailability in Valdez, and it also is restricted to changes experienced by the head of the household. The independent variable included in the analysis of changes in work time are diagramed in Figure 3-6.

As expected, by far the most important causes of increases in the time spent working are direct and indirect employment experiences on the energy project (see Table 3-9). Combined, they alone explain 17 percent of the variation in work time changes. The addition of all other independent variables only improves our ability to predict by 11 percent, to an overall R* of .28.

[12]The dependent variable for this analysis is based on a question which read, "I'm going to read a list of activities that you and your family spend time on. For each activity, please tell me whether you now spend more time than you spent on the activity three years ago, less time, or about the same amount of time. . . . Time the head of the household spends working on major occupation?"

FIGURE 3-6

ANALYSIS OF TIME SPENT WORKING: HYPOTHESIZED RELATIONSHIPS

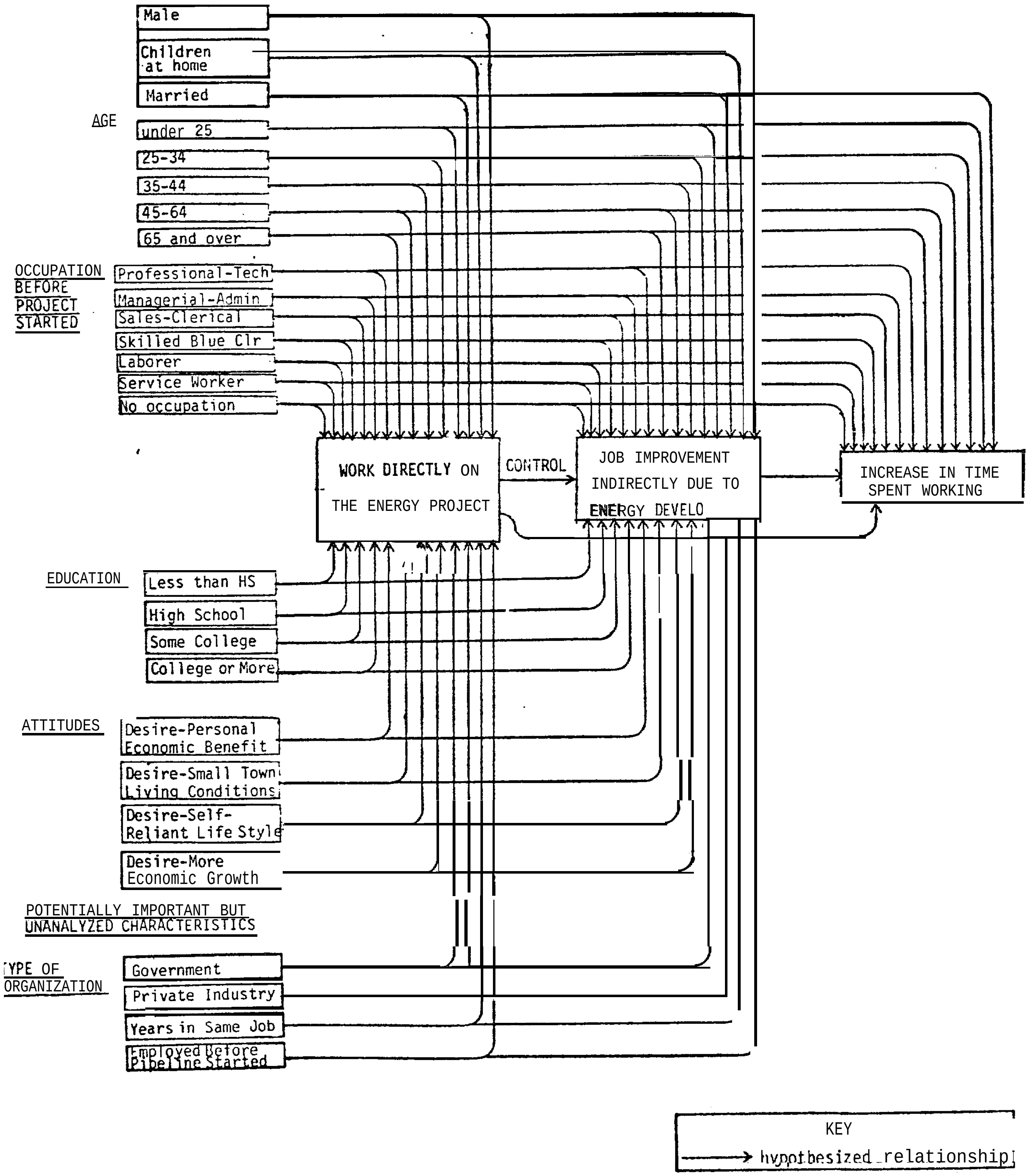


TABLE 3-9

RESULTS OF ANALYSIS OF WORK TIME CHANGES

Characteristics of Head of Household	Fairbanks
Work directly or indirectly on energy project	+
R^2 = .17	
Married	+
Age	
under 25	0
25-34	+
35-44	0
45-64	
65 years or more	0
Occupation	
Professional-technical	-0
Managerial-administrative	+-
Sales-clerical	0
Skilled blue collar	0
Laborer	0
Service	0
No occupation	0
R^2 = .28	

Key:

Symbol	Meaning
+	significant positive
+0	non-significant positive
0	no relationship
-0	non-significant negative
-	significant negative
R^2	percent of variation explained by all independent variables

Marriage again appears as a significant predictor of employment change. Remember that the effects of marriage on direct and indirect employment are already taken into account by entering the work experience variables. This means that marriage must exert a general influence on employment behavior. Work experiences directly or indirectly associated with the energy project are not an exception but part of the rule, although they represent perhaps a more extreme example.

We also expected that heads of household who were under 25 would generally increase the time spent working over a 3 year period. The expected relationship can be observed if we look only at age and changes in work time, but it disappears when energy project employment experiences are added. This suggests either, one, that the energy project offered an unusual opportunity for those just entering the workforce to become fully employed; or two, that not all heads of household in the under 25 age group want to work more and the energy project offers a good opportunity for most of those who do want to work more. The significant positive and negative relationships for the 25 to 34 and the 45 to 64 age groups, respectively, probably fit the normal career pattern although the degree of change may be more extreme.

Direct and indirect employment experiences account for most of the effects that otherwise would be observed for specific occupational groups. The relationship for the managerial-administrative category is interesting, however, in light of the analysis of indirect employment which showed that members of this occupational group are not likely to believe that their jobs have improved because of the pipeline. Their jobs may not have improved, but it appears that their jobs may have been changed, since they are significantly more likely to say that the time devoted to work has increased over the pipeline period. We suspect that the increasing work time expenditures may be involuntary and perhaps unwelcome.

In sum, the analysis of changes in the time spent working confirms our expectation that energy project work experiences are an important cause of work time changes. The effects of work experience are present over and above the changes one would normally expect as a result of marriage and increasing age. A cumulative summary of the analysis results is presented in Figure 3-7. Now let us turn to a comparison of residents and immigrants.

COMPARISON OF WORK TIME CHANGES BETWEEN RESIDENTS AND IMMIGRANTS

Given the observed higher levels of direct and indirect employment on the energy project for immigrants (see Tables 3-6 and 3-8), we would expect relatively more new residents to increase the time devoted to work. The results presented in Table 3-10 show our expectation was correct; over half of the immigrant heads of household increased the amount of time they spent working during the energy project construction period.

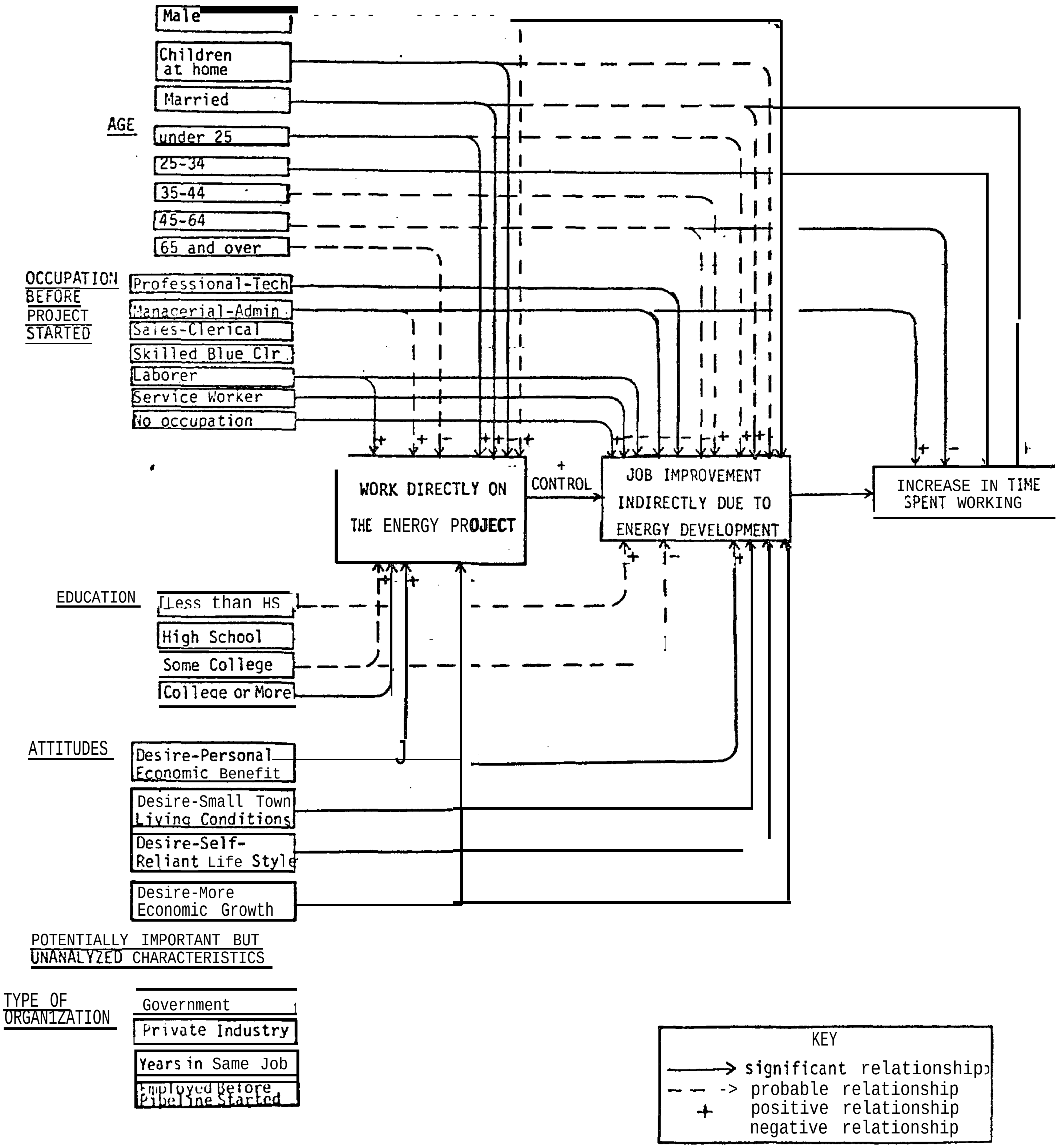
TABLE 3-10

COMPARISON OF CHANGES IN THE TIME DEVOTED TO WORK
(percent distributions)

	Fairbanks. Residents	Fairbanks. Immigrants	Total
More time	44	58	10
No change	45	32	40
Less time	11	10	50
	100	100	100
Number of Respondents:	240	168	408

FIGURE 3-7

SUMMARY OF ANALYSIS OF TIME SPENT WORKING



At best, increases in the time spent working may result in higher incomes or perhaps an accelerated rate of career advancement. At worst, other important uses of time must be sacrificed with uncertain consequences on personal and family happiness. Both income and time use changes may affect the community at large. Consumption of expensive goods or the need for family counselors may increase, for example. Because more immigrants increase the time devoted to work than existing residents, it follows that immigrants may make proportionally greater demands on the community. We shall see if the remaining analysis results tend to support or refute this theory.

Changes in Income

CHANGES AMONG EXISTING RESIDENTS

The word most often associated with the job opportunities created by major developments is money. Large increases in income offer the chance to make major new investments or to eliminate old debts. At the same time, residents whose incomes stay the same or even decrease face new difficulties as increasing demands dramatically inflate prices. The simple awareness that others are much better off is frustrating as well. The analysis first attempts to identify the characteristics of residents who experience large income increases. This group is composed of households whose incomes increased by $10,000 or more from what they had been prior to the development. It then tries to identify the characteristics of residents who do not experience even moderate increases in household income. Separate dependent variables were created for each analysis in both the Fairbanks and the Valdez data sets. The individual characteristics and experiences used to predict large income increases are shown in Figure 3-8. The measures of increasing work time and indirect employment are only available in Fairbanks. The independent variables used to predict who experienced no increase or declines in income are also illustrated in Figure 3-8. The only variable not included in the second analysis is the measure of increasing work time. Since the diagram of hypothesized relationships has become quite complex, it may be worth relisting the personal characteristics and experiences entered into the two analyses:

- direct work experience on the energy project
- indirect work experience on the energy project (Fairbanks only)
- marital status
- presence of children
- sex
- age
- occupation
- desire for personal economic benefits
- desire for small town living conditions
- desire for a self-reliant life style
- desire for more community growth
- increase in time spent working (Fairbanks analysis of large income increases only)

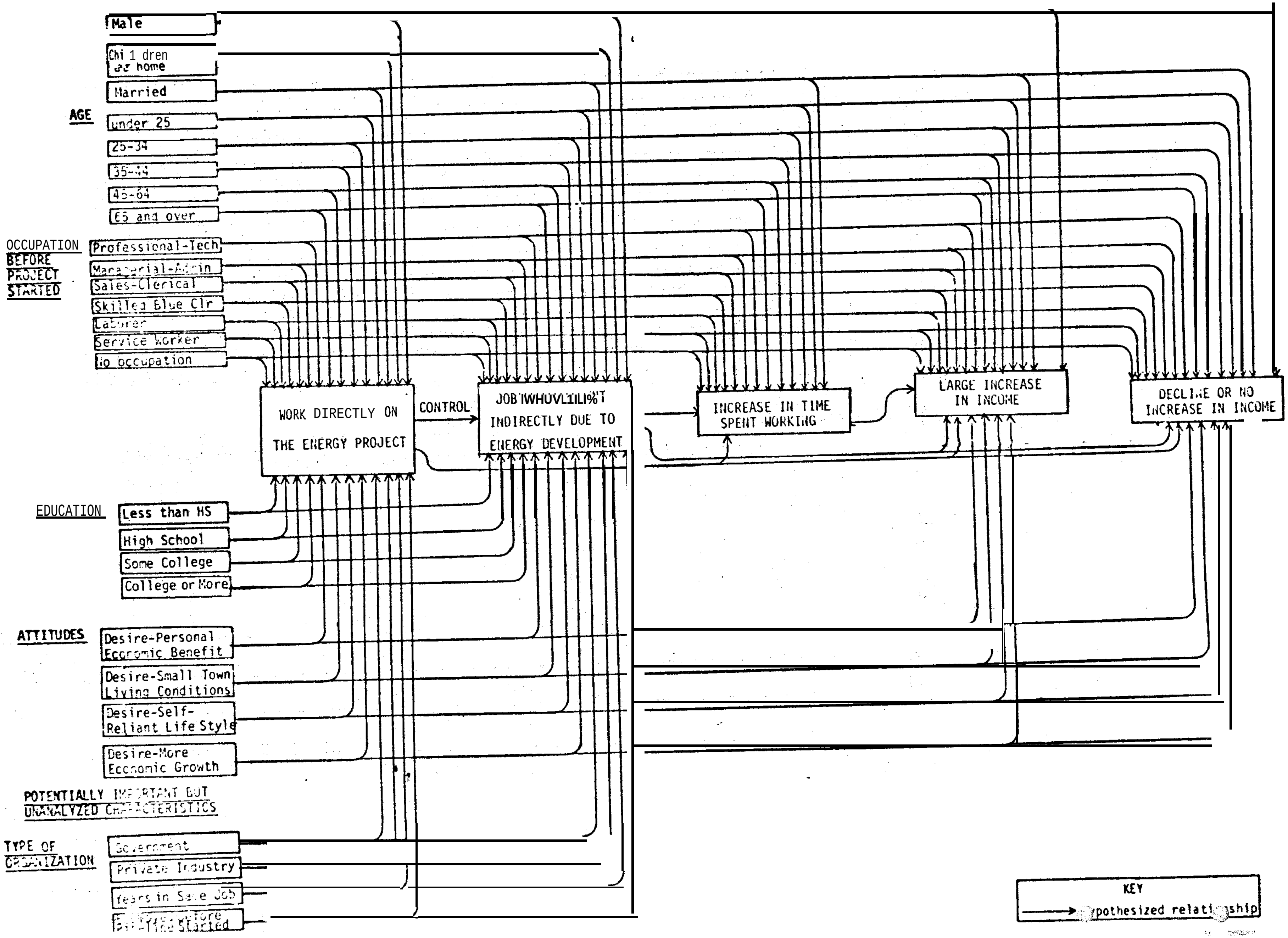


FIGURE 3-8
ANALYSIS OF INCOME CHANGES: HYPOTHESIZED RELATIONSHIPS

The results of the analysis of large income increases are displayed in Table 3-11. Direct work experience on the energy project, as expected, proved to be a significant predictor in both communities. The Fairbanks measure of indirect work experience also is a significant predictor.

Increases in time spent working on jobs not associated with the energy development do not appear to result in large income increases. This suggests that many residents who find themselves working longer hours are paid on a fixed salary basis.

The Fairbanks analysis results concerning the effects of being a male or female household head on large income increases is interesting. Women heads of household are relatively more likely to experience large income gains than male heads of household. This may reflect a relative increase in employment opportunities and wage rates for women during the energy project construction period in Fairbanks. We suspect that most of these employment changes occur in the service and trade sectors which are larger in Fairbanks than in Valdez. The relatively small service and trade sector in Valdez may explain why female heads of household were not more likely than males to experience large income increases.

Referring still to Table 3-11, married heads of household in Valdez are observed to be more likely to experience large income increases, even when the effects of direct work experience on the energy project are controlled. Remember that married heads are more likely to work directly on the energy project. The lack of an observed marriage effect in Fairbanks is probably not an inconsistency but rather that the combination of direct and indirect employment experiences captures most of the marriage effect.

TABLE 3-11

RESULTS OF ANALYSIS OF LARGE INCOME INCREASES

	Fairbanks	Valdez	Assignment of Relationship
Direct work experience on energy project	+	+	C
R^2	.11	.(?5	
Indirect work experience related to energy project	+	not available	
R^2	.16	not available	
Increase in time spent working	0	not available	
Male	-	0	I
Married	0	+	I
Age: under 25	-0	0	N
25-34	0		I
35-44	0		I
45-64	-0	-	C
65years or more	+0	.	I
Predevelopment occupation			
Professional-technical	+0	-0	N
Manager-administrator	+	0	I
Sales-clerical	0	+	I
Skilled blue-collar	+	-	I
Laborer	0	0	N
Service	0		I
No occupation	0	.	I'
Attitudes			
Desires more personal economic benefits	0	0	N
Desires small town living conditions	0	0	N
Desires Alaskan life style	-0		C
Desires inure community growth and development	-0	0	N
R^2	.25	.34	

Key:

Symbol	Meaning	Consistent Relationships	Inconsistent Relationships	Assignment of Results
+	significant positive	+ and +	+ and -	C=Consistent
+0	non-significant positive	+ and +0	+ and -0	I=Inconsistent
0	no relationship	- and -0	+ and 0	N=No relationship
-0	non-significant negative	- and -	- and 0	
-	significant negative		- and +0	
R^2	percent of variation explained by all independent variables			

We will see that in our analysis of income decreases, marriage plays a consistent role in both communities.

The strong negative effects of increasing age on large income gains in Valdez is not matched in Fairbanks. Age does not appear to influence the likelihood of receiving large income increases much at all in Fairbanks. We suspect the negative relationship of age and income gains in Valdez partly results from the fact that older residents are more likely to be employed in public service jobs which receive only moderate income increases.

As in the analysis of direct employment experiences, the occupation variables do not have consistent relationships to large income increases in the two case study communities. Information concerning the employer has already been mentioned as a likely way to reduce the apparent inconsistencies. The occupation-employer relationship probably explains the negative relationship of service occupation to large income increases; Valdez residents in service occupations were mostly employed by the state and did not receive substantial salary increases.

The occupation-employer relationship also may explain the difference in the relationship between skilled blue collar workers and large income increases. Over half of the skilled blue collar workers in Valdez are employed by government, particularly in the Department of Highways, with the same results as we have just observed for the service workers. The contrasting significant positive relationship in Fairbanks suggests that many skilled blue collar workers there substantially increased their incomes as a result of a general increase in construction. It also suggests that these blue collar workers are not making a connection between the general increase in economic activity and the energy project. If they did, the explanatory power of the skilled blue collar category would probably be captured in the indirect employment variable.

Although increases in the time spent working do not appear to have a direct positive effect on income, work time increases may explain why the manager-administrator category in Fairbanks shows a significant positive relationship with large income increases (see Table 3-11). In the analysis of work time changes, we observed that the managerial-administrative category is the only occupational variable to show a positive relationship with work time increases. Perhaps increases in the time spent working are translated into income increases as well.

Among the attitude measures, only the desire for a self-reliant life style appears to affect whether or not a resident experiences large income gains. This finding may appear inconsistent with the findings of our earlier analyses which indicated that residents who desire a self-reliant life style do not avoid short term high income jobs. It makes sense, however, ifwe remember that the effects that can also be explained by direct and indirect employment experiences are statistically removed. Residents who desire a self-reliant life style appear to be either choosing short term high paying jobs with the energy project or choosing jobs which do not increase their incomes substantially. In other words, the direct and indirect employment experiences capture the positive income effects of a self-reliant life style orientation. The residual relationship is negative in both communities.

In sum, large income increases are partially explained by direct and indirect work experiences on the energy project (see Figure 3-9). Most of the personal characteristics entered as potential predictors do not show consistent effects in both communities. The most important apparent reason for these discrepancies is that the type of employer is not entered as a variable in the analysis but does exert an important influence on income change. The inclusion of this variable in future research should considerably reduce the inconsistencies.

Relative Declines in Family Income

CHANGES AMONG EXISTING RESIDENTS

Dramatic increases in income generally receive the greatest publicity in impact situations. Equally or more important, however, are cases involving individuals whose incomes remain static or actually decline. Given the highly inflationary costs for goods and services in a local economy under impact, those whose incomes fail to increase can obviously be subject to extreme economic hardships. In both Fairbanks and Valdez declines in income were defined as families whose income had not changed, or actually declined, during the impact period.

The same independent variables used to analyze increases in income were used to predict income declines, with the exception of increased time spent working. These hypothesized relations are diagramed in Figure 3-8. The effect of these personal experiences and characteristics are shown in Table 3-12. Consistent relationships in both case communities show that families are more likely to experience declines if the household head:

FIGURE 3-9

SUMMARY OF ANALYSIS OF INCOME INCREASES

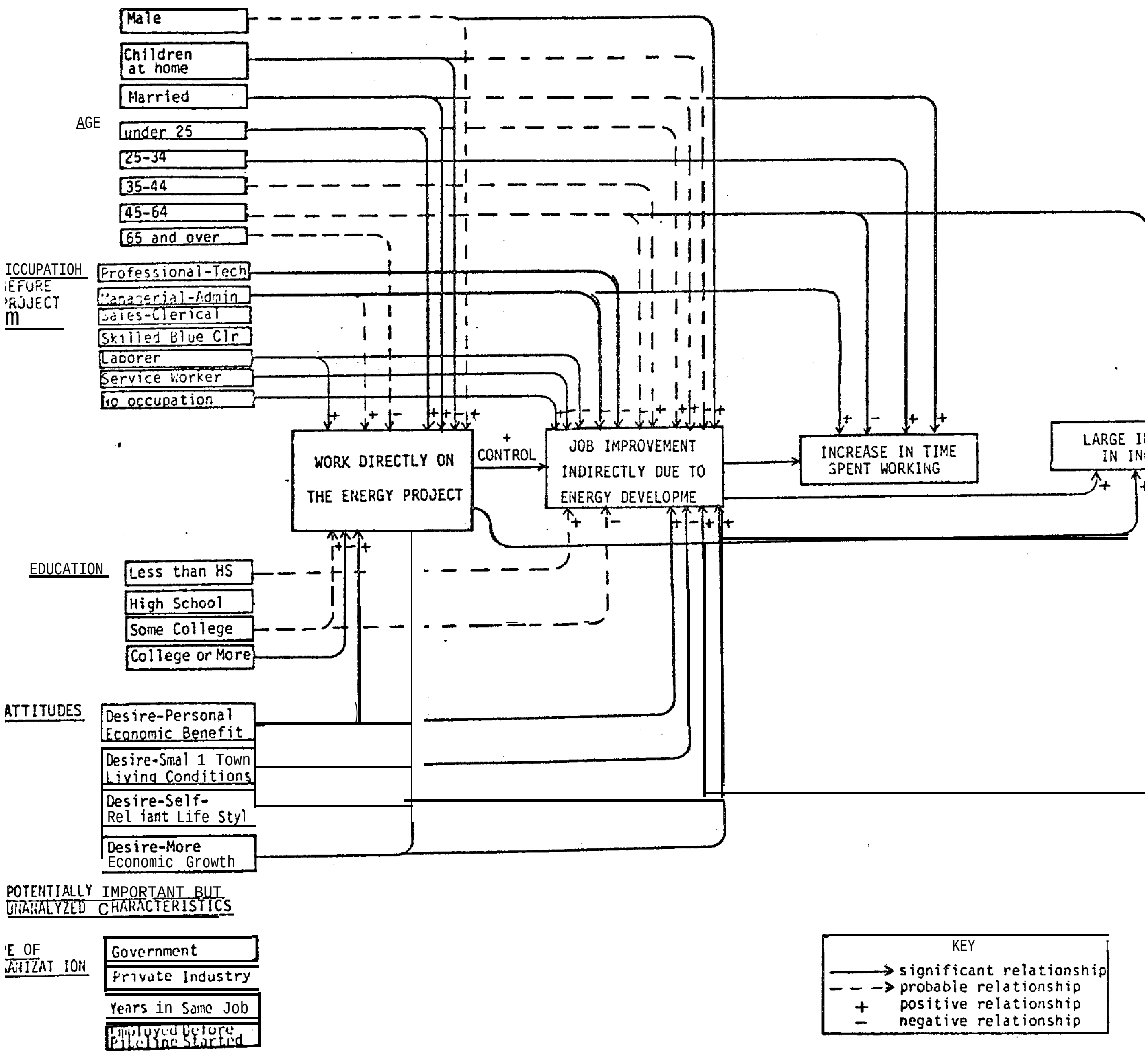


TABLE 3-12

RESULTS OF ANALYSIS OF INCOME DECREASES

haracteristics of Head of Household	Fairbanks	Val dez	Assignment of Results
Personal Experiences			
Worked directly on energy project			C
Indirect work experience		not available	
R^2	.03	.04	
Personal Characteristics			
Male	+	+	C
Married	.-0	.	C
Age: under 25 years	+0	0	N
25-34	0	0	N
35-44	0	0	N
45-64	0	0	N
65 and over	+	0	I
Predevelopment occupation			
Professional-technical	-0	0	N
Manager-administrator	0	0	N
Sales-clerical	0	0	N
Skilled blue collar	0	0	N
Laborer	+	0	I
Service	0	0	N
No occupation	0	0	N
Desires more personal economic benefits	0	-	I
Desires small town living conditions	0	0	N
Desires Alaskan life style	0	0	N
Desires more community growth and development	0	-0	N
R^2	.13	.22	

Key :

Symbol	Meaning	Consistent Relationships	Inconsistent Relationships	Assignment of Results
+	significant positive	+ and +	+ and .	C=Consistent
+0	non-significant positive	+ and +0	+ and -0	I=Inconsistent
0	no relationship	- and -0	+ and 0	N=No relationship
-0	non-significant negative	- and -	- and 0	
.	significant negative		- and +0	
R^2	percent of variation explained by all Independent variables			

- is not employed on the energy project

- does not experience indirect job benefits from the project (tested in Fairbanks only)

- is male

- is not married

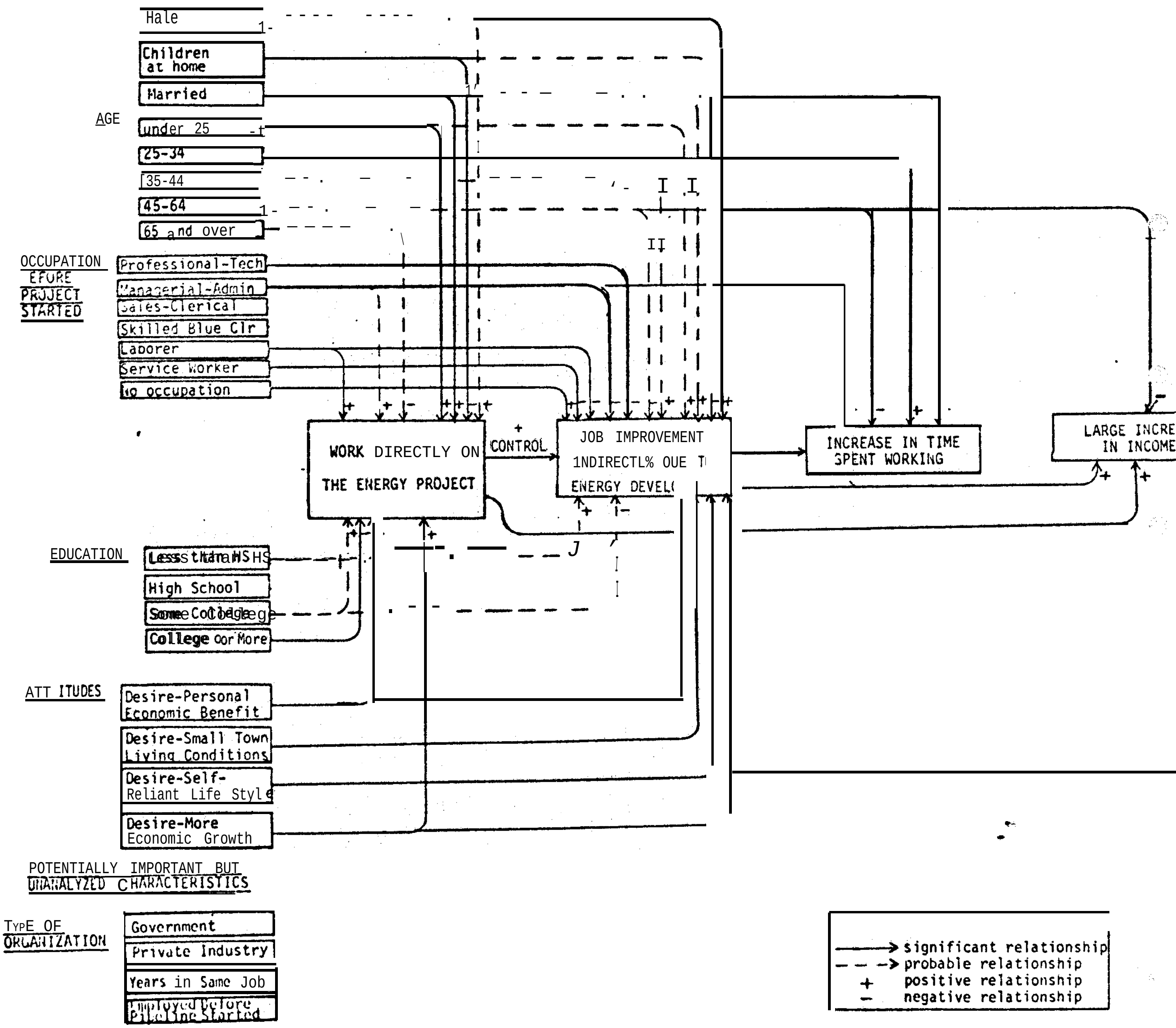
Unfortunately, relatively small proportions of variance are explained by these and the other independent variables. In Fairbanks the R^2 value is .13 and in Valdez, .22. Given the vast array of other factors that would more directly effect family income levels, however, such as unemployment or changes in the number of working members in a family, these results are acceptable for the purposes at hand.

As would be expected, direct work on the energy project is negatively related to income declines in both communities. In Fairbanks, this is also true of those who receive indirect benefits from the project. These relationships are consistent with the results obtained for large increases in income. They substantiate the commonly held assumption that work associated with a construction project is the greatest safeguard against declining incomes at least over the short term. Conversely, those who fail to redirect their work to the energy project are most susceptible to income declines.

Larger proportions of the total variance in both Fairbanks and Valdez are explained, however, by the personal characteristics of household heads. In both communities male heads are more likely to experience declines than women. This change is obviously not due to direct employment on the project

FIGURE 3-9

SUMMARY OF ANALYSIS OF INCOME INCREASES



of the elderly on fixed incomes, an important variable which should be considered in future research. In the smaller community of Valdez, fewer of the elderly were probably on fixed incomes, and more held business or real estate interests from which additional income could be realized during the construction period.

Similar to age, minimal relationships were found between occupational categories and declining incomes. In the case of Valdez, no significant relationships are evident. Here both skilled blue collar and service workers, with their concentration in public employment, had been negatively associated with large income gains. Both were also positively associated with income declines, but the results were not close to significant given the small increases that did occur in government salaries. In Fairbanks laborers were positively associated with income declines. This is not to say that all laborers experienced declines; those transferring into direct and indirect pipeline employment experienced gains that would be explained by variance in these two latter variables. Instead it was laborers whose work remained unaffiliated with pipeline construction that experienced income declines. In Valdez, most laborers transferred into pipeline employment. The smaller size of the local labor pool also resulted in a greater spillover of higher wages into the non-pipeline economy, which would account for an absence of relationship in Valdez.

Personal attitudes were also found to bear little relation to declines in income. The only significant relationship was found in Valdez, where desires for personal economic benefits were negatively associated with income declines. The same relationship was found for Fairbanks although the contribution was neither strong nor significant. The same consistent and negative relationship was found with positive attitudes toward growth; it contributed negatively in both communities although even in Valdez it was not significant.

The summary relationships for declines in income are presented in Figure 3-10. They show that direct and indirect construction employment serve as definite safeguards against declining incomes in an impact situation. In addition, consistent relationships were found in which both female and married household heads were negatively associated with relative declines in family income. In contrast, the elderly appeared particularly susceptible to income declines, unless few were on fixed incomes as was the case in Valdez. Attitudinal and occupational criteria were found to contribute little to the explanation of income declines. Desires for personal economic gain apparently serve as a motivational force against income declines; in Fairbanks laborers whose work was not associated with the pipeline were also more likely to experience declines in family income.

COMPARISON OF INCOME CHANGES BETWEEN RESIDENTS AND IMMIGRANTS

Changes in household incomes between 1974 and 1975 for residents and immigrants are reported in Table 3-13. In both communities, a higher proportion of immigrants experienced large income increases. Incomes earned outside Alaska were inflated by one-third to adjust for the higher cost of living in Alaska, so the greater immigrant income increases are not simply a reflection of recent moves to Alaska. Interestingly, 21 percent of the immigrants to Fairbanks experienced no gain or a decline in income when adjusted for differences in the cost of living--only 6 percent of the Fairbanks resident population experienced no gain or a decline. The

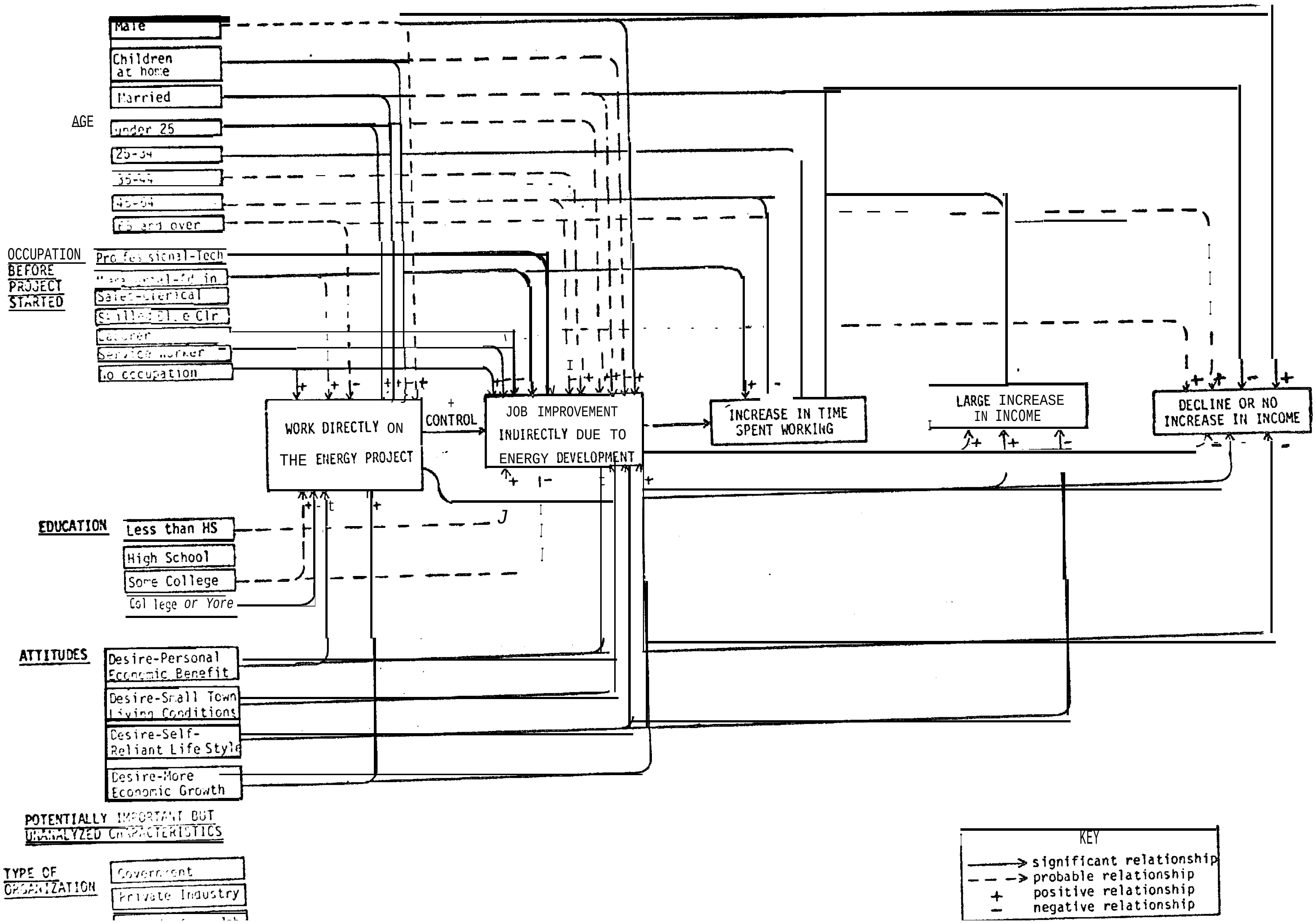


FIGURE 3-10
SUMMARY OF RESULTS OF ANALYSIS OF INCOME DECLINES

TABLE 3-13

COMPARISON OF INCOME CHANGES (1974-1975) BETWEEN RESIDENTS AND IMMIGRANT HOUSEHOLDS
(percent distributions)

Income Change	Fairbanks			Valdez		
	Residents	Immigrants	Total	Residents	-rants	Total
increase of over $20,000	7	26	15	37	47	39
increase of $10,001 to $20,000	15	17	16	25	20	24
increase of up to $10,000	44	20	34	21	20	21
no change	28	16	23	12	7	11
decline	6	21	12	5	6	5
	100	100	100	100	100	100
Number of Respondents:	222	165	387	75	15	90

Valdez results suggest that immigrants and residents experienced a similar mix of income changes. The Valdez immigrant sample, however, is very small (only fifteen households) and does not include immigrants who arrived in 1975 for whom no data on prior incomes was available. We suspect that, as in Fairbanks, some people who moved to Valdez during the energy project were not able to find or take advantage of the new employment opportunities. If this assumption is correct, then immigrants appear likely to contribute to overall community change in two ways. First, more immigrant households experience large income increases than resident households. As a result, immigrants may spend more (and/or save more) than residents. Second, more immigrant households experience income declines. This may mean that immigrants exert a relatively greater pressure on public and private social service agencies for help.

Changes in Time Spent with Family, on Outdoor Recreation, Visiting and Hunting and Fishing

CHANGES AMONG EXISTING RESIDENTS

We have already seen that employment experiences which are indirectly or directly related to an energy project are a cause of increases in the time devoted to work. Increases in work time were in turn mentioned as a possible cause of income and time use changes. In the preceding analysis, we found that energy related employment is the most important predictor of large income increases while increases in the time spent working by itself is not important. Increasing work time may still prove to be an important cause of decreases in other time uses.

As work time increases, it stands to reason that other time uses decrease. The other time uses for which we have data include time spent with family, on outdoor recreation, visiting and time spent hunting and fishing. The survey questions on time use asked residents whether they were spending more, less or the same amount of time on each activity during the peak of the energy development than they were before the development started. The analysis, then, focuses on short term and perhaps temporary changes in time use. While reported changes in time use may not last for more than a year or two, their effects may be long term. A father's or a husband's absence could permanently strain family relationships, for example. We cannot say what the effects will be of short term changes in time use. We can determine if residents believe that their use of time changes and whether a change in work time is an important cause of other time use changes. If large time use changes have occurred as a result of increases in the amount of time devoted to work then we have identified a potentially important set of social changes. Figure 3-11 adds the time use variables to all of the variables entered in the analyses thus far.

Preliminary analyses of changes in time use included a number of personal characteristics in addition to the principal variable, change in time spent working. None of the personal characteristics proved to be important and so they were eliminated in subsequent analyses. Residents who spent more time working, however, did have to reallocate their time (see Table 3-14). The most important effect is on the time the family can be together. The time devoted to outdoor recreation and to visiting appear to be moderately affected by changes in time spent working. Interestingly, the time spent on subsistence activities is only weakly affected by changes in the time spent working. This finding is particularly important if it holds true in an analysis of Native Alaskans.[13]

TABLE 3-14

EFFECTS OF INCREASING TIME SPENT WORKING ON OTHER TIME USES

	Effect of Increase in Work Time in Fairbanks Households[1]	R^2 [2]
Time with family		.21
Time spent visiting		.14
Time spent on outdoor recreation		.10
Time spent hunting & fishing		.03

[1]A negative sign in each case indicates a significant relationship where increases in work time tend to result in decreases in other uses of time.

[2]R-squared (R^2) is the percent of variation in each of the time uses listed on the left side of the table that is explained by increased work time.

[13]We have some evidence that it does hold among the Athabascan and Inupiat.

COMPARISON OF TIME USE CHANGES BETWEEN RESIDENTS AND IMMIGRANTS

The comparison of time use changes shown in Table 3-15 suggests that new residents do not experience substantially different time reallocations than existing residents, despite the fact that more new residents possibly increase the time they spend working. Changes in work time among new residents do not have as severe an effect on other activities possibly

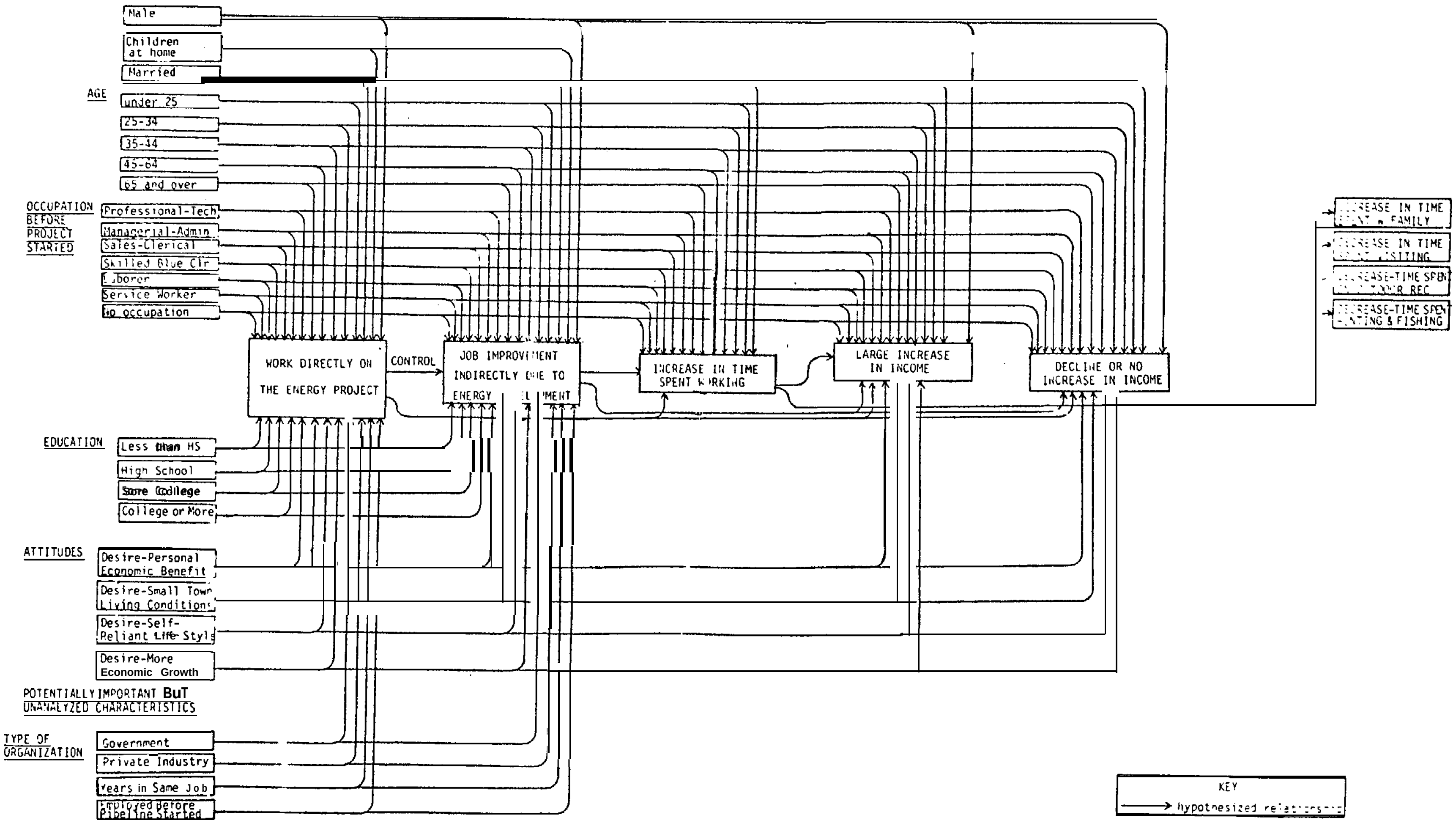
TABLE 3-15

COMPARISON OF TIME USE CHANGES

	Residents	Immigrants	Total
Time Working			
More	44	58	50
No change	45	32	40
Less	11	10	10
	100	100	100
Time with Family			
Less	39	41	40
No change	49	44	46
More	12	15	14
	100	100	100
Time Spent Visiting			
Less	29	42	34
No change	57	42	51
More	14	16	15
	100	100	100
Time Spent on Outdoor Recreation			
Less	37	44	40
No change	47	38	43
More	16	18	17
	100	100	100
Time Spent Hunting & Fishing			
Less	30	26	29
No change	63	66	64
More	7	8	7
	100	100	100
Number of Respondents:	240	168	408

FIGURE 3-11

ANALYSIS OF TIME USE CHANGES: HYPOTHESIZED RELATIONSHIPS



because new residents are not as likely to have families or close friends, or to be as active in outdoor activities. As a result, they may be able to increase the time devoted to work without sacrificing other activities.

Changes in the Consumption of Housing, Major Appliances, Cars and Other Costly I terns

CHANGES AMONG EXISTING RESIDENTS

Changes in the consumption of costly items are clearly important to local businesses. Consumption of these items may result in major improvements in personal living conditions as well. On a longer term, large purchases involving installment payments may become a severe burden as employment opportunities diminish and incomes drop. A limited amount of information on major purchases is available from the Fairbanks survey. As a result, we are able to begin to look at individual differences in consumption patterns. Figure 3-12 illustrates the variables included in the analysis.

Interestingly enough, consumption levels appear to be more dependent on moderate income increases than on large income increases (see Table 3-16). This is true both for housing and land as well as for other costly items. Perhaps residents tend to view large income increases as a chance-to save for major purchases in the future. In any case, it does not appear that residents who substantially increase their incomes are especially active consumers.

The results shown in Table 3-16 also suggest that major purchases are more likely to be made by young married people and people who do not have a strong desire to live a self-reliant life style. It makes sense that people with these personal characteristics are more active consumers.

TABLE 3-16

RESULTS OF ANALYSIS OF CONSUMPTION

	Purchase of House or Land in Last 12 Months	Purchase of Costly Items in Last 12 Months
Large increase in income	0	0
Moderate increase in income	+	'4
Age: under 25	+0	+0
25-34	+	+
35-44	+0	0
45-64	-0	0
65 years and over		-0
Married	+	+
Children at home		0
Desire for a self-reliant life style		-
R^2	.11	.08

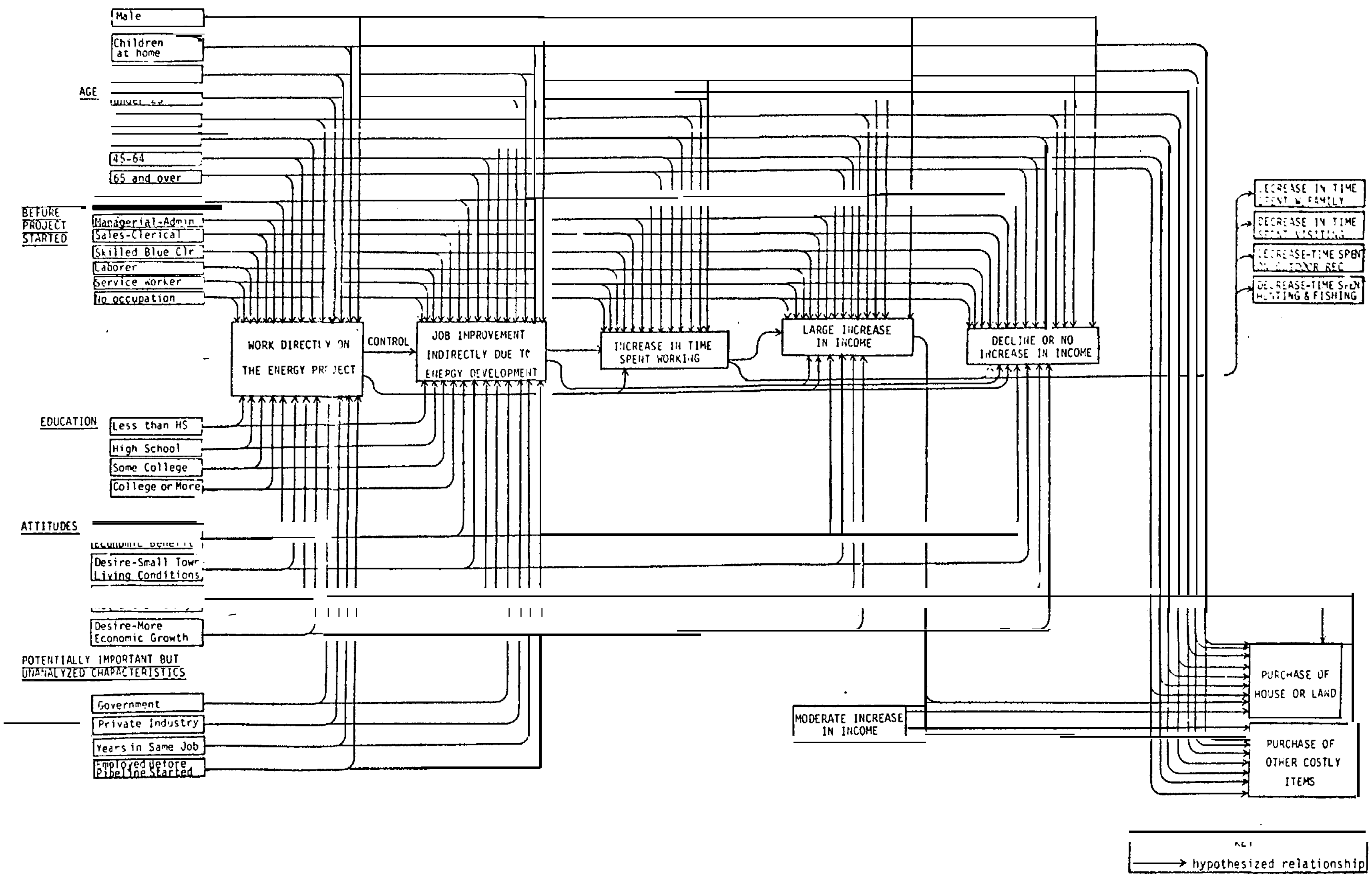
Key:

Symbol	Meaning
+	significant positive
+0	non-significant positive
0	no relationship
-0	non-significant negative
-	significant negative
R^2	percent of variation explained by all independent variables

They probably would make more purchases than other people even in an economy that is not heated up by a major energy development. What we suspect but cannot prove with statistics is that a major energy development does not result in a different type of people becoming the most active consumers but it does increase the rate of consumption for most residents. It should be noted, however, that all of the variables used to predict consumption combined do not perform very well (R^2 values are only .11 for housing or land purchases and .08 for other purchases). This suggests either we have missed some important reasons why purchases are made (like

FIGURE 3-12

ANALYSIS OF CHANGES IN CONSUMPTION: HYPOTHESIZED CHANGES



specific needs and situations) or that purchases made over twelve months do not cover a long enough time period to give a good picture of consumption patterns. The analysis results are summarized in Figure 3-13.

COMPARISON OF CONSUMPTION PATTERNS BETWEEN RESIDENTS AND IMMIGRANTS

Since new residents generallyexperienced greater income increases than existing residents, one might expect that they would consume more than existing residents as well. As the results in Table 3-17 show, this assumption is incorrect. In fact, exist" ng residents are slightly more likely to make major purchases. New res· dents may not show the expected rate of consumption because most of them do not plan to remain in the community beyond the construction of the energy project. They may choose to save their money rather than purchase costly items that are difficult to move. As a result, the income received by a new resident does not typically generate as much economic activity as does the income received by an existing resident.

TABLE 3-17

COMPARISON OF CONSUMPTION PATTERNS BETWEEN RESIDENTS AND IMMIGRANTS (percentage distributions)

	Fairbanks		
	Residents	Immigrants	Total
Purchase of Housing or Land			
Yes	25	19	22
No	75	81	78
	100	100	100
Purchase of Other Costly Items			
More than one	42	33	38
One	33	39	36
None	25	28	26
	100	100	100
' Number of Respondents:	240	168	408

Changes in How Good the Community Is Seen as a Place to Live

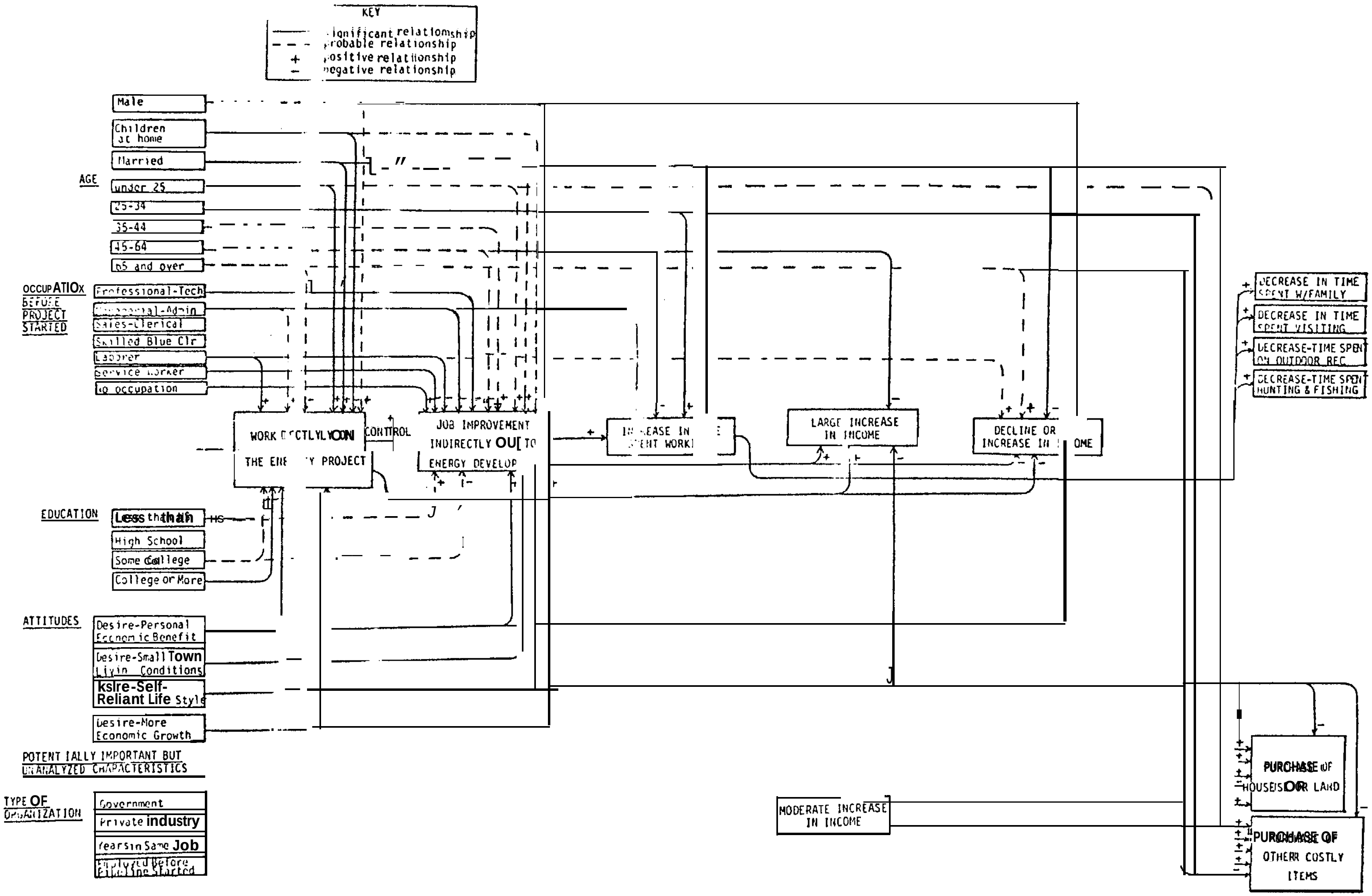
CHANGES AMONG EXISTING RESIDENTS

The link between the Community Level Change and Individual Level Change components of the Predictive Indicator Study is clearest here.[14] The Community Level Change analysis took five major types of change and attempted to identify community characteristics which affect how outside forces for change are translated into actual community changes. The five areas were: telephone and electric utilities, medical care, schools, housing and retail trade. Changes in these five areas were measured as the amount of goods or services available compared to the amount needed. Another possible measure of change is provided by the public itself. Residents are able to say whether conditions are getting better or worse for any community good or service they are asked about. They are also able to give an overall assessment of community change. These public assessments of change are often the only measures available since it is difficult or even impossible to obtain physical measures for many community changes. Public assessments of entirely different types of community changes can also be directly compared. While a researcher cannot physically compare a change in air quality to a change in the cost of housing the public can and does when assessments are made. In fact, only the public can tell us which changes are important to the overall quality of the community as a place to live.

[14] For readers who have skipped or forgotten the discussion of the Community Level Change component, its purpose is to identify community characteristics which can be used to predict how a community will respond to the demands arising from a major energy development. The analysis focuses on changes which are experienced by most residents and on community rather than individual characteristics,

FIGURE 3-13

SUMMARY OF RESULTS OF ANALYSIS OF CONSUMPTION CHANGES



Community changes will vary from community to community as a result of differences in the community characteristics identified in Chapter Two. Consequently, public assessments of change in Fairbanks and Valdez may well differ from assessments in other communities. Since differences in assessments probably will depend more on community characteristics than on individual characteristics, we cannot depend on individual characteristics to explain how community assessments will differ across communities. For this reason, the objective of the analysis of public reactions to community level changes is different than that for the other major areas of change. In this case, we do not expect to greatly improve our ability to predict change on the basis of knowing the relationships between individual characteristics and community change assessments. Instead, we want to see whether our list of specific community changes appears to cover the types of changes upon which residents base their overall assessments of specific changes. The dependent variable for the analysis is an individual assessment of whether the community as a whole changed for the better, the worse or whether it was just as good a place to live during the peak of development activity as it was before the development started. The specific assessments used as independent variables include the five areas of community change studied in the Community Level Change component, but many other specific assessments were included as well. As a result, we are able to observe how changes in the specific assessments chosen for detailed study compare to a much larger set of community changes.

The second analysis objective is to find out which specific assessments are significant predictors of an overall assessment of change in at least one of the case study communities. Remember that in this analysis we are not looking for consistencies among the specific assessments, since each community's experiences may be different. Some specific community changes may only occur in one case study community and thus not be a good predictor in the other community.

Community assessments depend mostly on changes that are experienced by the community as a whole. Individual experiences can be expected to vary somewhat, however, Even if everyone shares the same experiences, individuals may view the changes differently. Some people may be particularly aware of one type of change and choose to ignore other types. As a check on the influence of individual differences on an overall community assessment, several personal characteristics were included as independent variables along with the specific community assessments.

All of the variables included in this analysis, plus a cumulative summary of the hypothesized relationships for the preceding analysis are illustrated in Figure 3-14. Changes that are subject to analysis in the Community Level Change component (see Chapter Two) are marked by an asterisk. Assessments of specific community changes which were only made in Fairbanks are also identified in Figure 3-14. All in all, twenty-eight specific community assessments were tested in at least one of the case study communities.

Table 3-18 summarizes the analysis results. Looking first at the specific community assessments, we find that eight of the eleven assessments tested in Fairbanks combine to achieve a good prediction of overall community change (an R* of .26). The same specific assessments do not do well in

FIGURE 3-14

ANALYSIS OF COMMUNITY ASSESSMENT: HYPOTHESIZED RELATIONSHIPS

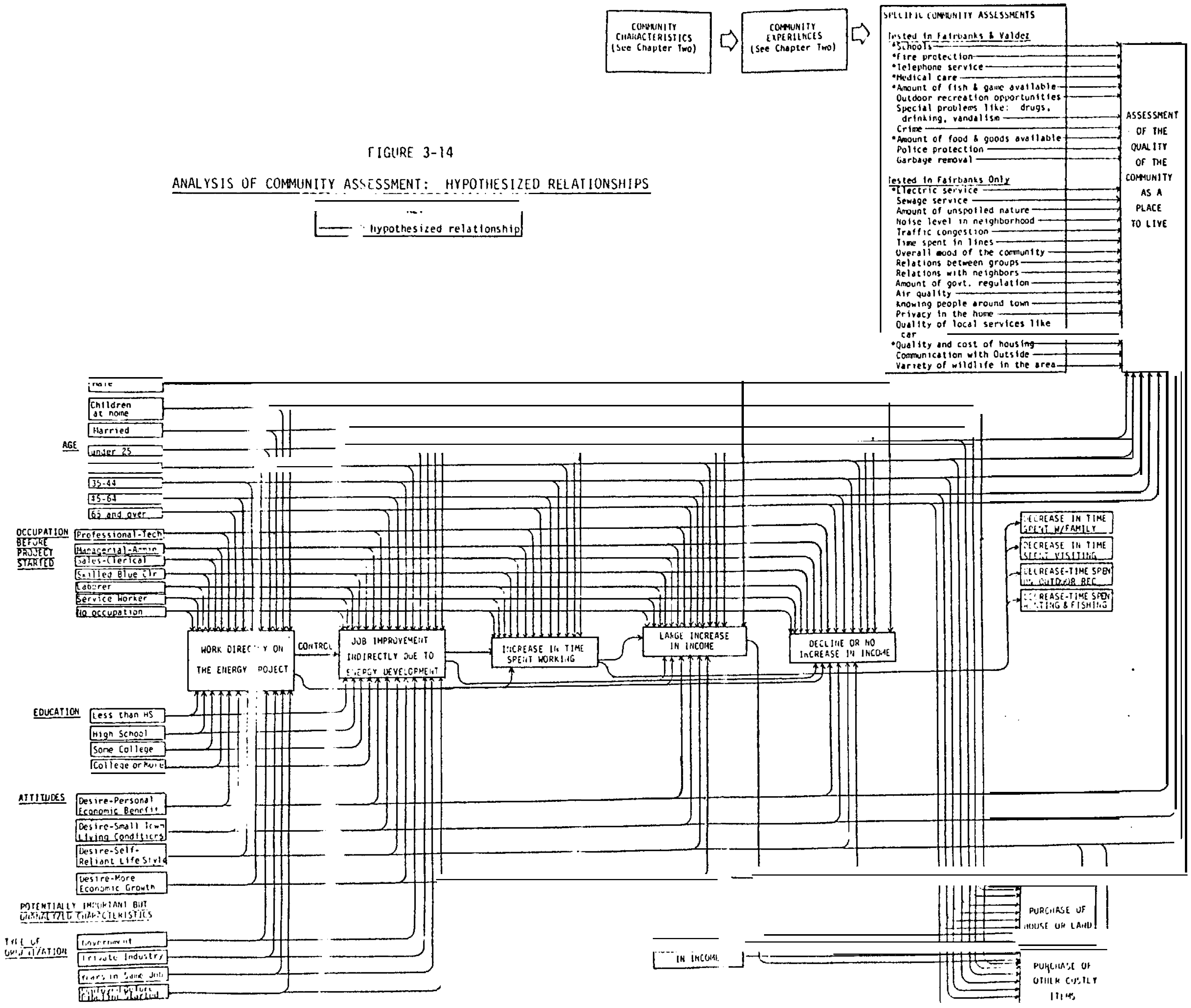


TABLE 3-18

RESULTS OF ANALYSIS OF CHANGES
IN THE PERCEIVED QUALITY OF THE COMMUNITY AS A PLACE TO LIVE

Tested in Fairbanks & Valdez	Fairbanks	Valdez	Assignment of Results
*Schools	+		
Fire protection	+		
*Telephone service	+		
● Medical care	+		
Amount of fish & game available	+		
Outdoor recreation opportunities	+		
Social problems like: drugs, drinking, vandalism	+	+	
Crime	+		
*Amount of food and goods available			
Police protection			
Garbage removal			
R^2	.26	.06	
Tested in Fairbanks Only			
● Electric service	+		
Sewage service	+		
Amount of unspoiled nature	+		
Noise level in neighborhood	+		
Traffic congestion	+		
Time spent in lines	+		
Overall need of the community	+		
Relations between groups	+		
Relations with neighbors	+		
Amount of government regulations			
Air quality			
Knowing people around town			
Privacy in the home			
Quality of local services like car repair			
*Quality and cost of housing			
Communication with outside			
Variety of wildlife in the area			
R^2	.43	not available	
Age			
Under 25	-0	-0	C
25-34	-0		C
35-44	0	-	N
45-64	+0	-0	N
65 years and over.	+	+0	C
Attitudes			
Desire for personal economic benefits	+	-0	I
Desire for small town living conditions	-	-0	C
Desire for a self-reliant life style	+0	+0	N
Oesire for more community growth	+	+	C
R^2	.48	.20	

Key:

Symbol	Meaning
+	significant positive
+0	non-significant positive
0	no relationship
-0	non-significant negative
	significant negative
R^2	percent of variation explained by all independent variables

Consistent Relationships	Inconsistent Relationships	Assignment of Results
+ and +	+ and -	C=Consistent
+ and +0	+ and -0	I=Inconsistent
- and -0	+ and 0	N=No relationship
- and -	- and 0	
	- and +0	

Valdez, combining to give an R^2 of only .06. Since the actual community changes may differ between the two communities, we are not concerned whether the same specific community assessments are significant in Valdez and Fairbanks. However, we are hoping to identify the specific community changes in each community that explain why people feel that the community has changed for the better or the worse. Our success in Fairbanks is not matched in Valdez.

Several reasons can be offered as possible explanations for the Valdez results. We may not have measured the specific community attributes which were important in Valdez. These important assessments might be included among the seventeen which were only measured in Fairbanks. But the addition of more specific community assessments probably would not help. The results in Fairbanks suggest that we should expect to find many significant assessments; it is unlikely that only one assessment in the eleven tested should be significant.

The more likely reasons for the poor Valdez results involve measurement problems. First, the analysis technique requires that we have a complete set of measures for every person in the sample.[15] Only fifty people meet this requirement in Valdez for the analysis of community assessments. Ideally, the analysis should be made with a sample of over 400 people. The Fairbanks sample of just over 200 for this analysis is stretching the limits of the technique; it is quite likely the Valdez sample is simply too small.

[15] This is somewhat of a simplification because small amounts of missing data are acceptable under some conditions. In general, however, the statement is true.

Another potential measurement problem may apply to the Valdez measures. Residents in both communities were not asked directly whether a specific community characteristic changed for the better, the worse or experienced no change; instead, residents rated each characteristic at two points in time: before the energy project began and during the peak of the energy project.[16] However, the ratings were made on a 9 point scale in Fairbanks and a 3 point scale in Valdez. The measures of change in both communities were constructed by subtracting the second assessment from the first. In this way, the Fairbanks change measures have seventeen possible response categories (-8 to +8) rather than the five (-2 to +2) as they do Valdez. The larger number of response categories is more sensitive to changes and may explain why the Fairbanks specific community assessments are better predictors of overall community change than the Valdez assessments. We recommend that future surveys should use the Fairbanks approach.

Returning to the results reported in Table 3-18, we find that our success in predicting how residents feel the community has changed as a whole is greatly improved by adding more specific community assessments (the R^2 increases from .26 to .43). Seventeen of the twenty-eight specific assessments tested in Fairbanks are significant predictors. The high R^2 suggests that a comprehensive list of specific community characteristics has been identified.[17] Since a different mix of community changes may

[16]Although not used in our analysis, residents in Fairbanks were also asked to rate each community characteristic as they expected it to be following the construction of the energy project.

[17]Most of the specific community characteristics were first tested in another research project. Thus credit for the comprehensive scope of the attributes should largely go to Lester Milbrath and his colleagues at the Social Science Research Center of the State University of New York at Buffalo. For a discussion of their research, see Milbrath, Lester and Robert Sahr, "Perceptions of Environmental Quality," Social Indicators Research 1 (1975): 397-438.

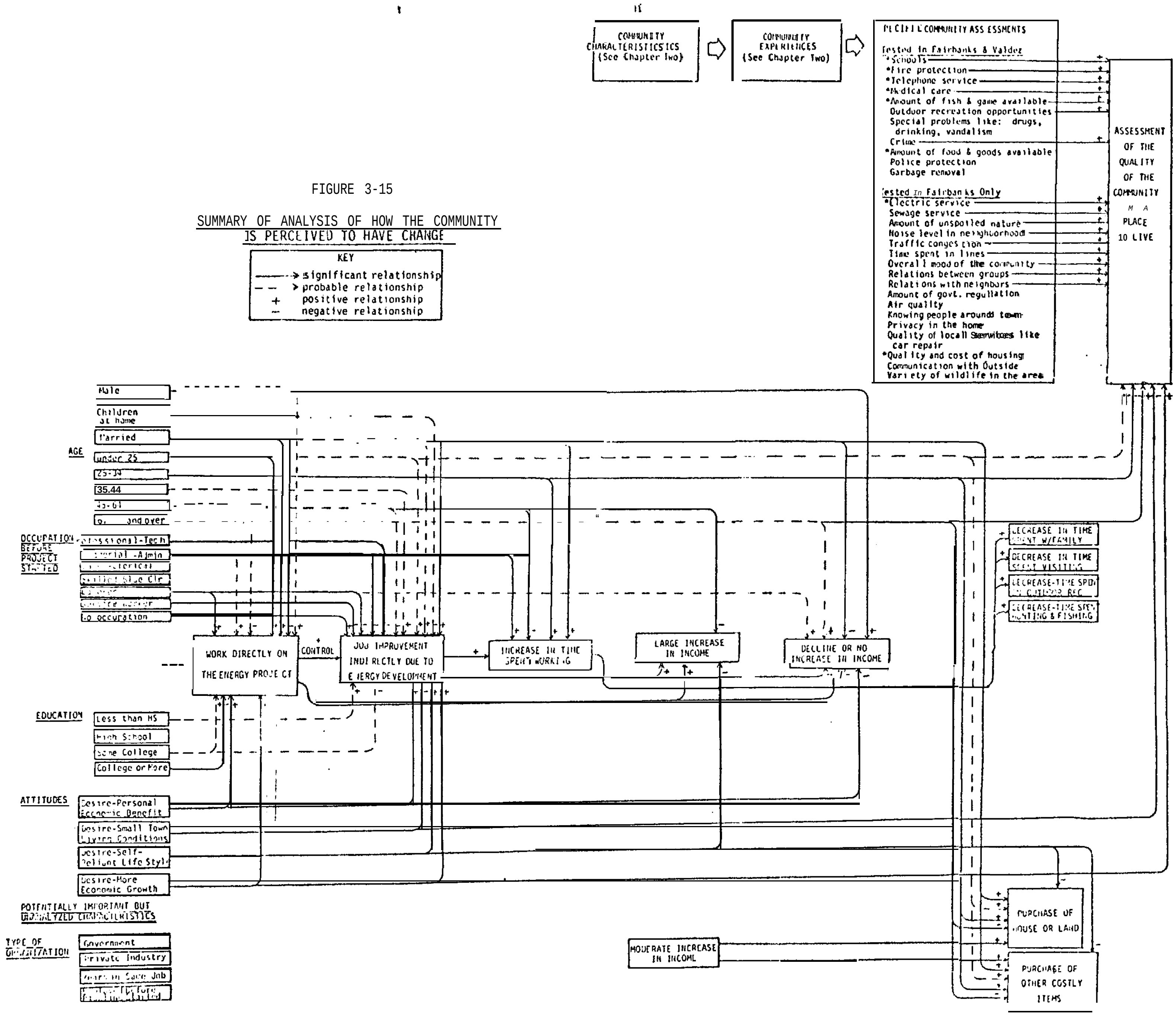
result in a new combination of significant specific community assessments, we recommend that most, if not all, of the assessments tested in Fairbanks be included in future research.

The age and attitude variables did not improve our predictive success in Fairbanks or Valdez a great deal but the relationships were generally the same in both communities. Older residents appear to generally take a more positive perspective toward community change as do residents who would like the community to grow. At the same time, residents who like to live in a small town environment take a dimmer view of the community changes occurring during a major energy project. The only apparent inconsistency is that Valdez residents who personally would like to improve their economic well-being do not show the expected rosy outlook on community change. The observed relationship is not significant, however, and we would not reject the hypothesis that personal economic motives will generally result in a more positive view of community change.

Figure 3-15 summarizes the analysis results. Clearly specific assessments of community change are important determinants of an overall assessment of community change. Further, the results suggest that most of the areas of community change subject to analysis in the Community Level Change component are important, at least in Fairbanks. The availability of housing was not included among the specific assessments so its importance could not be tested. The only area of change that was subject to detailed analysis in the Community Level Change component but does not appear as a significant community assessment is the quality of retail trade. However, the results also point out that many community changes that we were

FIGURE 3-15

SUMMARY OF ANALYSIS OF HOW THE COMMUNITY IS PERCEIVED TO HAVE CHANGE



not able to analyze in detail are significant. An important area for future research, then, is to identify community characteristics which influence these significant community changes.

COMPARISON OF OVERALL COMMUNITY ASSESSMENTS OF CHANGE BETWEEN RESIDENTS AND IMMIGRANTS

If new residents react differently than existing residents to current community changes, then they may press for different future changes as well. For this reason, it is important to know if both groups perceive community changes in the same way. The results of our analysis of individual differences reported above suggest that specific assessments of change are more important than personal characteristics in predicting overall assessments of community change. We might expect, then, that known differences in the personal characteristics of existing and new residents should not be important. On the other hand, personal characteristics may influence specific community assessments and thus indirectly affect overall community assessments.

A comparison of overall community assessments of change in Fairbanks shows that new residents view change somewhat less negatively than existing residents (see Table 3-19). This difference is in the direction we would expect if personal characteristics actually do affect overall assessments. New residents are more strongly oriented toward personal economic benefits and less strongly oriented toward a small town living environment (see Table 3-20). Thus, it would appear that the personal characteristics of new residents in Fairbanks may directly or indirectly color perceptions of overall community change.

TABLE 3-19

COMPARISON OF OVERALL COMMUNITY ASSESSMENTS
OF CHANGE BETWEEN EXISTING AND NEW RESIDENTS
(percent distributions)

Overall Community Assessment of Change	Fairbanks Residents	Fairbanks Immigrants	Fairbanks Total	Valdez Residents	Valdez Immigrants	Valdez Total
Much worse now	40	25	34	*	*	*
Worse now	38	40	39	14	23	19
Little or no change	22	34	27	69	55	60
Better now	-	1	-	17	22	21
	100	100	100	100	100	100
Number of Respondents:	231	159	390	90	134	224

*Valdez assessments use a three "point scale as compared to a four point {reduced from seventeen) in Fairbanks.

TABLE 3-20

COMPARISON OF ATTITUDES
BETWEEN RESIDENTS AND IMMIGRANTS
(percent distributions)

Attitude Toward Personal Economic Benefits	Fairbanks Residents	Fairbanks Immigrants	Fairbanks Total	Valdez Residents	Valdez Immigrants	Valdez Total
Extremely important	11	22	16	18	29	27
Very important	22	26	24	*		
Moderately important	19	22	20	56	48	51
Not very important	20	18	19			
Not at all important	28	12	21	26	23	22
	100	100	100	100	100	100
ttitude Toward Living in Small Community						
Extremely important	9	4	6	28	31	30
Very Important	34	12	25			
Moderately important	17	19	18	66	67	67
Not very important	15	24	19			
Not at all important	25	41	32	6	2	3
	100	100	100	100	100	100
Number of Respondents:	137	167	408	208	73	211

*Valdez responses were measured on a three rather than five point scale.

New Valdez residents do not show the same pattern (see Table 3-19). While they too are slightly more likely to believe Valdez has changed for the better, they are also more likely to believe Valdez has changed for the worse. The explanation for the difference between the two communities may again involve the personal characteristics of the new reisdents. In Fairbanks, less than half as many new residents as existing residents (16 percent versus 43 percent) feel that a small town living environment is important. However, about equal proportions of existing and new residents in Valdez (28 and 30 percent, respectively) feel the same way. Therefore, many new as well as existing residents in Valdez may feel a loss in small town values and hence be as likely to perceive that the community has changed for the worse. This still does not answer why new residents in Valdez may be <u>more</u> likely to believe that the community has changed for the worse. Perhaps Valdez did not fit the expectations of new residents who were used to facilities found in larger communities while existing residents were more attuned to the higher level of economic activity in the community and less sensitive to the prevalent disruptions.

The above comparisons of assessments and attitudes between new and existing residents raises an important point: new residents may differ as a group in the same way that the residents of two communities can differ. This means that new residents cannot be viewed as a consistent outside force for change. Of course, such differences complicate the prediction of community changes, but it appears that they should not be ignored in future research efforts.

Change in Personal Satisfaction

CHANGES AMONG EXISTING RESIDENTS

The impacts of development projects on the lives of individual community residents are usually measured in terms of objective changes. Our research departs from this tradition. Instead, subjective self assessments of personal satisfaction are used; namely, does an individual believe he or she is bearing the costs or receiving the benefits from the development that is taking place? Personal assessments are hypothesized to mainly depend on personal experiences during the impact situation. Changes in employment and income are consequently expected to influence personal satisfaction. However, more specific development experiences are also expected to affect this assessment; these include changes in the amount of time spent with the family, working, or participating in subsistence activities. In addition, personal satisfaction may depend on assessments of how the community has changed as a place to live.

Predevelopment personal characteristics are also hypothesized to affect levels of satisfaction. To some extent these relationships may be indirect since we have already shown that personal characteristics affect the impact experiences of residents. However, assessments may also be directly influenced by personal characteristics themselves; residents of different ages or having different initial attitudes toward development may riot assess the same experiences equally.

Thus, three sets of independent variables were used for predicting levels of personal satisfaction: personal impact experiences, changes in perception of how good the community is seen as a place to live and predevelopment personal characteristics (see Figure 3-16). The independent variables include:

Personal Experiences

- direct employment on the energy project
- having a better job as an indirect result of the energy project
- increase in time spent working
- decrease in time spent with the family
- decrease in time spent in leisure and outdoor recreation
- decrease in time spent in social relations
- decrease in time spent in subsistence activities
- changes in family income
- changes in housing and housing satisfaction
- purchase of major consumer goods

Assessment of Community Change

- change in perception of the community as a good place to live

Predevelopment Personal Characteristics

- desire for more community growth

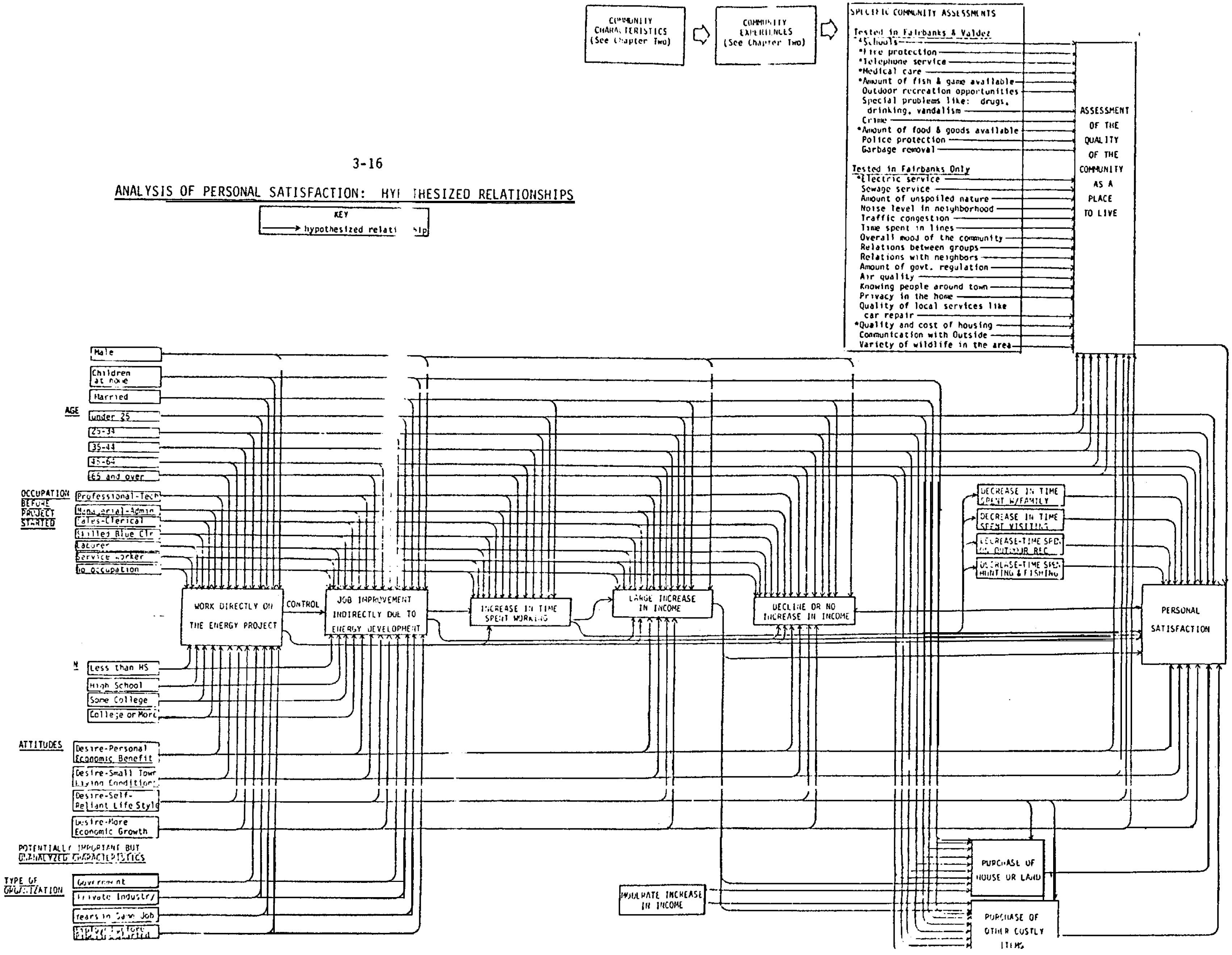
- desire for personal economic benefits
- desire for small town living environment
- desire to lead a self-reliant life style
- age

Data on all these variables was available from the Fairbanks survey. The Valdez and Fairbanks measures of decreases in time spent in social relations differ in that the Valdez measure pertains to participation in formal organizations and the Fairbanks measure is of time spent visiting. Variables that were not included in the Valdez analysis were having a better job as a result of the development, changes in time spent working and the purchase of major consumer goods. Changes in time spent on subsistence activities was measured in Valdez through a combination of hunting and fishing frequency and the proportion of food supply provided by subsistence. Finally, housing changes in Valdez were only measured indirectly through an assessment of satisfaction with the present condition of housing during the period of study. In Fairbanks, this was measured through purchase of a new house.

The most important difference between the variables used in the Fairbanks and Valdez analyses of personal satisfaction is in the way personal satisfaction itself is measured. The Fairbanks survey included a question which directly measured personal satisfaction in the context of the energy development.[18] No comparable question was included in the Valdez

[18] The question read, "Would you say your situation is more like that of people who are receiving most of the benefits of pipeline impact or is your situation more like that of people who are bearing most of the costs of pipeline impact?"

ANALYSIS OF PERSONAL SATISFACTION: HYPOTHESIZED RELATIONSHIPS



survey. Instead, the personal satisfaction measure had to be constructed from responses to an open question about the changing character of Alaska as a whole.[19] While the Fairbanks and Valdez measures of personal satisfaction are similar, the Valdez measure is clearly a mixture of both personal and community satisfaction.

The importance of measurement differences is immediately apparent in the results displayed in Table 3-21. Direct and indirect employment are the most important predictors of personal satisfaction in Fairbanks while direct employment proved to be only a weak predictor in Valdez (indirect employment was not measured). In view of the way in which the personal satisfaction measure was constructed in Valdez, the result is not surprising. The important points are that direct employment is a significant predictor in both communities and that the Fairbanks results suggest that both direct and indirect employment are the two most important predictors.

Beyond energy-related employment, time use and material changes explain some but not much additional variation in personal satisfaction. Remember that energy-related employment and time use changes are related by changes in the time devoted to work. If we were to ignore employment experiences, in fact, we would find that decreases in the time spent on non-work activities are associated with higher levels of personal satisfaction. For most residents, the personal economic benefits of energy-related

[19]The question read, "Some people in Alaska today say that the old Alaska is changing and they fear that the qualities that made them love Alaska are being lost. Others seem to feel that Alaska is changing for the better or that the changes are being exaggerated. How do you feel about living in Alaska this year?" Responses were coded in several ways but the coding used in the measure of personal satisfaction was: (1) opposed to change, (2) opposed but resigned to change and (3) supportive of changes.

TABLE 3-21.

RESULTS OF ANALYSIS OF PERSONAL SATISFACTION

	Fairbanks	Valdez	Assignment of Results
Work Experience			
Direct employment on pipeline	+	+	C
Improved job as result of pipeline	+	not available	C
R^2	.22	.03	
Time Use Changes			
Increase time spent working	0	not available	N
Decrease in family time	0	'	I
Decrease in leisure time	0	0	N
Decrease in social relations	0		I
Decrease in subsistence	+	+	C
R'	.24	.11	
Material Changes			
Increase in income	+	+0	C
Decrease in income	0	0	N
Purchase of major goods	0	not available	N
Purchase of housing/ housing satisfaction	0	0	N
R^2	.26	.12	
Community Changes			
How good the community is seen as a place to live	+	+	C
$R^?$	.29	.35	
Predevelopment Personal Characteristics			
Age: under 25	0		I
25-34	0	-0	N
35-44	-0	0	N
45-64	0	0	N
over 65	0	+	I
Desires personal economic benefits	+	0	I
Desires small town living conditions	0	-	I
Desires self-reliant life style	+	0	1
Attitude to community growth	+	0	I
R^2	.32	.38	

Key:

Symbol	Meaning
+	significant positive
+0	non-significant positive
0	no relationship
-0	non-significant negative
.	significant negative
R^2	percent of variation explained by all independent variables

Consistent Relationships	Inconsistent Relationships	Assignment of Results
+ and +	+ and -	C=Consistent
+ and +0	+ and -0	I=Inconsistent
- and -0	+ and 0	N=No relationship
- and -	- and 0	
	. and +0	

employment outweigh the personal social costs. Once the effects of energy-related employment are statistically removed, we find some evidence that decreases in time spent with family and participation in organizations does lower personal satisfaction in Valdez. No relationship is observed for either of these variables in Fairbanks.

The positive relationship between decreased time in subsistence and increased personal satisfaction presents an interesting exception. Why should someone feel he is benefiting from an energy project if he is spending less time on subsistence? Is subsistence something people would prefer not to do? Perhaps a decrease in the time spent on subsistence does not necessarily mean that the subsistence harvested is reduced; residents may have more money to buy equipment, thus increasing their efficiency. The relationship between the time spent in subsistence and personal satisfaction is not strong, but the fact that it contradicts our expectations suggests that we should continue to test it in future research efforts.

Referring back to Table 3-21, we find that material changes do not contribute greatly to the prediction of personal satisfaction beyond that already explained by employment experiences.

The results from the two case study communities diverge with regard to community changes. While significant positive relationships can be observed for both communities, community assessments appear to be much more important in Valdez. We believe that this is probably due to the particular measure used in Valdez and does not mean that Valdez residents are more concerned with community changes than Fairbanks residents.

Finally, the influences of personal characteristics on personal satisfaction are weak in both communities. Of course, we have previously shown that the same personal characteristics are important predictors of the experiences which do influence personal satisfaction. The large number of significant relationships observed between the work experience time use, income and community change variables and personal satisfaction make it unlikely that the same personal characteristics will be a significant predictor in both communities.

Briefly, age shows no significant relationships to personal satisfaction in Fairbanks. The Valdez results for age parallel those observed in the analysis of community assessments. Given the similarity of the community assessment and personal satisfaction measures, this is not surprising. The attitude measures, when significant, are consistent with the results reported for previous analyses so need not be further discussed here. A cumulative summary of the twelve analyses results reported thus far is provided in Figure 3-17.

COMPARISON OF PERSONAL SATISFACTION BETWEEN RESIDENTS AND IMMIGRANTS

In our analysis of existing residents, economic conditions were found to be of greatest importance in defining personal satisfaction. Since most immigrants moved to Fairbanks and Valdez in order to economically benefit from the energy project, they should have higher levels of personal satisfaction. : This is evident from Table 3-22 which compares levels of personal satisfaction for residents and immigrants. In both Fairbanks and Valdez immigrants are more likely than residents to believe they are receiving the benefits of the energy project. Care should be taken in reading the

FIGURE 3-17

SUMMARY OF RESULTS OF ANALYSIS OF PERSONAL SATISFACTION

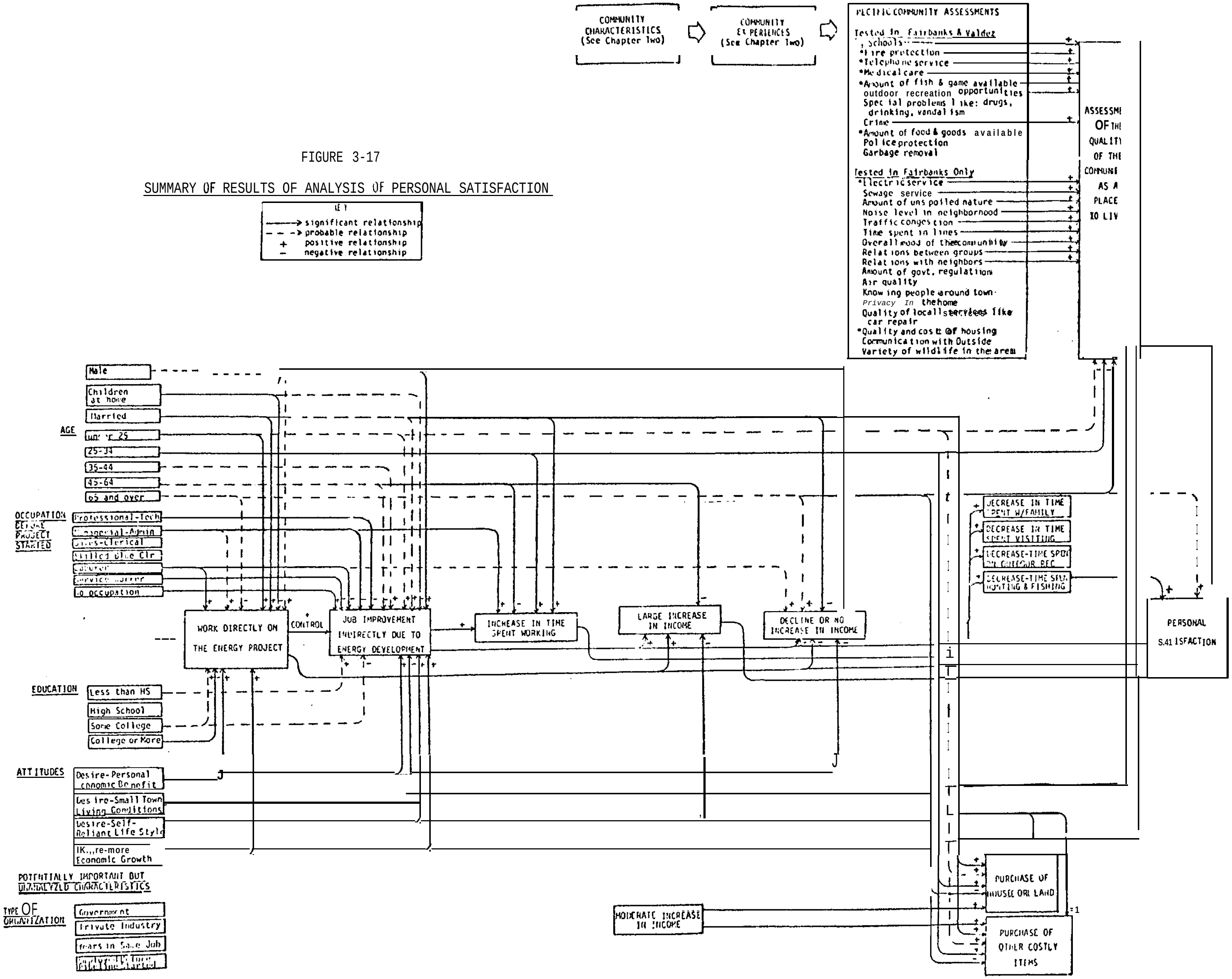


table to not make direct comparisons between Fairbanks and Valdez. Although it would appear from the table that Fairbanks residents perceived relatively greater costs in terms of personal satisfaction than in Valdez, this may be in part due to different measures used for assessing the variable in the two communities.

TABLE 3-22

COMPARISON OF PERSONAL SATISFACTION BETWEEN RESIDENTS AND IMMIGRANTS
(percent distributions)

Personal Satisfaction	Fairbanks Residents	Fairbanks Immigrants	Fairbanks Total	Valdez Residents	Valdez -rants	Valdez Total
Bear costs of development	55	34	47	24	24	24
Mixed	28	29	28	32	22	24
Receive benefits of development	17	37	25	44	54	52
	100	100	100	100	100	100
Number of Respondents:	239	166	405	88	124	212

The observed result that immigrants are more likely than residents to believe that they are receiving the benefits of energy development is not surprising. What is surprising is that more Valdez immigrants than residents also believe that they are bearing the costs of development. The Valdez analysis of community assessments showed similar results; immigrants were more likely than residents to believe Valdez has changed for the worse. The same explanation given in the case of community assessments may apply to the analysis of personal satisfaction. Some immigrants to Valdez appear to be more sensitive than their resident counterparts to the decline in the small town character of Valdez (see Table 3-19). Our analysis of the causes of personal satisfaction shows that community assessments do play a role. Consistent with the results, it seems that the negative community assessments of some Valdez immigrants are applied to personal satisfaction. Despite this wrinkle in the Valdez results, the net effect of in-migration in both case study communities is to increase the proportion of all community residents who are personally satisfied with the energy project. Even with the addition of immigrants, however, only a quarter of each community believes they are not bearing at least some of the costs of the energy project.

Change in Attitude Toward Growth and Development

ANALYSIS OF CHANGES AMONG EXISTING RESIDENTS

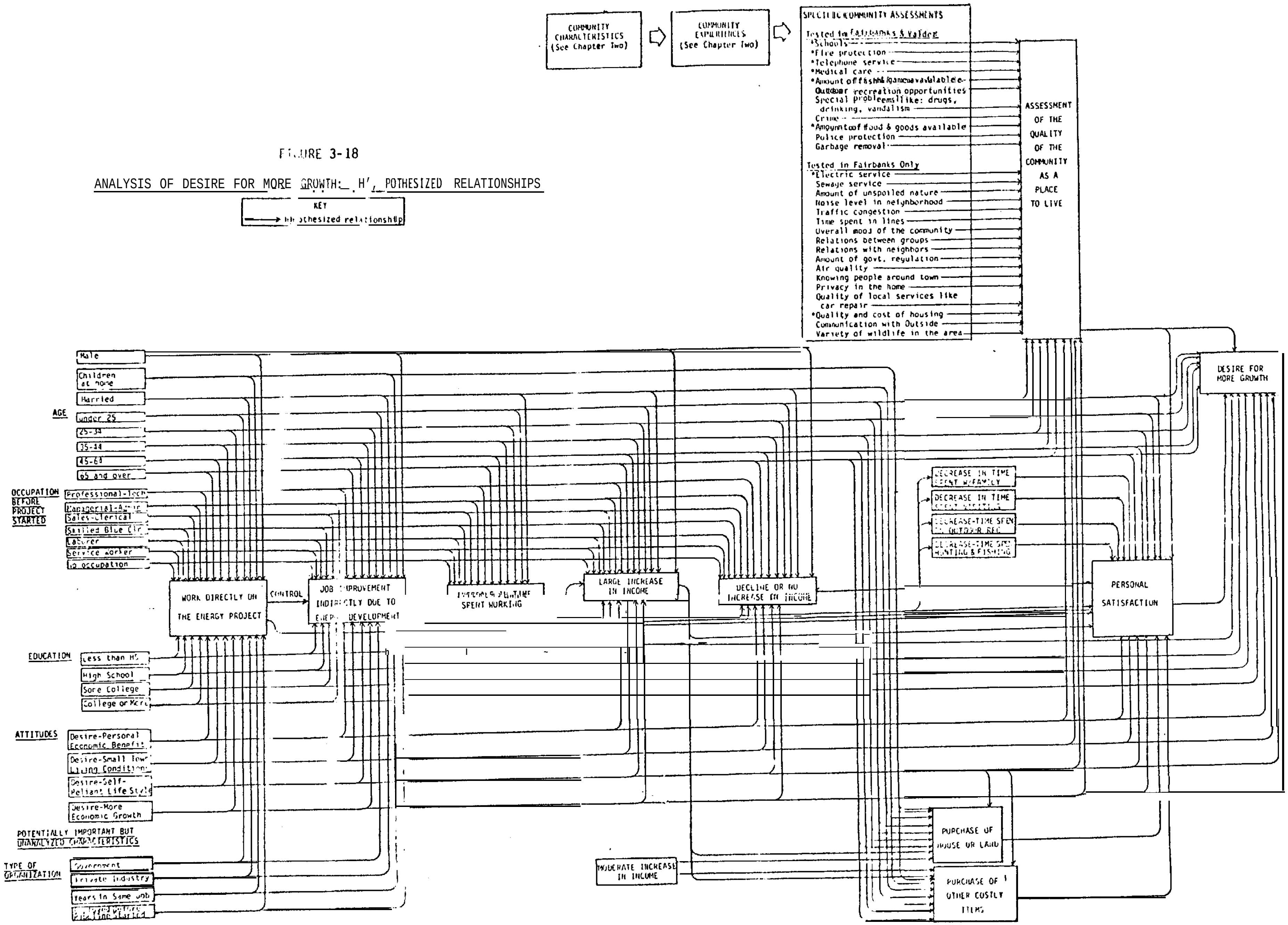
Generally, a person's attitudes toward community growth and development do not change rapidly. In fact, most people do not change their attitudes at all over a period of several years. A major development, however, is an unusual event that may cause some people to change their minds. Public attitudes toward community growth and development are important because business and political decisions may be swayed by them. If a major development tends to shift attitudes for or against growth, the actual course of community growth and development may be changed as well.

The purpose of our analysis is to see how the major personal experiences and assessments combine with personal characteristics to predict an individual's attitude toward growth. Each person's initial attitude toward growth is included as a basis for comparison. Figure 3-18 shows the variables in the analysis along with the variables entered in all previous analyses.

The analysis results are displayed in Table 3-23. As expected, predevelopment

FIGURE 3-18

ANALYSIS OF DESIRE FOR MORE GROWTH: HYPOTHESIZED RELATIONSHIPS



attitudes toward growth are positively related to peak development attitudes in both case study communities. It appears that predevelopment growth attitudes are substantially more important in Fairbanks (R^2 of .36 in Fairbanks vs. .09 in Valdez). However, the difference probably does not mean that Valdez residents are more likely to change their attitudes toward growth as a result of experiences with the energy development. Age, education, and other predevelopment attitudes strongly influence peak development attitudes in Valdez but exert relatively weak influences in Fairbanks. When predevelopment attitudes toward growth are combined with these variables in both communities, the level of predictive success is about the same (R^2 values of .43 and .40 in Fairbanks and Valdez, respectively). These results suggest that a better measure of predevelopment attitudes in Valdez would perform similarly to the Fairbanks measure. In addition, predevelopment attitudes in Valdez were collected approximately one month before actual construction on the pipeline was initiated. and considerable apprehension concerning immediate community impact may have tended to distort original attitudes.

The results in both communities indicate that development experiences change attitudes toward growth but only to a small extent (see Table 3-23). It is unclear whether assessments of community-wide or personal experiences are more important; the Fairbanks results point to the former and the Valdez results indicate the latter is more important. The cumulative results of all analyses thus far discussed are presented in Figure 3-19.

TABLE 3-23

~~SUMMARY OF ANALYSIS OF FINAL ATTITUDE TOWARDS GROWTH~~

	Fairbanks	Valdez	Assignment of Results
Initial attitude towards growth	+	+	C
R^2	.36	.09	
Age			
Under 25	-0	-0	C
25-34	0	.	N
35-44	0	+0	N
45-64	+0	+0	C
65 years and over	0	+	N
Education			
Less than high school	+	-0	I
High school	0	0	N
Some college	-0	-0	C
College or more	-	+	I
Attitudes			
Desire for personal economic benefits	+	+	C
Desire for small town living conditions	-	0	I
Desire for a self-reliant life style	-	-	C
R^2	.43	.40	
Assessments			
Perception that community has changed for the better	+	0	I
Perception that person is receiving benefits of energy project	+0	+	C
R^2	.46	.42	

Key:

Symbol	Meaning
+	significant positive
+0	non-significant positive
0	no relationship
-0	non-significant negative
	significant negative
R^2	percent of variation explained by all independent variables

Consistent Relationships	Inconsistent Relationships	Assignment of Results
+ and +	+ and -	C=Consistent
+ and +0	+ and -0	I=Inconsistent
· and -0	+ and 0	N=No relationshi
- and -	and 0	
	- and +0	

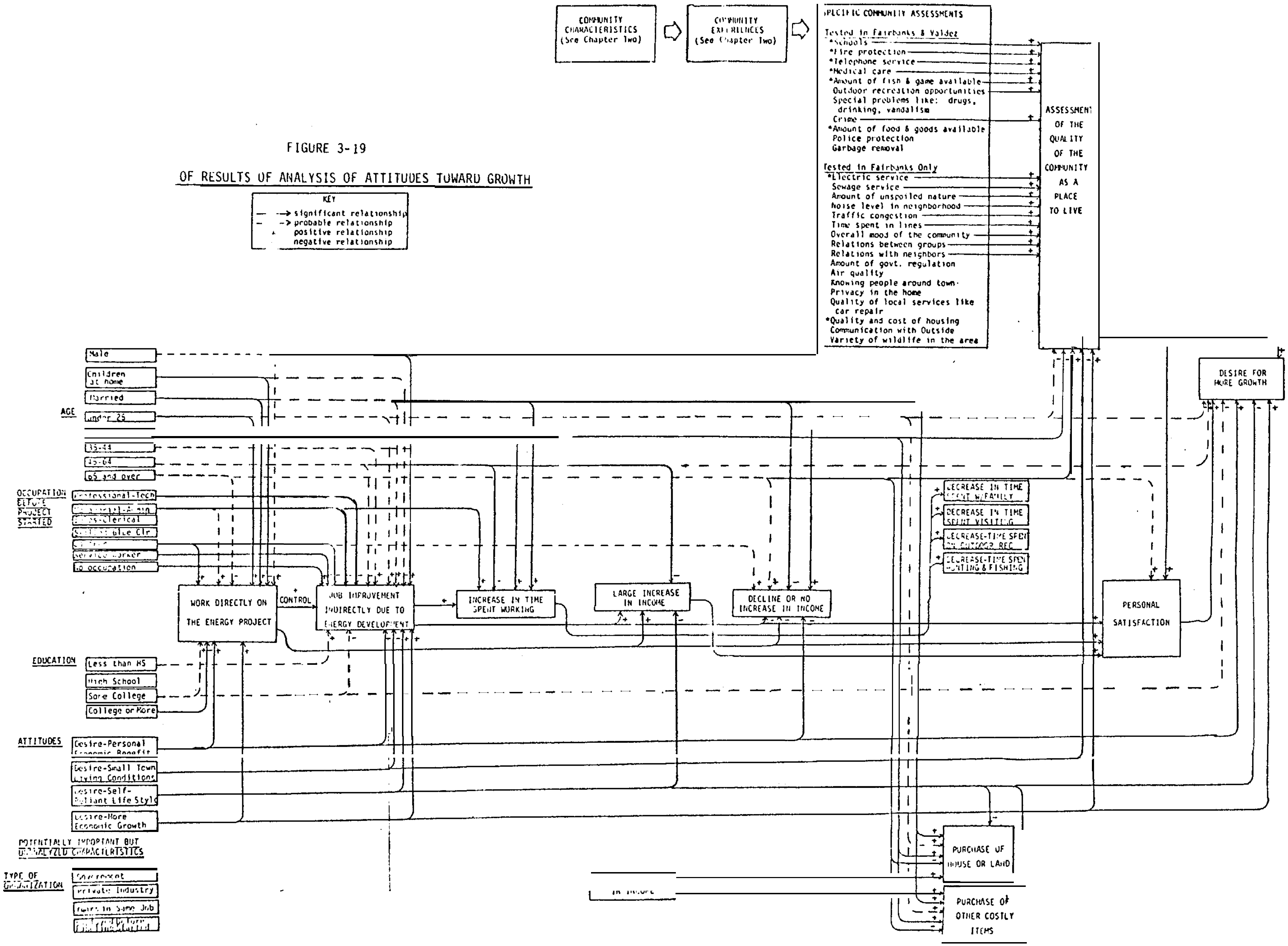


FIGURE 3-19

OF RESULTS OF ANALYSIS OF ATTITUDES TOWARD GROWTH

COMPARISON OF PEAK DEVELOPMENT ATTITUDES TOWARD GROWTH BETWEEN RESIDENTS AND IMMIGRANTS

Some persons who move into a community because of a major development may remain in the community and add their own voice to the community. Their attitudes toward growth and development may tend to differ from the attitudes of longer term residents. Thus, a major energy development can set into motion a potentially different incentive for or against growth in two ways. Existing residents may change their minds because of the benefits or costs they experience. At the same time, new residents may contribute a different point of view.

New residents in Fairbanks more strongly favor growth than existing residents (see Table 3-24). This is true even when we only look at the attitudes of new residents who plan to stay in the community after the energy project is over. These results suggest that, in Fairbanks at least, the attitudes of new residents do act as an outside force for change by increasing public demands for community growth. The attitudes of new residents in Valdez do not appear to differ from those of existing residents. The attitude measures are different in Fairbanks and Valdez so it is difficult to say whether new residents in the two communities have a similar mix of attitudes toward growth. Our best estimate is that new residents in Fairbanks and Valdez generally share the same mix of attitudes. New residents in Valdez do not increase the demand for community growth because their attitudes closely match the strong growth orientation of the existing residents in Valdez.

TABLE 3-24

COMPARISON OF PEAK DEVELOPMENT ATTITUDES TOWARD GROWTH BETWEEN RESIDENTS AND IMMIGRANTS
(percent distributions)

Peak Development Attitude Toward Growth	Fairbanks Residents	Fairbanks Immigrants	Fairbanks Total	Valdez Residents	Valdez Immigrants	Valdez Total
Strongly favor	11	16	13	6	13	14
	22	35	27	39	37	38
Mixed	34	26	31	28	26	27
	22	17	20	17	24	21
Oppose	11	6	9			
	100	100	100	100	100	100
Number of Respondents:	240	168	408	90	134	224

Peak Development Attitude Toward Growth	Fairbanks New Residents Who Plan to Stay	Valdez New Residents Who Plan to Stay
Strongly favor	17	18
	34	32
Mixed	27	28
	17	22
Oppose	5	
	100	100
Number of Respondents:	100	50

The Fairbanks and Valdez results serve to raise the important point that we cannot simply view outside forces for change in absolute terms. We must also compare the characteristics of new residents and existing residents in order to determine whether a community is, in fact, subject to an outside force for change. Our analysis of attitudes toward growth suggests that it should not be difficult to decide if new residents will change public demands for growth. First, the analysis results indicate that the attitudes of existing residents toward growth will not change greatly during the energy project; predevelopment attitudes are relatively stable. Second, the mix of growth attitudes among new residents appears to be consistent across communities. Therefore, it should be possible to compare predevelopment attitudes of existing residents with our observations of the attitudes of new residents. A potentially significant outside force for change will be identified if the distributions of growth attitudes in the two groups differ.

Plans to Move from the Community

ANALYSIS OF CHANGE AMONG EXISTING RESIDENTS

The final area of change addressed at the individual level is whether a person plans to move from the community when the development construction period is over. The reasons why a person might leave a community probably vary over time. When a major energy development is announced, residents who oppose it may tend to leave. During the peak of development activity, those who cannot afford the high prices and those who dislike the changes may also leave. In contrast, some who came specifically because of the development may leave when the construction period and work is over, while others may stay on as permanent residents. Older residents who opposed the development or dislike the development experience may expect things to get better and thus choose to stay.

Our analysis of moving plans applies primarily to the post-construction period but is based on a measure made during the construction period. It may understate opposition to the development as a reason for moving because we do not know who may have left before the development started. On the other hand, development causes permanent as well as temporary changes in the community and moves may in part reflect a desire to move somewhere that has not grown quite so fast. In addition, our question about moving plans was asked during the peak of construction when frustrations may have been highest for some residents. Their answers may well reflect their reaction to the peak rather than the post-construction period.

Since the reasons for moving may change over time and we cannot compare their importance at different points, the purpose of our analysis is not to determine which reasons are generally most important. Instead, the analysis tests whether a number of potential reasons for moving are, in fact, real reasons for moving. We are particularly interested if negative development experiences are a cause for moving. If they are, then moves from a community may be significant cost of an energy development.

As the final variable in our analysis, migration plans were hypothesized to depend on a considerable number of factors. These included not only the personal characteristics of the resident, but also their experiences during the impact period and their assessments derived from these experiences. Two new characteristics were added to the personal characteristics that have been entered in previous analyses. The first measures the extent of friendships and family ties within the community. The second measures the same friendship and family ties in places away from the local community.

Taken together then, all the independent variables used to predict migration plans are:

Personal Assessments

- how good the community is seen as a place to live

- personal satisfaction

- attitudes toward more community growth and development

Personal Experiences

- direct employment on energy project

Personal Characteristics

- marital status

- age

- desire for more personal economic benefits

- desire for small town living conditions

- desire for self-reliant life style

- personal friendships and social ties in the local community (Fairbanks and Valdez)

- personal friendships and social ties outside the local community (away from Fairbanks and Valdez)

These relationships are diagramed in Figure 3-20. The results of the analysis are presented in Table 3-25. All the variables combined predict 15 percent of the variance in migration plans for Fairbanks residents. In Valdez, the R^2 value is somewhat higher at .22.

The similarity in results obtained between Fairbanks and Valdez are striking given the anticipated differences one would expect to find in their migration patterns. As seen in Table 3-26, a somewhat larger proportion of Valdez residents anticipate leaving their community than in Fairbanks. In the latter, a strong majority of 65 percent anticipate residing permanently in Fairbanks. Two potential factors may explain this difference. The first might be attributed to effects of impact and the energy project itself. This will be discussed in greater detail later. The second may be due to factors of size and historical patterns. As a small community with a limited economic base, Valdez has traditionally been a source of out migration. This migration normally occurs to the larger Alaskan urban centers. Although it is most pronounced between the ages of 18 and about 25, it is common at all age levels, even the elderly. In this regard, Valdez is probably similar to many other small and potential OCS site coastal communities.

Fairbanks, in contrast, is a regional center that tends to attract both long term residents from outlying areas and smaller communities and also attract a highly mobile population that only stays for a year or two. Since our analysis is restricted to people who have lived in the community three years or more, most of this mobile population is excluded. Consequently, one expects and finds that only a small number of Fairbanks residents included in our analysis sample have plans to move from the community.

Because of this community difference, one would not anticipate much consistency in the prediction of migration plans between the two communities. Such is not the case. Although important differences exist, the results seen in Table 3-25 show that residents are more likely to plan to leave both communities shortly if they:

FIGURE 3-20

ANALYSIS OF PLANS TO MOVE FROM THE COMMUNITY: HYPOTHESIZED RELATIONSHIPS

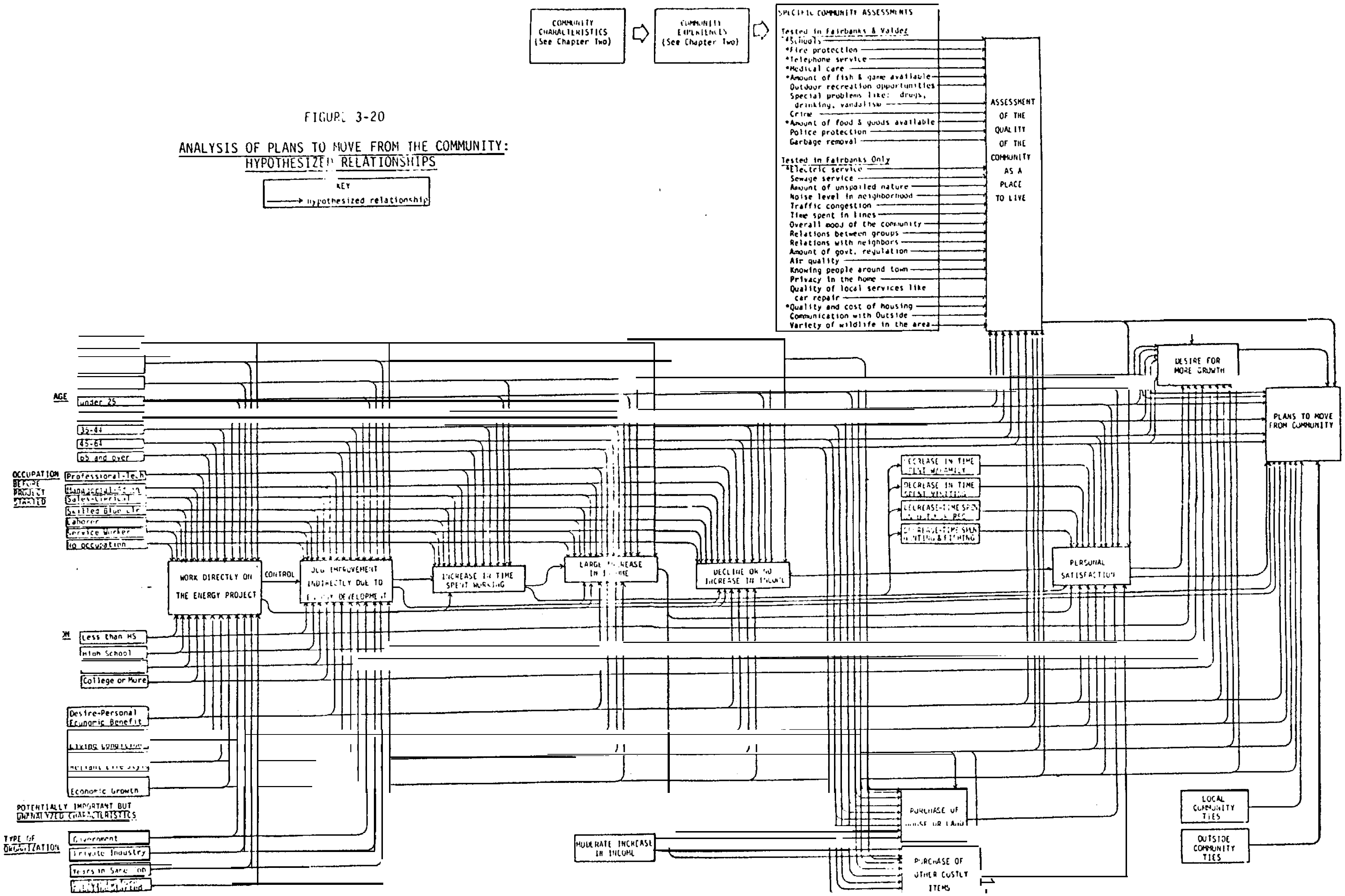


TABLE 3-25

RESULTS OF ANALYSIS OF PLANS TO MOVE FROM THE COMMUNITY

	Fairbanks	Valdez	Assignment of Results
Assessments-			
Community seen as a good place to live		·	C
Personal satisfaction	0	0	N
Desires more community growth and development	0	0	N
R^2	.01	.03	
Experiences			
Direct employment on energy project	+	0	I
R^2	.02	.04	
Personal Characteristics			
Married	-	+	I
Age: under 25	0	+0	N
25-34	0	0	N
35-44	0	0	N
45-64	0	0	N
65 years or more	-	-0	C
Attitudes			
Desires more personal economic benefits	+	+	C
Desires small town living conditions	-		C
Desires self-relaint life style	+	0	I
Local community personal ties	-	0	I
Outside community personal ties	0	+	I
R^2	.15	.22	

Key:

Symbol	Meaning
+	significant positive
+0	non-significant positive
0	no relationship
-0	non-significant negative
·	significant negative
R^2	percent of variation explained by all independent variables

Consistent Relationships	Inconsistent Relationships	Assignment of Results
+ and +	+ and .	C=Consistent
+ and +0	+ and -0	I=Inconsistent
- and -0	+ and 0	N=No relationship
- and -	- and 0	
	- and +0	

TABLE 3-26

PLANS TO MIGRATE FROM FAIRBANKS AND VALDEZ BY RESIDENTS WHO HAVE LIVED IN THE COMMUNITY AT LEAST THREE YEARS

(percent distributions)

Plans to Migrate	Fairbanks	Valdez
within 1 year	7	3
within 1 to 3 years	8	19
sometime after 4 years	20	29
never	65	T%-
	100	
Number of Respondents:	240	209

- do not see the community as a good place to live
- are not over age 65
- desire more personal economic benefits
- do not desire a small town living environment
- either do not have extensive local community social ties or do not have ties to outside communities

The explanations for these consistent relationships are relatively evident. To the degree that residents perceive their community as being positively or negatively effected by the energy project, so will it effect (although weakly) their migration plans. If they assess the changes as positive, they are more likely to stay, and vice versa. To this extent, the impact of a development project does have a direct bearing on the future lives of community residents.

Among the personal characteristics there were also consistencies. Residents under age 25 are generally more likely to migrate, even though neither relationship is significant and it is relatively strong only in the case of Valdez. Conversely those over age 65 were less likely to migrate. This relationship is stronger and only significant in Fairbanks, which one would expect due to the availability of programs for the elderly and superior medical services. Similarly, residents who want more personal economic benefits are more likely to migrate from both communities. Financial benefits that could be obtained from the energy project may be perceived as temporary. In contrast, residents who want to live in a small town are less likely to plan to move. In spite of differences in size of the case study communities, residents of both apparently feel that the small town values will best be realized by staying in their community. Possibly this represents an assumption that following completion of the project their community will return to its pre-impact social environment. That certain changes are cumulative and permanent may not be recognized in this assessment, particularly when viewed at the height of the impact period. Finally, and as one would anticipate, social ties exert an influence on migration. The fact that these appear to operate differently in the two communities, with local ties discouraging migration in Fairbanks and external ties encouraging it is Valdez, will be discussed later. In any case, family and social relationships constitute an important reason for determining migration patterns.

Differences in the outside forces for change may explain why Fairbanks residents directly employed on the energy project are more likely to plan to move from the community while their Valdez counterparts are not.[20] Employment opportunities related to the energy project in Fairbanks are largely limited to the construction phase. The pipeline terminal facilities in Valdez, on the other hand, as well as possible spinoff industries, provide long term employment opportunities. The effect of energy project employment on resident migration plans in both communities, however, is negligible.

Personal characteristics are the best predictors of migration plans in

[20]The pattern among immigrants in both communities is the same; employment on the energy project shows a strong, positive relationship to plans to move from the community following the energy project construction phase.

the case study communities but they do not show consistent results in all cases. Marriage, for example, is positively related to plans to move from Valdez and negatively related in Fairbanks. The added financial responsibilities of marriage coupled with limited local job opportunities (aside from those on the energy project) appears to provide a traditional incentive to migrate from Valdez.[21] In contrast Fairbanks would be expected to, and does, follow the more conventional urban pattern of having a more mobile single population.

The apparent inconsistency in local versus outside ties is best explained by the differential migration of small towns as compared to large. In small communities such as Valdez, local social and family ties tend to be pervasive among longer term residents. Therefore, the major distinguishing characteristic is the strength of outside ties. The converse would be expected in larger communities, as the Fairbanks data indicates. Finally, desire for a self-reliant life style was positively associated with migration plans in Fairbanks, while not in Valdez. However, self-reliance as a life style has greater potential for realization in a smaller Alaskan community, and potential migrants drawn toward an urban center would not be expected to share this characteristic. Conversely, strong attitudes of self-reliance would be expected to draw people away from larger urban communities.

In summary, the characteristics which differentiate migration plans

[21] It should be remembered that marriage was also positively associated with energy project employment, for these same probable reasons. In Valdez, project employment may serve to reduce net out migration of married families, although this would not show up in the regression analysis since pipeline employment is controlled for.

in Fairbanks and Valdez appear to be largely due to factors that would influence migration patterns in these two types of communities under normal conditions. The development project itself appears to have relatively little influence on plans to migrate. In fact, only 2 percent and 4 percent of the total variance in migration plans in Fairbanks and Valdez respectively can be explained by the combination of work experiences and assessments resulting from impact. The dominant factors effecting plans to migrate appear to continue to be predevelopment personal characteristics. Some of the reasons which appear to constrain migration, such as old age and the desire to live in a small community, define population groups which we would expect to be negatively affected by the energy project. Instead, these groups are relatively less likely to plan to move.

We mentioned in our introduction to the analysis of migration plans that the reasons why people move may change over the course of the energy development. For this reason, the analysis results do not necessarily apply to moves made before the development started or moves planned only after the construction period is completed. However, the results do suggest that negative assessments of community change made during the peak of the development are not important reasons for moving. The results also suggest that residents do not tend to leave a community after the construction phase because they wish to live in a small town environment. In fact, the desire to live in a small town environment apparently is one reason for staying. It is possible that the reverse is true for moves made prior to the start of construction; the residents who like to live in a small town may be more likely to move at that time. However, in view of the negative relationship between small town living desires and moving plans observed during the peak of the development when conditions may be at their worst, we believe a reversal of the relationship prior to construction is unlikely. Figure 3-21 displays a cumulative summary of the analysis results.

COMPARISON OF MOVING PLANS BETWEEN RESIDENTS AND IMMIGRANTS

Whereas the energy project has been seen to have a minimal effect on the migration plans of residents, it has a major impact on immigrants (see Table 3-27). Among residents the largest numbers plan to stay permanently in both communities, although this is more true of Fairbanks as an urban community. In contrast, immigrants drawn to these communities are highly migratory.[22] This is particularly true of Valdez where only 13 percent plan to stay permanently and over half expect to leave the community by the end of the construction period. In essence, the population of the

TABLE 3-27

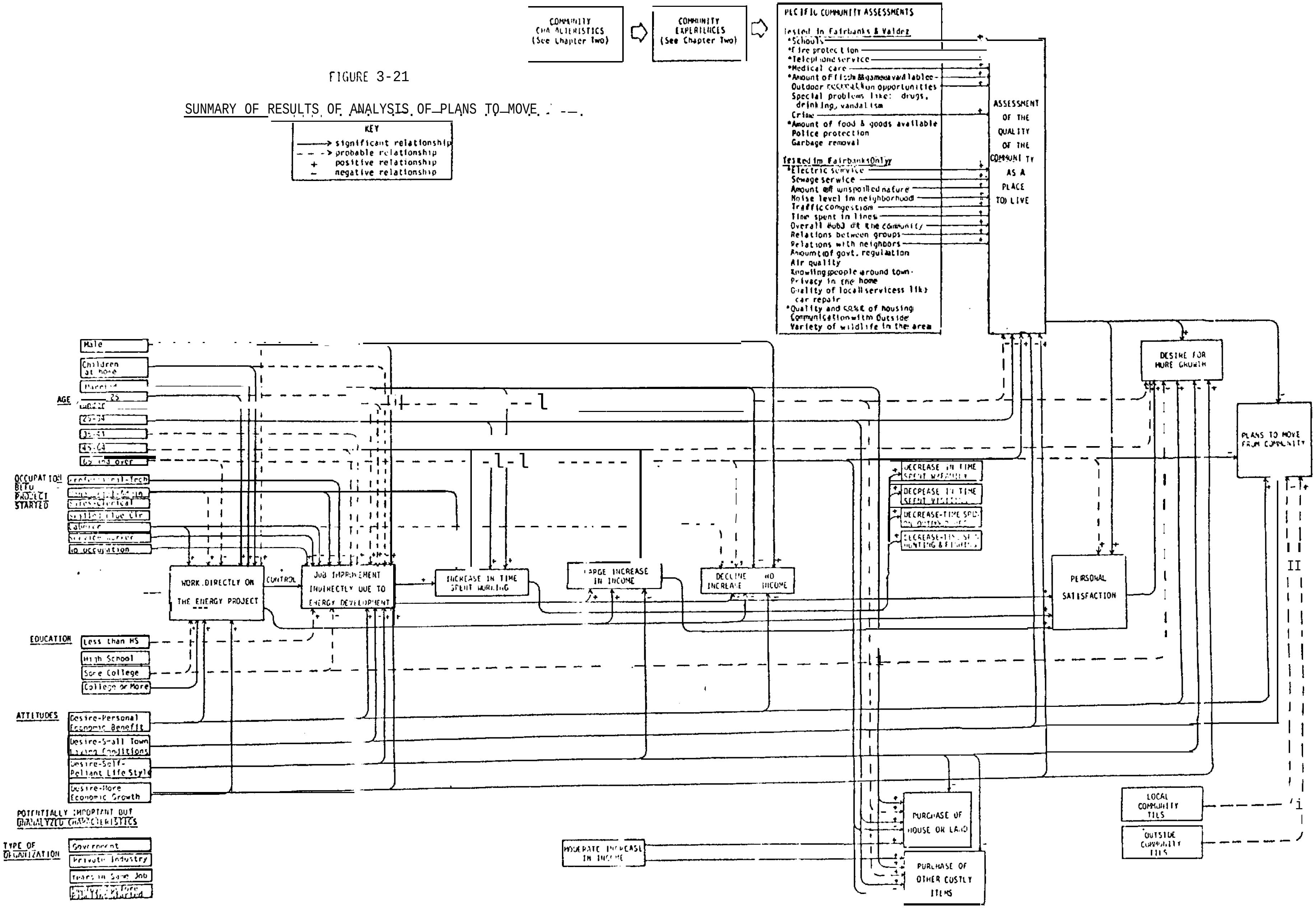
COMPARISON OF PLANS TO MIGRATE" FROM FAIRBANKS AND VALDEZ BETWEEN RESIDENTS AND IMMIGRANTS
(percent distributions)

Time of Expected Migration	Fairbanks			Valdez		
	Residents	Immigrants	Total	Residents	Immigrants	Total
Within next year	7	21	12	3	21	15
Within next 2-3 years	8	20	13	19	36	30
Sometime in future	20	21	21	29	30	30
Never (permanent resident)	65	38	54	49	13	25
	100	100	100	100	100	100
Number of Respondents:	240	168	408	209	190	399

[22] It should be remembered that these figures exclude construction camp residents. Since these are by definition temporary residents, they would obviously serve to exaggerate the differences even further.

FIGURE 3-21

SUMMARY OF RESULTS OF ANALYSIS OF PLANS TO MOVE



community is changed from one in which permanent residents predominate to one in which temporary residence is the mode. Among these immigrants, direct employment on the energy project, the maintenance of non-local social ties, younger age and a desire for more personal economic benefits constitute significant factors explaining actual migration following the end of energy project construction. Paradoxically, levels of personal satisfaction also are significantly related to migration among immigrants in Valdez, whereas satisfaction or dissatisfaction with community changes is the significant explanatory variable for residents. In Fairbanks, these changes are not as dramatic. Although the addition of immigrants serves to sharply reduce the proportion of the expected permanent population, those planning to stay permanently still constitute a significant majority. This is due to two factors. In the first instance, the proportion of new to older resident populations was lower in Fairbanks than in Valdez. Secondly, more of the newer immigrants to Fairbanks came with intentions of staying permanently. This again may be largely a function of the different sizes of the two communities.

Major Conclusions Drawn in the Individual Change Analysis

Both the reader who has successfully plowed through the last one-hundred pages and the reader who has skipped our detailed discussion of the analysis results will no doubt benefit from a brief summary of our major conclusions. The preceding pages have covered thirteen analyses performed in two case study communities. A total of sixty-six variables were entered in at least one of the thirteen analyses and we have attempted to fully explain the results of each relationship that has been tested. Further, we have shown that the thirteen analyses are not independent but, in fact, represent closely related individual changes. One change is likely to be an important cause of another change.

The most detailed statement of the relationships tested is given by Figure 3-22. Each line connecting two variables identifies one relationship. At this point it is necessary to sacrifice detail in order to present an overviewof the results. By comparison, Figure 3-23 is hopefully a simplified restatement of the relationships displayed in the previous diagram; we have collapsed many specific variables into general categories. The solid lines in Figure 3-23 indicate relationships which were tested and found to be significant. The dashed lines identify the remaining relationships which were tested; where no line is shown, no test was made. ,

Overall, the results are clearly encouraging; significant relationships can be observed between most of the general categories shown in Figure 3-23. While our detailed discussion of the analysis results make the inconsistencies and lack of specific relationships seem overwhelming at times, the analysis summary displayed in Figure 3-23 leads the reader to the opposite . conclusion. The truth obviously lies in between; the analysis demonstrates that there are a significant number of relationships which may apply to energy projects in general. At the same time, however, the analysis results indicate many hypothesized relationships do not exist and that other relationships may not consistently apply to all communities faced with a major energy development. Still other relationships could not be tested with available data.

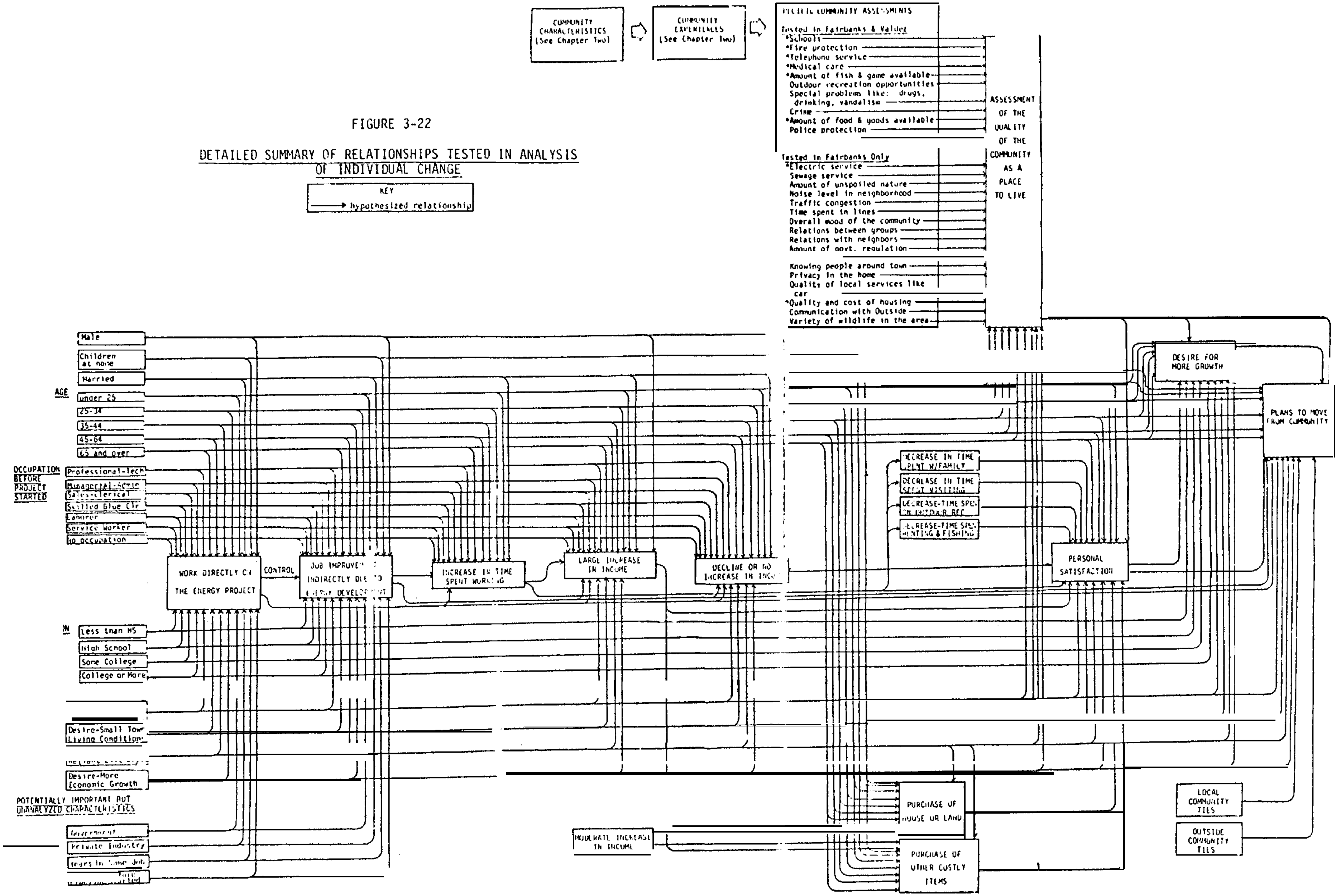
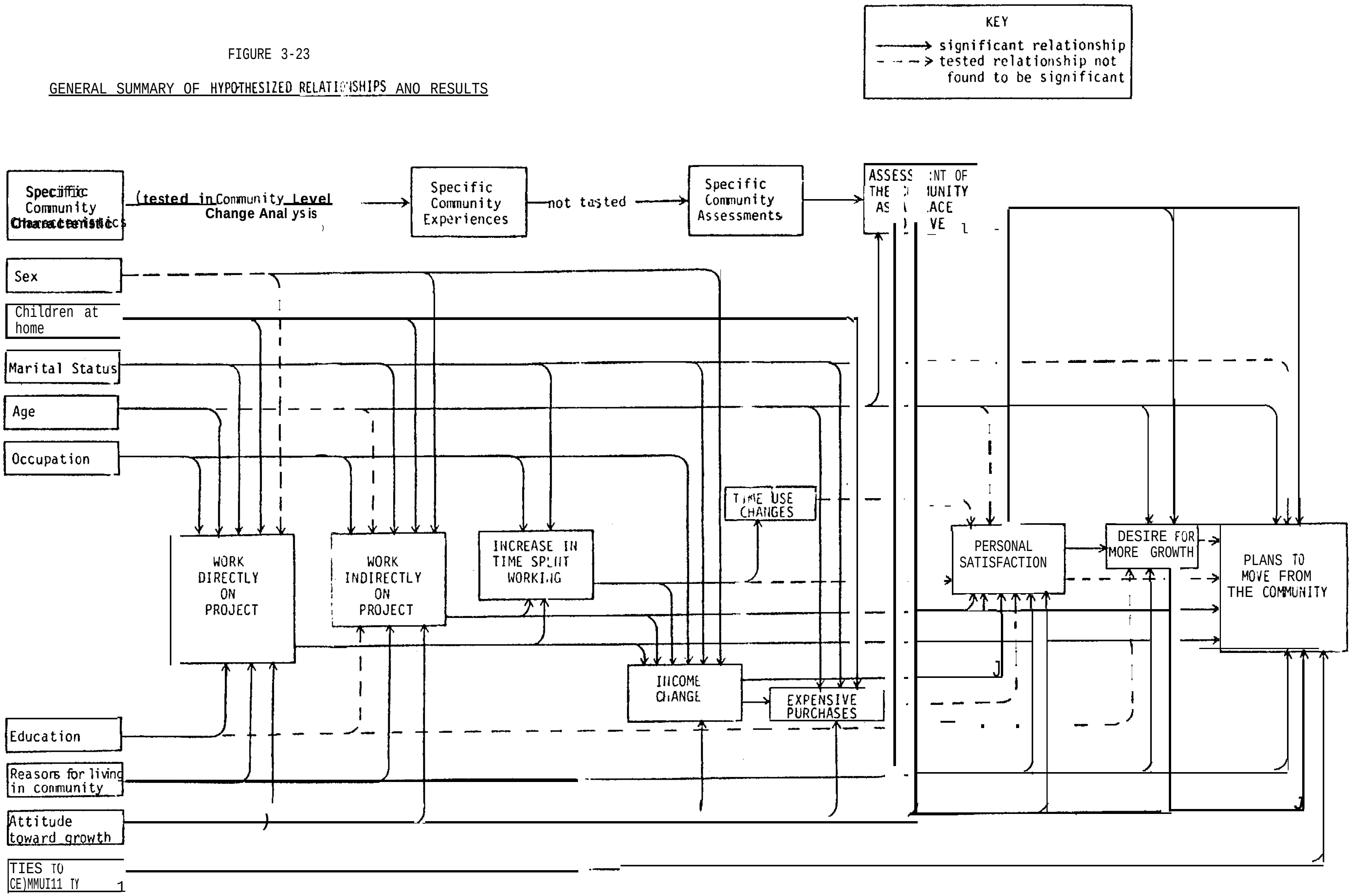


FIGURE 3-22

DETAILED SUMMARY OF RELATIONSHIPS TESTED IN ANALYSIS OF INDIVIDUAL CHANGE

FIGURE 3-23

GENERAL SUMMARY OF HYPOTHESIZED RELATIONSHIPS AND RESULTS



As we mentioned in the introduction, the research reported here is not intended to provide a definitive set of relationships between personal characteristics and changes. Even the relationships which hold in both case study communities may not apply elsewhere. However, there is a good chance that both the analysis approach and results employed will be useful. The remainder of this chapter is devoted to a summary of the major conclusions drawn in the Individual Change component analysis. Our major conclusions are:

- Each resident of a community is not equally likely to work on an energy project; personal circumstances and skills affect the likelihood of employment. A resident is more likely to work on an energy project if he or she:
  - is married
  - does not have children at home
  - is young
  - has worked as a laborer
  - is not a college graduate
- The analysis results suggest that both the type of occupation and the type of employer change the likelihood that a resident will work on an energy project. While the type of employer was not included in our analysis, the results appear to indicate that residents employed in jobs which offer long term benefits (example: government jobs) are not likely to work on an energy project.

- The effect of personal attitudes on the likelihood of energy project employment is not as clear but we interpret the analysis results to show that a resident is more likely to work on an energy project if he or she:

  - desires more personal economic benefits
  - desires more community growth
  - does not have a strong desire to live in a small town

- Differences in the outside forces for change between two communities apparently affect the relationships between personal characteristics and personal experiences. If an energy project involves an administrative headquarters in a community, then residents with clerical skills are relatively more likely to work on the project.

- The results also suggest that the desire to lead a self-reliant, "Alaskan" life style does not make it less likely that a resident will work on an energy project.

- As expected, immigrants are much more likely (two to three times, in fact) to work on an energy project than residents.

- Residents are not equally likely to benefit from employment opportunities indirectly created by an energy project. Those that are more likely are:

  - married
  - without children at home

male

- young
- not employed in a professional-technical, managerial-administrative, laborer or service occupation
- interested in more personal economic benefits
- not strongly interested in small town living conditions
- interested in leading a self-reliant life style
- interested in more community growth

o Immigrants, and not residents, are more likely to benefit from employment opportunities indirectly created by an energy project.

o Either direct or indirect employment related to an energy project appears to be an important cause of increased time spent working.

o Marriage, being young and/or being employed in a managerial or administrative occupation are also important in explaining which residents increase the time they devote to work.

o Immigrants are more likely than residents to increase the time spent working.

o Both direct and indirect employment related to an energy project increases the likelihood that a household will receive much larger incomes (increases of $10,000 ore more) during the construction phase of an energy project.

- Personal characteristics also appear to partially explain why some residents experience large income gains. However, we were not able to identify consistent effects in the two case study communities. We suspect that the inclusion of the type of employer in the analysis would substantially reduce these inconsistencies.

- Female heads of household and married residents (that is, not single males) are less likely to experience fixed incomes or income declines. Although female heads of household tend to have lower incomes than others, an energy project apparently offers an opportunity to make greater relative gains in income.

- Immigrants are more likely than residents to experience either large increases in real income (adjusted for cost of living differences) or income declines. Residents are more likely to experience moderate income increases.

- Increases in the time devoted to work significantly decreases the time residents spend:

  - with family
  - visiting
  - on outdoor recreation activities
  - hunting and fishing

  The most important effect is on family time; the least important effect is on the time spent hunting and fishing.

- Large increases in income are not immediately translated into heavier than normal expenditures on housing and other costly i terns. Instead, it appears that more gradual income increases (although still rapid compared to outside Alaska) are associated with heavy consumption. In addition, residents who are young, married and who are not interested in leading a self-reliant life style are more likely to make major purchases.

- Although immigrants are more likely than residents to experience large income increases, they are less likely to make large purchases.

- Seventeen specific types of perceived community changes show a significant relationship to residents' overall assessments of community change. These include changes in the quality of:

  - schools
  - telephone service
  - medical care
  - fire protection
  - amount of fish and game available
  - outdoor recreation opportunities
  - social problems like drinking, drugs and vandalism
  - crime

- electric service
- sewage, service
- amount of unspoiled nature
- noise levels in neighborhoods
- traffic congestion
- time spent in lines
- overall mood of the community
- relations between groups
- relations between neighbors

- The analysis results suggest that immigrants are selective in their choice of community. Immigrants to a small community tend to think that a small town living environment is more important than do immigrants to a large community. As a result, immigrants to a small community may be more sensitive to the loss of small town values than the residents of the small community.

- Personal satisfaction during the peak construction phase of an energy project is primarily dependent on work experiences related to the project and income changes. Residents who did not have such work or income experiences believe that they are bearing the costs of development.

- Assessments of community change also affect personal satisfaction, but the effect is not strong.

- Decreases in the time spent with family, on leisure activities and on social relationships do not greatly affect personal satisfaction. While decreases in the time spent on these activities are experienced by many residents, they are accompanied by personal economic gains. Apparently large economic gains outweigh these social costs in the minds of community residents.

- Immigrants are more likely than residents to believe they are receiving the benefits of the energy project.

- Residents' attitudes toward community growth do not change greatly during the construction of the energy project but negative personal and community experiences appear to cause some reduction in the desire for more community growth.

- Immigrants appear generally to favor more community growth, but not necessarily to a greater extent than residents. Predevelopment measures of resident attitudes are necessary before it is possible to say that immigrants will increase pressures for community growth.

- Moving plans among residents do not appear to be greatly affected by an energy project.

- Residents who believe that the community has changed for the worse during the construction of the energy project are not substantially more likely to move from the community following the construction phase.

IV. ASSESSMENT OF RESEARCH METHODS EMPLOYED AND IDENTIFICATION OF RESEARCH NEEDS

Chapters Three and Four have described the methods and results of the Predictive Indicator Study. We turn now to an evaluation of the approach taken in the project as a whole and to an assessment of the specific methods employed in the Individual and Community Level Change components. As we noted earlier, the project is fundamentally experimental in nature. As such, we should expect to find successes and failures in the experiments themselves. Evaluations of these experimental outcomes have already been made in the last two chapters. Our intent here is to evaluate the design of the experiments, not their results.

Choice of Case Study Communities

ALASKAN OCS EXPERIENCES

The adopted research approach is based on actual impact experiences. These experiences preferably should cover the full range of those that are likely to result from OCS developments. Obviously, the optimal choices would be among actual OCS developments such as those associated with the Upper Cook Inlet petroleum field. In order to control for differences in outside forces for change, several developments representing various magnitudes and types of outside forces would have to be included in the analysis. Alaska has yet to experience a wide range of OCS developments; an analysis of all existing Alaskan OCS developments would still fall short of providing a comprehensive data base for OCS impact predictions.

Not only does the Predictive Indicator experimental approach depend on the availability of actual impact situations, it also requires a substantial amount of data that can only be gathered during the period of most active development. Unfortunately, the Alaskan OCS experience has not been documented. As an alternative, non-Alaskan OCS experiences could provide an alternative data base if we assume the range of individual and community characteristics present in Alaska can be observed elsewhere and that the forms of OCS developments are themselves similar.

NON-ALASKAN OCS EXPERIENCES

Interestingly, the lack of documented OCS experiences is by no means unique to Alaska; of over 200 current research projects concerning social and economic impacts of energy development reported by the Smithsonian Science Information Exchange, for-example, none address the relationship between OCS generated outside forces for change and individual and community characteristics. [1] Even if such studies were being conducted, the vast majority of OCS developments to date have occurred in the Gulf of Mexico under widely different circumstances from those expected in Alaska. The most similar OCS developments appear to be in the North Sea region. There, however, individual and community characteristics may differ markedly from the characteristics present in Alaska. While the North Sea OCS experience should certainly not be ignored, a study focus that fits more closely with Alaskan conditions

[1] Smithsonian Science Information Exchange, Inc., CB03-42 Social and Economic Impact of Energy Development, Aug. 1978.

seems at least equally preferable.

A major research effort directed at future OCS developments is being funded by the U.S. Department of the Interior (Resource and Land Investigation Program) and carried out by the New England River Basin Commission.* Publications already generated by this effort should prove to be of great value to those wishing to address a wide variety of OCS issues. However, it does not appear that the current research program specifically considers the effects of differing individual and community characteristics on change.

NON-OCS ALASKAN EXPERIENCES

A second alternative to the ideal of a series of documented Alaskan OCS experiences is to use other Alaskan energy development experiences as a basis for analysis. The sacrifice involved with this alternative is clearly a matter of degree; the more similar the development, the smaller the sacrifice. The degree of sacrifice also depends on the similarity of the communities and population groups affected by OCS and non-OCS developments in Alaska. There does not appear to be a better alternative than using non-OCS Alaskan development experiences but its value cannot merely be assessed in relative terms. In order to evaluate the utility of non-OCS Alaskan developments in absolute terms we must take a closer look at the examples that best fit the requirements of the study.

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[2] New England River Basins Commission Resource and Land Investigation Program (NERBC-RALI) Project Reports include: 1) _Factbook on onshore facilities_ (November 1976); 2) _Estimates for New England_ (November 1976); 3) _Methodologies for OCS-Related Facilities Planning_ (March 1978); 4) _Case Studies in OCS Planning_ (July 1978). NERBC, 53 State Street, Boston, Mass. 02109.

Differences In Magnitude Of Outside Forces

Specifically, we need to know how similar the outside forces associated with the Trans-Alaska oil pipeline are to those expected for onshore OCS developments. The Predictive Indicator Study focusses on changes during the construction phase of development. Both oil pipelines and OCS facilities do not require large numbers of employees during the operations, but both can employ a large work force during construction. However, the most common onshore OCS facilities, such as temporary and permanent service bases and heliports are likely to require a much smaller construction workforce than that employed in Valdez and Fairbanks during the construction of the oil pipeline and terminal facilities.

The population and employment increases in Fairbanks during pipeline construction were greater in absolute terms than the increases expected for the most frequent forms of OCS development. On the other hand, Fairbanks is much larger than the communities which are likely to experience OCS developments. The relative increases in population and employment in Fairbanks are, in fact, probably roughly comparable to those expected in communities facing OCS development. The 160 and 270 percent increases in population and employment respectively in Valdez, in contrast, are likely to be larger than expected for most forms of OCS developments. On the other hand, gas processing and treatment plants, marine terminals and refineries built in connection with OCS production may require comparable increases in population and employment. We cannot conclude whether differences in the magnitude of the outside forces between the pipeline and probable OCS developments would be likely to influence our predictive relationships, The larger absolute changes in Fairbanks and Valdez may serve to enhance the analysis by making the relationships more readily observable. Incomparable patterns of change might also result from such differences. Our own guess is that the fact that population and employment increases are common outside forces for change is more important than the fact that these increases may be of different magnitudes. However, the magnitude may be important if the potential development is very small in comparison with the size of the workforce (i.e., less than ten percent). This is because the increase in employment demands in Fairbanks and Valdez was probably large enough to offer a job opportunity to anyone who wanted to take one. If the development were very small, personal characteristics might show not consistent relationships with change; particular personal situations would become too important. Since we are focusing on relationships between individual and community characteristics and change and not attempting to show that the actual changes in Fairbanks and Valdez will be duplicated in communities which experience OCS development, we suspect differences in the magnitude of outside forces for change do not substantially compromise the validity of our results as long as the number of employment opportunities created is roughly equal to ten percent or more of the local workforce.

Qualitative Differences in Outside Forces

Aside from differences in magnitude, outside forces for change may also differ in qualitative terms. For example, the specific mix of employment demands is likely to differ between our case study communities and potential onshore OCS developments. The analysis results previously reported in Chapter Three suggest that some of the relationships between personal characteristics and change may be affected by differences in the forces for change. The relatively greater demand for white collar employees in Fairbanks appeared to affect the relationships between such occupations and the likelihood of working on the project. However, the effect was not large, probably because Fairbanks also has a relatively larger white collar workforce. We suspect most communities which support the administration or management of an energy project will be relatively large; therefore, the effects of differences in forces for change may be counterbalanced by the effects of differences in community size.

We also found that in Fairbanks and Valdez skilled blue collar workers were not likely to participate directly in the development activity; perhaps this observed relationship may be the result of the general fact that energy developments tend to require specialized skills that are not common in Alaskan communities. Again, we have insufficient data to conclude one way or the other. The observed relationships certainly should be used with an eye open to the possibility that qualitative differences in outside forces will be associated in different ways with individual and community characteristics. We should not forget, however, that energy developments have much in common. All will create significant job opportunities in skilled and unskilled blue collar trades. Wages and salaries are likely to reflect the premium placed on timely project completion and be higher than prevalent wages and salaries. Providing camps are used, similar types of service demands will be made on the community. Again, while our case study communities clearly are not perfect, it appears that the types of outside forces for change are similar enough to justify analytical comparisons.

Differences In Individual Level Characteristics

The validity of our research design also depends on the comparability of individual and community characteristics in the case study communities to the characteristics present in communities which may experience OCS developments. The choice of Fairbanks cannot be justified simply because it is an Alaskan community; in fact, Fairbanks does not appear to resemble most potential OCS development communities at all. First, it is obviously not a coastal community. Second, it has only a limited resource-based industrial sector; agriculture, fisheries and forestry are not important sources of jobs in Fairbanks. Third, Fairbanks has a smaller proportion of native residents than most coastal communities (except Anchorage, of course). Finally, Fairbanks is at least ten times larger than most communities of interest.

Valdez differs from Fairbanks in that it is a coastal community. Like Fairbanks, however, most community residents are non-native. While Valdez had a limited fishing industry, it was declining even before the energy development became a force for change.

Even if the outside forces were identical, the above differences clearly prevent us from claiming that the observed social, economic and physical changes in Fairbanks and Valdez can be expected in another community experiencing OCS development. However, this does not mean Fairbanks or

Valdez are worthless or even poor as comparative cases, The analysis of individual changes depends on having a data base which contains a wide variation in individual characteristics. It does not require that these individual characteristics be present in the same proportions in OCS communities. This is because the case study data is simply used to isolate the effects of specific individual characteristics. These effects are independent of the numbers of people who possess a given characteristic. For example, the finding that persons who have a college education are less likely to participate in new employment opportunities is not dependent on the proportion of persons in a community who possess that level of education. When the observed distribution of individual characteristics in OCS communities are combined with our case study findings the predicted changes will vary, not because the effects of individual characteristics will vary, but because the individual characteristics upon which the effects operate will vary. Turning back to our example, if twenty percent of the residents of community A have a college education and only five percent of the residents of community B have a college education, then, all other things being equal, community A is likely to have a lower rate of participation in the new employment opportunities than community B.

Predicted levels and directions of change will depend on how all of the relevant effects combine within a specific community. Community A may have more college educated residents but may also have more families with no children and more residents who would like to increase their incomes than Community B. The combined effects of all of these variables may indicate that Community A is likely to have a higher rate of participation than Community B,

Fairbanks and Valdez are useful as case study communities for the analysis of individual change because they are made up of relatively large diverse populations. Most important individual characteristics are present in large enough proportions to enable us to isolate their effects. Unfortunately, we cannot say that all important characteristics are sufficiently represented. Ethnic background is the most important characteristic that we cannot address. Less than ten percent of the Fairbanks and Valdez populations are Native; our samples do not include enough Native residents to reliably isolate the effects of this characteristic. A further complication is that Native cultural groups (Athabascan, Tlingit, Yupik, Inupiat, Aleut) are likely to differ in their reactions to outside forces for change. The relatively small Native populations would have to be further subdivided to reflect these potential differences.

On the positive side, our analysis approach does not preclude the addition of variables. The deficiencies of Fairbanks and Valdez as case study communities need not be deficiencies of the research approach as a whole. For example, a recently completed ISER study involving the residents of the North Slope of Alaska provides a new data source that can be subjected to a parallel analysis.

Differences In Community Level Characteristics

Differences in community level characteristics between Fairbanks and potential OCS communities present a thornier problem. At the community level of analysis characteristics do not vary much within communities. Significant physical, institutional and resident characteristics that are common in OCS communities are not present in the same form in Fairbanks. For example, bonded contractors, equipment suppliers and the headquarters of the telephone utility are based in Fairbanks. As a result, Fairbanks does not provide a useful base for identifying the effects of specific community characteristics. Fairbanks, however, is the Alaskan community that has recently experienced the effects of energy developments for which we have the best data. Since the research approach can only be applied in cases where actual impacts have occurred, we are faced with the options of either: one, sacrificing our ability to generalize to OCS communities by identifying relationships that are relevant mainly to Fairbanks; or two, scrapping the research approach for some unknown alternative; or three, attempting to address the comparability problem while still benefiting from the Fairbanks impact experience.

The research design for the Community Level Change component has evolved from our attempt to accomplish the third alternative. This was done by limiting our analysis in Fairbanks to tests of hypothesized relationships between community changes and broad conceptual variables, rather than specific community characteristics. Our assumption is that while specific community characteristics will differ, the effects associated with our conceptual variables will hold.

At the community level, then, the Fairbanks experience has served to provide a general test of our assumptions. Fortunately, we were able to use Valdez as a developing ground for specific community characteristics that should affect response patterns in potential OCS communities. Since the relationships of specific community characteristics to change were developed largely on the basis of the Valdez experience, however, we cannot justifiably test these relationships in Valdez as well. Tests of specific relationships will require analyses of future energy developments.

Differences In Measurement

The final research approach in the Community Level Change component did not involve a direct comparison of measures in Fairbanks and Valdez, so measurement differences are not an issue for this component. Direct comparisons were made, however, in the Individual Level Change component. To no one's surprise the development of comparable variables from two independently produced data sets proved to be an enormous challenge. Over 1200 and 800 lines of computer programming in Fairbanks and Valdez, respectively, were necessary along with countless hours of testing and consultation. Despite these efforts, measurement gaps and differences remain. The instances in which these differences were thought to in part account for observed experimental outcomes have been discussed in Chapter Three. The issue is raised again here because it is likely to retain its importance as attempts are made to incorporate new research results. Improvements in measurements will inevitable make comparisons difficult. Our own experience with the Fairbanks and Valdez data sets suggests that a substantial number of empirical comparisons are possible even when studies are run independently. A minimal amount of coordination, moreover, is likely to dramatically improve our ability to use case studies in an ongoing research program.

Conclusions Regarding The Validity Of The Research Design

In order to predict the impacts of OCS development, the relationships between forces for change and intervening variables must be known. Lacking any a priori reasons for assuming what the magnitudes and directions of these relationships are, we are forced to turn to direct observations. Our choices are further limited to actual impact situations that either can be observed or that have been adequately documented. In this imperfect set of circumstances the impact experiences of Fairbanks and Valdez are comparatively attractive as targets for research. We have attempted to outline in this chapter some of the reasons why our experimental approach is imperfect and accordingly what qualifications should be placed on the results.

To briefly summarize our discussion, the outside forces associated with the Trans-Alaska pipeline roughly correspond in absolute terms to the upper limits of those expected with OCS development. At the same time, Fairbanks is larger than most potential OCS communities, so in relative terms the magnitude of development pressures in Fairbanks more closely corresponds to an intermediate OCS development. The development in Valdez is comparable in both relative and absolute terms to the magnitude of a major OCS development. The types of outside forces for change appear to be similar enough to justify analytical comparisons but observed relationships may shift under different types of development. The direction of possible shifts should in many cases become evident from a comparison of development pressures,

Differences in the distribution of resident characteristics within the case study and potential “OCS communities poses no major analytical problems with the exception that we were not able to isolate the potential effects of ethnic characteristics on actual impact experiences. Since ethnic characteristics were omitted from the analysis as a result of practical and not theoretical problems, we expect that it will be possible to incorporate it into the analysis as suitable data becomes available. The ISER North Slope Survey results should be appropriate for this purpose.

The design of the Community Level Change component proved to be the most troublesome task of the study as a whole. The Fairbanks community impact experience was assessed to be relevant only to the identification of general relationships between community characteristics and types and magnitudes of change. Valdez, in turn, proved to be useful in developing more specific relationships. These relationships could not then be tested in Valdez, however, since to do so would clearly involve a circular comparison. Thus, the Fairbanks and Valdez experiences each contributed to the analysis of community level changes but not in the manner originally intended. We were not left with a way to compare relationships in two communities as we were in the case of our Individual Level Change component. That comparison must wait until impact observations are made in small communities.

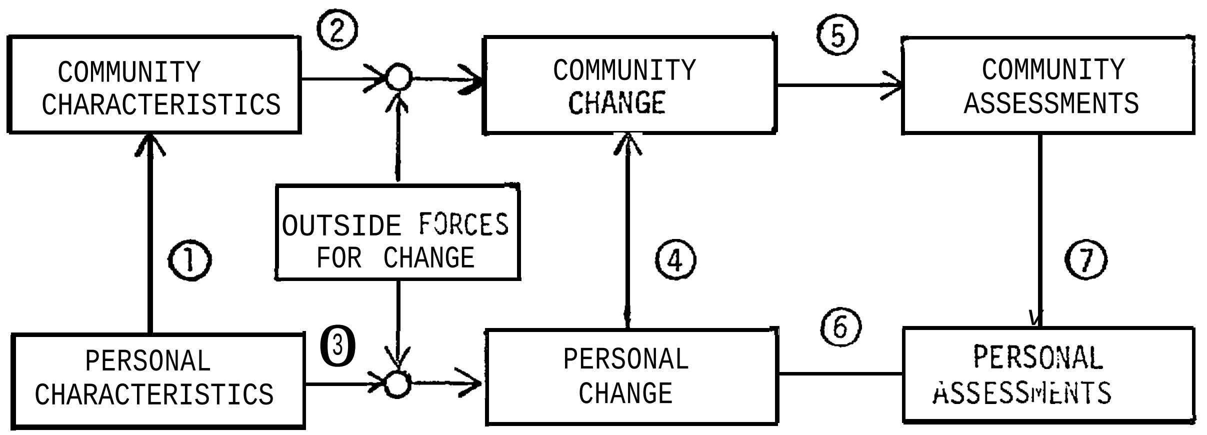
Finally, the use of two existing survey data sets as the basis of our analysis of individual changes raised frustrating but not lethal problems that could be substantially diminished by a more integrated research approach.

Overall, the experimental designs employed in both the Community and Individual Level Change components appear to offer promise as mechanisms by which we can start to pin down elusive individual and community impacts. The experimental results are sufficiently concrete that replication and refutation are possible. Judged by the standards of pure science, the approaches employed are seriously deficient in experimental controls. We are convinced, however, that social impact predictions can only be improved by repeated experimentation despite the shortcomings which stem from a forced reliance on natural experiments. Only by testing our assumptions can we hope to advance beyond the guess-work that characterizes current impact projections.

Links Between Individual and Community Level Change Components

Up to this point in the report we have treated Community and Individual level changes separately. This was necessary because the research methods employed for each differed. However, there are obvious links between the two components which are displayed in Figure 6-1. First, aggregate personal characteristics are an important part of the set of community characteristics. For example, the human resources available to respond to increased service demands can be expressed in terms of the sum of personal employment, training and skill characteristics. (See

FIGURE 4-1
MAJOR LINKS BETWEEN INDIVIDUAL AND
COMMUNITY LEVEL CHANGE COMPONENTS



number (1). The effects of outside forces for change are directly influenced by both community and personal characteristics (see numbers (2) and (3)). Community changes are also influenced by personal changes (see number (4)). For example, increasing incomes result in increased demands for housing and other costly items.

The Community Level Change component focused on five objective community changes which are assessed in the Individual Level Change Component (see number (5)). However, the Predictive Indicator Study was not designed to address all of the specific links between objective community changes and assessments of thos-e changes. In order to do so we would have to expand our study of community level change to the entire spectrum of specific changes rather than concentrating on only five.

The link between personal change and personal satisfaction is, of course, a central focus of the Individual Level Change component (see number (6)). Personal satisfaction is also influenced by community assessments (see number 7); this is the most important link between individual and community level change. It is also a link that is addressed in the Individual Level Change component.

We cannot use the link between community assessments and personal satisfaction (see number 7) in a prediction of change unless we know the relationships between community characteristics and community changes (number 2) and the relationship between community changes and community assessments (number 3). This is because the effect of the community assessments on personal satisfaction will obviously depend on the changes that are predicted to occur.

Research Needs

Referring back to Figure 6-1 as a frame of reference, further research is clearly required for each link in the diagram but several deserve particular attention. The scope of community changes considered should be broadened to include changes in physical conditions such as in air quality, traffic congestion and outdoor recreation opportunities. Then the links to community characteristics (2) and to community assessments (5) should be investigated.

The relationships between personal characteristics and personal change may depend on the types and magnitudes of the outside forces for change. We have assumed that relationships identified in the case study communities will apply to a broad range of development situations. This assumption clearly requires testing. At a conceptual level a first step can be taken by setting forth the possible ways in which differences in the type and size of the development may change the observed relationships. Alternative predictive relationships can be hypothesized and tested. Of course, these tests must be based on information collected during new developments.

Continued application of the research approach in communities undergoing major energy developments is not only necessary in order to test the effects of differing outside forces for change. It is also necessary in order to test whether the relationships identified in Fairbanks and Valdez can be generally applied to other populations and in order to explore the effects of other personal and community characteristics on change. These relationships should be tested as soon as possible in Native communities affected by major developments.

Since we do not know which communities, if any, will experience major onshore OCS developments, the suggested baseline measures should be made in all communities which may be affected. In addition, current community conditions and individual situations should be described so that accurate measures of changes can be constructed in the event of a major development. Such measures should include those applicable to as many of the twenty-eight types of community changes identified in Chapter Three as possible and at least the following individual measures: household income, time spent working for pay, time spent on subsistence activities, dependency on subsistence goods, ownership of hunting and fishing equipment and current housing conditions.

Finally, our research has been confined to immediate individual and community responses to largely short term outside forces for change.

Even though the outside forces for change may be temporary, such forces may cause long term changes at the individual and community level. For example, we do not know the fate of residents who economically profitted from the construction of the oil pipeline and terminal facilities. Perhaps these short term economic gains provided long term benefits or perhaps they were translated into long term economic burdens. The research approaches employed in the Predictive Indicator Study can be readily extended to include longer term effects, although it would require more than one phase of data collection and larger initial sample.

Throughout this report we have stressed that our results are not conclusive but rather are intended to set the stage for an on-going research effort. Baseline observations should be made in each community which may be affected by energy developments. Observations should be deliberately designed to include the individual and community characteristics that have been identified as important intervening variab'es. Of course, additional measures of potentially significant characteristics should be included as wel 1. It is critical that the measures of individual and community characteristics not be obtained on a piecemeal basis. If only some characteristics are measured the strength of the research approach is largely lost. Our analysis also shows that the cumulative effects of many characteristics operate to shift individual impact experiences. In order to take advantage of this finding, the entire spectrum of characteristics must be measured for each individual for whom any observations are made. While in-depth studies of specific individual characteristics may provide valuable insights concerning casual relationships one must not lose sight of the importance of all the other relevant characteristics, Both research approaches stand to gain from a coordinated research design.

Once baseline measures have been obtained, impact predictions should be made as a basis for comparison against actual impact experiences. In this way a truly iterative approach to impact assessment can be achieved.

V. COMMUNITY OPERATIONAL MEASURES

Construction and development of the community operational measures has been described in Chapter 2. In this chapter the community field instruments will be presented and discussed. The discussion will cover the use of the instruments, the sources of the data and the scoring system. A final section of the chapter will describe and discuss the demonstration of the use of the instrument in three Kenai Peninsula communities: Seward, Homer and Seldovia. The purpose of the demonstration project was to field-test the instruments. The field test resulted in many modifications. The instruments presented in this chapter result from that modification.

Organization of the Field Instruments

As previously mentioned in Chapter 2, once all of the operational measures had been developed, we identified all those items that were common to two or more services and consolidated these into the general section of the community instrument. At that stage, therefore, the field instrument consisted of a general section and six service specific sections. As soon as we began to try to use the field instrument we realized that this organization would be unsatisfactory. It is generally known by those who engage in social and economic research in Alaska that the state lacks a reliable and comprehensive data base. Obtaining community information is a problem. Figures are available for census years but the validity of these is questioned. Obtaining accurate historical data is almost impossible. Various agencies that require information carry out their own data collection but there is little cooperation between the different agencies and frequently there are wide discrepancies between the figures. Even for the major Alaskan urban areas, reliable statistics are not available; the situation in rural areas is worse.

In trying to identify sources for the data that we required to complete our community profiles, we had varying experiences. For some items, such as community population figures, no single set of reliable and definitive figures were available. Many population figures existed but the validity of most were questionable. For this data and for many other items we had to identify potential sources of the data and assess which seemed to be most reliable. We also discovered that for some items, although no formal figures were available, there were individuals in the communities who would have the data, while the only way to obtain other items would be by including them on the survey instrument required by the individual change component of this study. This identification of the best sources for the data we needed was partially developed as a product of our work in Valdez and partially as a result of the demonstration of the use of the instrument in the Kenai Peninsula towns.

The outcome of this source identification was a reorganization of the field instrument into three component parts:

- Those items for which the source of the required data is outside the community,
- Those items for which the source of the required data is key people within the community,
- Those items for which the required data is not available and must therefore be gathered by survey research within the study communities.

Each of the three sections will be presented and discussed separately. It is not, however, intended that they should be used separately. The sections are not self-contained, and have no meaning when standing alone. The three sections together provide a community field instrument to be used for measuring potential service response to increased demand. Three separate research tasks have to be carried out to obtain all the data for each community. Our method of organization derives purely from our assessment of the best source for each of the items of data that we require. Although we have identified what we consider to be the best source for each item, it may occasionally happen that for a particular community the item of data will not be available from the identified source. In this situation the researcher will have to exercise his or her judgement as to how best to obtain the data. The majority of questions require current data. Where formal data is involved, this refers to the most recent figures available. Questions are framed to be generally applicable. If in any particular case a question is not applicable it should be so marked (NA) and no score should be given for the item. Details of methods of scoring are included on the instrument for every item. A discussion of interpretation of the scores follows later in this chapter.

Community Field Instruments

Section A: Data to be Collected from Outside the Study Community

Most of the items included in this section require data that is unlikely to be available in the community. Few communities, for example, have detailed population figures or age or employment statistics. Such data are, however, regularly compiled by state and federal government agencies. Such data is generally available in documented form. In each case, our cited source is the one we considered to be the most reliable for the specific item of data.

Scoring methods for each question are included and explanations are given wherever calculations are required.

The first twenty questions in Section A are all general measures of community development and development potential, although some of the items, such as those relating to access and transportation costs, are also relevant to specific community services. The remaining questions in Section A are service-specific questions for which the data is available outside the community. We have made the assumption that the School Administration and School Board offices, the FAA Service Station, and the Utility Managers will be outside the study community because in most cases they will be. In those instances where these offices are located within the study community the information will be gathered in the community from the source identified in Section A.

COMMUNITY RESPONSE PROFILE

SECTION A: Data to be collected from outside community

Name of Study Community ______________________

period of Data Collection ___/___/___ to ___/___/___

Data Collected by (list) ______________________

____

____

____

1. Population: Community population figures for previous 10 year period:

	N	% change +/-
19__	______	______
19__	______	______
19__	______	______
19__	______	______
19__	______	______
19__	______	______
19__	______	______
19__	______	______
19__	______	______
19__	______ (current figure)	______

Score for current population:

N 0 - 50	No Score
N 51 - 200	= 1
N 201 - 500	= 2
N 501 - 1,000	= 3
N 1,001 - 5,000	= 4
N 5,001 - 10,000	= 5
N 10,001 - 50,000	= 6
N 50,001 - 100,000	= 7
N 100,001+	= 10

Score for population growth:

Sum % change column and divide by 10. If figure resulting is +3% or greater, score 2 points.

Source: State of Alaska, Department of Labor Statistics

. Family Size: Average family size for community _
If 4.0 or less, Score 1 point

Source: State of Alaska, Department of Labor Statistics

Community Age Distribution

Age	N	% Total
0 - 9		
10- 19		
20- 29		
30- 39		
40 - 49		
50- 59		
60+		

. ______%

Sum the % population between 20 and 59. If 50% or greater, score 2 points

Source: State of Alaska, Department of Labor Statistics

Community employment for census occupation categories

Census Occupation Categories		N	%
I	Professional, Technical		
11	Managers & Administrators		
111	Sales & Workers		
IV	Clerical & Kindred		
v	Craftsmen		
VI	Operatives (excl. transport)		
VII	Transport Operatives		
VIII	Laborers (excl. farm)		
Ix	Farm Laborers & Foremen		
x	Service Workers		
XI	Private Household Workers		
x11	Unemployed		

Workforce participation rate = current workforce - unemployed, expressed as % of total population. If 25% or greater, score 2 points

If total % for categories I & II combined is 25% or greater, score 2 points

If total % for categories IV, V, VI, VII combined is 25% or greater, score 2 points

u

If total % for category VIII is between 20 and 30%, score 2 points

Source: U.S. Department of Commerce, Bureau of the Census, or State of Alaska, Department of Labor Statistics

Community workforce figures for previous 10 year period.

	N	% change +/-
19_	________	________
19_	________	________
19_	________	________
19_	________	________
19_	________	________
19_	________	________
19_	________	________
19_	________	________
19_	________	________
19_	________ (current figure	________

Score for workforce growth:

Sum % change column & divide by 10. If figure resulting is 3% or greater, score 2 points.

Source: State of Alaska, Department of Labor Statistics

Community income: Per capita income for community for previous 10 year period

	$	% change +/-
19_	________	________
19_	________	________
19_	________	________
19_	________	________
19_	________	________
19_	________	________
19_	________	________
19_	________	________
19_	________	________
19_	________	________

Score for income growth:

Sum% change column & divide by 10. If resulting figure is 5% or greater, score 2 points.

n

Score for current per capita income:

$2,500 or less	= 0
$2,501 - $4,000	= 1
$4,001 - $5,000	= 2
$5,001 - $7,500	= 3
$7,501 - $10,000	= 4
$10,001 - $20,000	= 5
$20,001 +	= 6

Source: U.S. Department of Commerce, Bureau of the Census, Current Population Reports Population Estimates & Projections, or, State of Alaska, Bureau of Economic Analysis

7. Community welfare recipients

	N	
Number of community population receiving welfare payments	________	
Proportion of total population receiving welfare payments	________ %	

If proportion is 15% or less, score 2 points.

Source: State of Alaska, Department of Health & Social Services, Division of Public Assistance

8. Community cost of living index

Cost of living index for this community taking Seattle as 100 base point ________

If community CPI is 100 - 115, score 3
116 - 130, score 2
131 - 145, score 1
146+ no score

Source: U.S. Government, Department of Commerce for Seattle Consumer Price Index, "Alaska Interregional Cost Differentials" (ISER) used as base to calculate community figure.

9. Average wage rate for laborers

Community average wage rate for general laborer

$________ per hour

If community rate is greater than or equal to Anchorage rate ($________ per hour), score 1 point

Source: State of Alaska, Department of Labor, Research & Analysis Division

10. Community Building Permits for previous 10 year period

	N	% change +/-
19__	________	________
19__	________	________
19__	________	________
19__	________	________
19__	________	________
19__	________	________
19__	________	________
19__	________	________
19__	________	________
19__	________	________

Not Applicable ________

Score for building permit growth:

Sum% change column & divide by 10. If resulting figure is + 5% or greater, score 1 point

Source: U.S. Government, Department of Housing & Urban Development, Area Office

11. Community Gross Receipts for previous 10 year period

	N	% change +/-
19__	______	______
19__	______	______
19__	______	______
19__	______	______
19__	______	______
19__	______	______
19__	______	______
19__	______	______
19__	______	______
19__	______	______

Score for growth in gross receipts:

Sum % change column & divide by 10. If resulting figure is +5% or greater, score 2 points.

Source: State of Alaska, Department of Commerce, Division of Economic Enterprise

12. Community Government

a) Is the community located in an organized borough? Yes/No. for 'Yes' score 1 point

b) What powers has the borough taken?

- Education ☐
- Property Taxation ☐
- Planning & Zoning ☐
- Other ☐
- Specify ______________

c) Community form of government

Home rule city	☐	score 3
First class city	☐	score 2
Second class city	☐	score 1
Other (Specify"________)	☐	no score

d) If community is not in an organized borough, what powers has it taken?

- Education ☐
- Property Taxation ☐
- Planning & Zoning ☐
- Other ☐
- Specify ______________

Source: State of Alaska, Department of Community & Regional Affairs.

13. Community Taxation -

a) Does the community have a bond rating? Yes ☐ No ☐

If 'Yes', score 2 points

b) For communities with bond rating, what is the rating? AA ☐ A ☐ Other ☐

For 'AA', score 1 point

Source: Alaska Bond Bank

14. Community Accessibility & Transportation - Road Access

If the community is accessible to Anchorage by road, for how many days during the past five years was the road impassable due to weather conditions?

_____days

Scoring:

0 - 25 days,	3 points
25 - 50 days,	2 points
51 - 100 days,	1 point
101+ days,	no score
Not applicable,	no score

Source: State of Alaska, Department of Highways

15. Scheduled Air Access - if the community is served by regular scheduled air services, for how many days in the past five years was the scheduled air service unable to take place due to bad weather conditions?

_____days

Scoring:

0 - 20 days,	3 points
21 - 50 days,	2 points
51 - 100 days,	1 point
101+ days,	no score
Not applicable,	no score

Source: U.S. Government, Federal Aviation Agency, Local FAA Service Station

16. Non-scheduled air access - if the community has air accessibility but is not served by scheduled air services, for how many days during the past five ears was all air access impossible due to weather conditions?

_____days

Scoring:

0 - 10 days,	3 points
11 - 20 days,	2 points
21 - 50 days,	1 point
51+ days,	no score
Not applicable,	no score

Source: U.S. Government, Federal Aviation Administration, Federal Service Station or Management of Bush Plane Service that serves the community.

17. Passenger Transportation Cost to Community

Single, economy air fare to Seattle $________

If equal to or less than Anchorage - Seattle fare ($________), score 4 points
If up to $50 greater, 3 points
If $51 - $100 greater, 2 points
If $101 - $200 greater, 1 point
If $201 greater or more, 0 points

Source: Airlines & bush plane carriers serving community.

18. Transportation costs for goods to community

What is the cost of transporting 100 lbs. of goods from Seattle . . .

a) by air $________
If less, equal to or no more than $50 greater than Anchorage rate ($________), award 2 points

b) by water $________
If less, equal to or no more than $50 greater than Anchorage rate ($________), award 2 points

c) by land $________
If less, equal to or no more than $50 greater than Anchorage rate ($________), award 2 points

Source: Commercial transportation companies.

19. Construction Costs - What is the average square foot residential construction cost for this community?

$________ per sq. ft.

If less than or equal to Anchorage cost ($________ per sq. ft.), score 2 points

Source: Major construction companies or construction consultants.

20. Regional Housing Authority - Is there a regional housing authority active in the area where the community is located?

yes ☐
No ☐

If 'Yes', score 1 point

Source: U.S. Department of Housing & Urban Development, Area Office.

21. Land Status & Availability - How much of the following types of land is available in the community and is suitable for development? (Suitable for development refers to safe, secure, dry & utility accessible)

Private Land total	________ acres
Developed/Undeveloped	______ / ______ acres
Zoned Residential	________ acres
Zoned Commercial	________ acres
Unzoned	________

21. land Status &Availability (continued)

Scoring:

a) If private residentially zoned land
- 25 - 50 acres, score 1 point
- 51 - 100 acres, score 2 points
- 101+ acres, score 3 points

c 1

b) If private commercially zoned land
- 25 - 50 acres, score 1 point
- 51 - 100 acres, score 2 points
- 101+ acres, score 3 points

c) If private land is unzoned
- 50 - 100 acres, score 1 point
- 101 - 200 acres, score 2 points
- 201+ acres, score 3 points

Source: State of Alaska, Division of Lands.

22. Land Status & Availability - How much public land is available in the community and suitable for development?

Total public land available & suitable for for development ____________ acres

Scoring:
- 25 - 50 = 1
- 51 - 100 = 2
- 101+ = 3

n

Source: State of Alaska, Division of Lands

23. Education - Does the community have the following education programs & separate facilities?

Program	Sep. Facility	#Students	#Teachers	Design Cap.	
Kindergarten		/			
Elementary School					
Junior High School					
Senior High School					
Further Education (e.g. Community College)					

Scoring: Where community has separate facility for program award 2 points. (Wherever faci 1 ity is combined facility, e.g. Junior/Senior High School, award points only for number of facilities, e.g. Junior/Senior High school = 2 points, not 4)

Source: School District Offices, Borough or Rural Education Attendance Area (REAA). For Further Education, University of Alaska, Community College Extension Service.

24. Do the existing facilities have excess capacity?

Program	#Students	Facility Capacity	% above or below +/-
Kindergarten			
Elementary			
Junior High School			
Senior High School			
Further Education			

Scoring:

For each program compare actual numbers of pupils with facility capacity. If actual number is equal to or less than 10% below capacity, score 2 points. Where program facilities are combined, combine figures & generate one score per facility.

Source: School District Offices, Borough or REAA. For Further Education, University of Alaska, Community College Extension Service.

25. Is the school administration (i.e. superintendent's office) located within the study community?

yes
No

If 'Yes', score 2 points

Source: School District Offices, Borough or REAA

26. Does the school administration have documented projections of number of students expected in this community for the next five years?

yes
No

To check 'Yes' researcher must actually see document.
If 'Yes', score 3 points.

Source: School District Offices, Borough, or REAA.

27. Does the school administration have documented projections of facilities requirements (i.e. a facilities plan) for this community for the next five years?

yes
No

To check 'Yes', researcher must view document.
If 'Yes', score 3 points.

Source: School Administration Offices, Borough or REAA

28. What proportion of school administration proposals to school board were passed by the board in the last 2 years?

# Admin. Proposals	# Passed by Board	% Passing

If % passing is 66% or greater, award 2 points.

Source: School Administration Offices, Borough or REM and School Board Minutes.

29. What proportion of School Board members have at least completed high school?

# School Board	# Completed H.S.	% Completed H.S.

If 75% or greater, score 2 points

Source: School Board Office

30. What is the average" (mean) period of serivce for school board members?

years ______ months

If the average is 3 years or more, score 2 points

Source: School Board Office

31. Has any difficulty been encountered in recruiting persons to sit on school board? For example, has any school board position remained vacant for more than the statutory 30 days in the last 5 years?

Yes ☐
No ☐

If' 'No', score 1 point

Source: School Board Office

32. Has there been new capital expenditure on educational facilities for this community in the last five years?

Yes ☐
No ☐

If 'Yes', score 3 points

Source: School Administration Offices, Borough or REAA

33. Has the school budget for this community shown a consistent increase in special funding over the past 5 years?

Yes ☐
No ☐

If 'Yes', score 2 points

UTILITIES

For all questions relating to utilities source of information is Alaska Public Utilities Commission (APUC) where utility is regulated by them, or Utility Manager unless otherwise stated. APUC regulates all private utilities, public utilities that gross less than $25,000 annually, and municipal utilities that are in competition.

34. Does the community have its own electrical power utility (i.e. utility established to serve this community)?

Yes ☐
No ☐

If 'Yes', score 2 points

35. Is the power utility an independent unit, or part of a larger system (e.g. AVEC)? Independent ☐ Part of a larger system ☐ If 'Independent', score 1 point	☐
36. Is planning and management of the utility carried out in the community? Yes ☐ No ☐ If 'Yes', score 2 points	☐
37. Does the electric utility have plans prepared that predict demand for the next 5 years? Yes ☐ No ☐ To check 'Yes' researcher must view document; If 'Yes', score 3 points Best source: Utility Manager	☐
38. Has there been any increase in generating capacity in the last 5 years? Yes ☐ No ☐ If 'Yes', score 2 points	☐
39. Either: Has an electric utility bond been passed in the community in the last 5 years? (Public Utility) Yes ☐ No ☐ Or: Has the utility received expansion funding from REA or EDA in the last 5 years? (Private Utility) Yes ☐ No ☐ If 'Yes' to either, score 2 points	☐
40. Has the utility received Native Corporation funding or Village Corporation funding in the last 5 years? Yes ☐ No ☐ If 'Yes', score 1 point	☐
41. Has the electric utility operated without loss over the past 5 years? Yes ☐ No ☐ If 'Yes', award 1 point	☐

42. What proportion of community homes have power supplied by the utility? _____% To calculate proportion, express number of homes served by utility as a percentage of total number of dwelling units in community (from Community Information). Score: If proportion of community homes served is 90% or greater, score 1 point	☐
43. Howmany hours of power failure or breakdown have there been in the last 12 month period? _____hours Score: 0 - 10, score 5 points 11 - 20, score 4 points 21 - 50, score 3 points 51 - 100, score 2 points 101+ no score	☐
44. Does the local system have excess generating capacity? yes ☐ No ☐ Check 'Yes' if firm capacity is at least 5% greater than previous peak demand. If 'Yes', award 3 points	☐
45. Could the existing power utility structure/building accommodate another generator? Yes ☐ No ☐ If 'Yes', award 3 points	☐
46. What is the average length of time from ordering to receiving major electrical equipment from outside of Alaska? _________months If less than 6 months, score 2 points	☐
47. What is the normal mode of transportation for major electrical utility equipment to this community? Barge ☐ Road ☐ Air ☐ Score 1 point for road.	☐
48. Ooes the community have its own telephone utility (i.e. utility established to specifically serve this community? Yes ☐ No ☐ If 'Yes', score 2 points	☐

49. Is the telephone utility an independent unit or part of a larger system?

Independent ☐

Part of larger system ☐

If 'Independent', score 1 point

50. Is planning and management of the utility carried out in the community?

Yes ☐

No ☐

If 'Yes', score 2 points

51. Does the telephone utility have plans prepared that predict demand for the next 5 years?

yes ☐

No ☐

To check 'Yes' researcher must view document.
If 'Yes', score 3 points

52. Has there been any expansion of the telephone utility in the last 5years (e.g. new building, new switch gear)?

Yes ☐

No ☐

If 'Yes', score 2 points

53. Either: Has a telephone utility bond been passed in this community in the last 5 years? (Public Utility)

Yes ☐

No ☐

Or: Has the telephone utility received funding from REAor EDA in the last 5years? (Private Utility)

Yes ☐

No ☐

If 'Yes' to either, score 2 points

54. Has the telephone utility received Native Corporation funding or Village Corporation funding in the last 5 years?

Yes ☐

No ☐

If 'Yes', score 1 point

55. Has the telephone utility operated without loss over the past 5years?

Yes ☐

No ☐

"If 'Yes', score 1 point

56. What proportion of community homes have a telephone? (i.e. number of residential main stations) ______% To calculate proportion, express number of homes served by utility (number of residential main stations) as a percentage of total number of dwelling units in community (from Community Information). Score: If porportion of community homes served is 50% or greater, award 1 point	☐
57. How many orders for telephone service are currently on hold? (i.e. requested but no supplied) ______N. If N is 5% or less of the number of community dwelling units, award 2 points	☐
58. How many trouble tickets/complaints were received by the telephone utility in the last 12 months? ______N. If N is 30% or less than number of community residential main stations, award 2 points	☐
59. Could the existing switch gear accommodate a 10% increase in number of main stations? Yes ☐ No ☐ If 'Yes', award 3 points	☐
60. Could the existing facility/building accommodate a 10% expansion of switch gear? yes ☐ No ☐ If 'Yes', score 2 points	☐
61. What is the average waiting time for a telephone hook-up once the order has been placed? ______months If less than one month, score 2 points	☐
62. What is the average length of time from ordering to receiving major telephone utility equipment from outside of Alaska? ______months If less than 6 months, score 2 points	☐
63. What is the normal mode of transportation for major telephone utility equipment to this community from outside Alaska? Barge c 1 Road c 1 Air c 1 Score 1 point for 'Road'	☐

HEALTH

For health service questions, source of information is relevant Health Systems Agency unless otherwise specified.

64. Is there a formally established health administration and/or planning unit for this community (e.g. HSA sub area council, local health powers)?

Yes ☐
No ☐

If 'Yes', score 1 point

m

65. Is there a health plan specifically for this community?

Yes ☐
No ☐

If 'Yes', score 1 point

66. If response is 'No' to Q. 64, is there any community group or organization currently involved in identifying community health needs and health service problems?

yes ☐
No, ☐

If 'Yes', score 1 point

67. Is there any proposal for a new health program or facility for this community that is currently being reviewed?

Yes ☐
No ☐

If 'Yes', award 2 points

68. Has there been any new health program or facility started with public funds (i.e. from federal or state government) in the last 5 years?

Yes ☐
No ☐

If 'Yes', score 2 points

69. How many health professionals are currently practicing and resident in this community? (Count all physicians, dentists, physician's assistants, RNs, LPNs, CHAs, psychologists and other specialists, but do NOT count itinerant health professionals)

_______ N.

Scoring: If N is
2 - 5, score 1
6 - 10, score 2
11 - 15, score 3
16 - 20, score 4
21+, score 5

0. Has there been an increase in the number of health professionals practicing in the community over the past 5 years?

Yes ☐
No ☐

If 'Yes', score 1 point

Section B:

Data to be Collected from Identified Sources Within the Study Community

The items included in this section require data that is not likely to be available from official sources outside of the community and is most likely to be known by knowledgeable people within the community. For many of the questions the answer will be a matter of common knowledge or observation, such as whether the community has a bank or a dock and whether it has road access to Anchorage. For many of the items, the smaller the community, the easier it will be to obtain the data, for example, in a small community it will be relatively easy to count the number of dwelling units.

Some of the community questions may not be applicable to all study communities: where a particular community is served by a single bush telephone, the questions relating to the telephone utility will not be appropriate. In such cases the question should be marked 'not applicable' (NA) and no score should be given.

Where the scoring of particular questions requires comparison with Anchorage rates the researcher should ascertain these immediately before or after the visit to the study community so that rate changes will not interfere with the scoring.

Those questions relating to utilities in Section B are those that we considered could be best responded to within the study community. It may be, however, that in a small community there will be no local utility manager, only an operator. If the local utility personnel are unable to answer any of the questions they should be referred to the utility management, wherever it may be located.

COMMUNITY RESPONSE PROFILE
SECTION B:
Data to be collected from identified sources within the study community

Name of Study Community ______

Period of Data Collection __/ __/ __ to __/ __/ __

Data collected by (list) ______

1. What form of government does this community have. Home rule city ☐ First Class city ☐ Second Class city ☐ Village Council ☐ IRA Council ☐ Other (Specify ______.) Source: Community Officers	No Score
The purpose of question 1 is to identify the source for many of the following questions. For cities, the city manager will be the source for much of what follows, for villages the village council chairman would be identified as source.	
2. Does the community government have a planning section or employ any planners? yes. ☐ No ☐ If 'yes', score 2 points Source: City manager or other community officer.	☐

3. Does the community have a Chamber of Commerce? Yes ☐ No ☐ If 'yes', score 2 points. Source: City/Community Officers	☐
4. Does the community have a bank? Yes ☐ No ☐ If 'yes', score 3 points Source: City/Community Officers	☐
5. Does the community have a Savings & Loan Company? yes ☐ No ☐ If 'yes', score 2 points Source: City/Community Officers	☐
6. Does the community have a local builder/contractor? Yes ☐ No ☐ If 'yes', score 3 points Source: City/Community Officers	☐
7. Is there a bonded or bondable contractor in the community? Yes ☐ No ☐ If 'yes', score 3 points Source: Local contractor(s)	☐

ł. Is there a building materials supply outlet in the community? Yes ☐ No ☐ If 'yes', score 2 points , Source: Chamber of Commerce or Contractors	☐
). Is there a realtor or real estate office in the community? Yes ☐ No ☐ If 'yes', score 2 points Source: Chamber of Commerce or community offices	☐
). Does the community have at least one of each of the following? Yes No Certified electrician ☐ ☐ Plumber ☐ ☐ Heavy equipment operator ☐ ☐ Scoring: For each 'yes', score 1 point Source: Contractors or city/community officers	☐ ☐ ☐
l. Does the community have at least one bookkeeper/accountant for auditing retail operations? Yes ☐ No ☐ If 'yes', Score 1 point Source: Chamber of Commerce or Retail Store Owners/Managers	☐

2. Is there a zoning ordinance in effect for this community? Yes ☐ No ☐ If 'yes', score 2 points Source: Community offices	☐
3. What is the average cost per acre of undeveloped residential land in this community? $________per acre To calculate a score: If a range of prices is given take the midpoint. Then if this figure is less than or equal to Anchorage rate ($per acre), score 2 points Source: Realtor or contractor or community offices	☐
4. What is the average cost per square foot of undeveloped commercial land in this community? Score: If average is less than or equal to Anchorage rate ($ per sq. ft.), score 2 points Source: Realtor or contractor or community offices	☐
5. How much commercial/professional office space currently exists in the community? $________sq.ft. If greater than 5,000 sq. ft., score 2 points Source: Realtor or office space owners	☐
6. How much commercial/professional office space is currently vacant? ________sq.ft. If vacant space is 5-10% of total (given in Q 15) and at least 2,500 sq. ft., award 2 points Source: Realtor or office space owners	☐

'. What is the average rental cost for office space per square foot?

$__________per sq. ft.

If equal to or less than Anchorage average ($__________ per sq. ft.), score 2 points

Source: Realtors or Office Space Owners

}. Is a sales tax currently being levied in this community?

Yes ☐
No ☐

If 'Yes', score 2 points

Source: City/community officers.

1. Is this community currently levying either genera' obligation or revenue bonds?

	Yes	No
a) General obligation	☐	☐
b) Revenue	☐	☐

If 'Yes', score 2 points. Score separately for.' 2 parts.

Source: City/community officers

). Is this community accessible from Anchorage by road?

Yes ☐
No ☐

If 'Yes', score 3 points

Source: City/community officers.

.. Is this community served by regular scheduled commercial air service?

Yes ☐
No ☐

If 'Yes', score 2 points

Source: Local airport, airline offices

!. If 'Yes' to Q. 21, what is the average number of scheduled flights to this community each week?

____

Score:

1 - 4 = 1
5 - 9 = 2
10+ = 3

Source: Local airport, airline offices

3. If 'No' to Q. 21, is community air accessible? (Does it have an airstrip or float/ski plane basin? Is it served by bush planes?) Yes ☐ No ☐ If 'Yes', score 1 point Source: Community officers.	☐
'4. Are bush-plane services operating from this community? (i.e. bush plane service based here) Yes ☐ No ☐ If 'Yes', score 1 point Source: Bush plane operators	☐
'5. Is the community served by the Alaska Marine Highway System? yes ☐ No ☐ If 'Yes', score 2 points Source: Community offices or Harbor Master	☐
'6. Is there a water-borne freight service? (i.e. barge or cargo service by water - river or sea) Yes ☐ No ☐ If 'Yes', score 2 points Source: Community offices or Harbor Master	☐
?7. If 'Yes' to Q. 26, how frequent is the water-borne freight service? ________ times per annum. Scoring: 1 = 0 points 2 - 5 = 1 point 6 - 11 = 2 points 12 - 23 = 3 points 24+ = 5 points On request/as needed = 1 point Source: Harbor Master or Barge Company	☐
28. Does the community have a dock? Yes ☐ No ☐ If 'Yes', score 1 point	☐

29. For how many months per year on average is the port ice-free?

______ months

Scoring:

Less than 8 months = 0
8- 9 months = 1
10- 11 months = 2
12 months = 3

Source: Harbor Master or Barge Company

30. What is the normal method for transporting heavy goods to this community from Seattle?

Entirely by land ☐
Entirely by Water c 1
Combination land/water ☐
Other (Specify________________________)

What is the average length of time for goods in transit from Seattle?

______ weeks/days

Scoring: If four weeks or less, score 2 points

Source: Local merchants

31. Is the following equipment available for construction use in the community?

	Yes	No
D8 or similar earth moving machinery	☐	☐
Back Hoe	☐	☐
Cement Mixer	☐	☐

Scoring: For each 'Yes', score 1 point

Source: Contractor or Community offices

32. What is the dwelling unit occupancy rate for this community?

Number of d.u.s	Total Population	Occupancy Rate
______	______	______

Calculation & Scoring: First ascertain the total number of dwelling units in the community. Then take the total population figure from Section A. Divide total population by number of dwelling units to give occupancy rate. If occupancy rate is 3.1 or less, award 2 points.

Source: City/community officers. If no dwelling unit total is available, visual survey may be necessary

33. How many community dwelling units lack basic facilities (water, sewer, electricity) and/or are in very poor condition?

______

Scoring: If the number given is 15% or less of total number of dwelling units, score 2 points

Source: City/community offices or may require visual survey.

34. What is the vacacy rate for dwelling units that are not substandard (i.e. not included in response to Q. 33)?

______ %

Calculation: Divide number of vacant standard units by total number of standard units and express as percentage.

Scoring: If rate is 5% or greater, award 2 points

C 1

Source: City/community Officers, Realtor of Post Office

35. Has there been any residential development in the community in the last 5 years? That is to say, how many new dwelling units have been added to the housing stock through construction in the last 5 years?

______

Scoring: If 5 units or more, score 3 points

Source: Contractor, Realtor, Community Officers

36. Have any new modular units or trailer/mobile homes units been introduced into the community in the last 5 years?

Yes ☐
No ☐

If 'Yes', how many? ______

Scoring: If 5 units or more, score 3 points

Source: Contractor, Realtor, Community Officers

37. What is the cost of a standard home in this community?

$ ______

Scoring: If figure is no more than 20% greater than figure for standard (comparable) home in Anchorage, ($______), score 2 points

Source: Realtor, Contractor

38. What proportion of homes in the community are financed by Individual private mortgages (i.e. through bank, credit union, saving and loan, NOT H.U.D., V.A. ASHA or other public financing).

_______%

Scoring: If 20% or greater, score 2 points

Source: Realtor, Bank, Contractor

39. Does the community have a preschool/headstart program?

Yes ☐
No ☐

If 'Yes', score 2 points

Source: School Principal

40. What additional funds have been requested for special programs (including those mandated) during the last 3years? Did you succeed in obtaining funding for these programs?

Program	Check if Funded
____________	☐
____________	c 1
____________	c 1
____________	c 1
____________	c 1

Scoring: Award 1 point for each program requested, 1 point for funding

Source: School Principal(s)

41. What new programs or course offerings are you planning to introduce in the next few years?

List new programs/course offerings:

____

____

____

____

Scoring: Award 1 point for each planned offering.

Source: School Principal (s)

42. Has any teaching position in this community remained vacant for more than 6 months in the last 5 years.? Yes Cl No ☐ If 'Yes', award 3 points Source: School Principal(s)	☐
43. What has been the average length of stay for teachers who have taught in this community during the past 5 years? ________year/months Calculation: obtain list of all teachers employed in the community during past 5 years. Ascertain length of employment as teacher in community for each. Add the figures together and divide by number of teachers. Scoring: If 18 months or greater, score 3 points Source: School Principal (s)	☐
44. Does the community power utility have a stand-by generator adequate to supply summer demand, so that main generator(s) can be overhauled? Yes ☐ No ☐ If 'Yes', score 2 points Source: Local Utility Manager/Operator	☐
45. "Has the local generator(s) been overhauled in the last 15 months? Yes ☐ No ☐ If 'Yes', score 1 point Source: Local utility manager or utility employee	c 1
46. What is the average waiting time for an electric power hook-up? ________ weeks If less than 5 weeks, score 2 points *Source:* Local utility employees, contractor	☐
47. How many people are currently employed in the *community* by the power utility? ________ Scoring: 1 = 0 2 - 4 = 1 5- 10 = 2 11+ = 3 Source: Local utility manager or employees.	☐

8. What is the average length of time in position for utility operators over the last 5 years? (Utility operator = personnel who operate and maintain generating equipment)

_______ months

If 18 months or greater, score Z points

Source: Local Utility Manager

. What has been the vacacy rate for operator positions over the past 5 years?

_______ %

Calculation & Scoring: Ascertain total number of employment months possible in last 5 years (e.g. 1 operator = 12 x 5 = 60 months, 2 operators 12 x 5 x 2 = 120 months, etc.). Ascertain months of vacancy (e.g. 1 operator position, 2 months = 2, 2 operator positions 4months = 8, etc.). - Divide number of vacant months by total employment months to get rate. If rate is less than 10%, score 2 points

Source: Local Utility Manager

D. How many employees does the telephone utility have here in the community?

____

Scoring: "

1 = 0 points
2 - 4 = 1 point
5-1o = 2 points
11+ = 3 points

Source: Telephone Utility Local Manager

51. What is the average length of time in employment with the telephone utility for current employees?

_______ months

If 18 months or longer, score 2 points

Source: Telephone Utility Local Manager

52. What has been the vacancy rate for telephone utility positions over the last 5 years?

____

(For calculation, see Q. 49)

Scoring: If rate is less than 10%, score 2 points

53. How many retail stores are there in this community?

____

Scoring:
- 0 - 1 = 0 points
- 2 - 5 = 1 point
- 6 - 10 = 2 points
- 11+ = 5 points

Source: Chamber of Commerce or Visual Survey/Count

54. How many of the retail stores are branch stores of a larger group (e.g. Sear's, N.C. 's)?

____

If 2 or more, score 1 point

Source: Retail Store Managers

55. What is the average length of operation for the retail stores in this community?

________ years/months

Calculation & Scoring: Add length of operation for each retail outlet, divide by number. If resulting figure is 5 years or greater, score 2 points

Source: Chamber of Commerce, or may require survey of owners, managers.

56. Is shelf space in the retail stores fully occupied or are shelves empty?

Shelves full ☐

Shelves empty ☐

Score 1 point for 'Shelves empty'

Source: Visual scanning of retail stores

57. Do retail stores have vacant unused warehouse/storage space?

Yes ☐
No ☐

If 'Yes', score 1 point

Source: Retail Store Owners, Managers

58. Are existing retail stores open for business regular hours and at least 40 hours per week?

Yes ☐
No ☐

If 'No', score 2 points

Source: Retail store owners, managers

59. Has any individual or group carried out a marketing feasibility study in the last 5 years in this community?

Yes ☐
No ☐

If 'Yes', score 2 points

Source: Chamber of Commerce, Retail owners, managers

60. Has there been any increase in the number or size of retail stores in the past 5 years?

Yes ☐
No ☐

If 'Yes', score 3 points

Source: Chamber of Commerce, Retail owners, managers

61. If 'Yes' to Q. 60, was the expansion/opening based on a feasibility study?

Yes ☐
No ☐

If 'Yes', score 1 point

Source: Relevant retail owners, managers

62. Has any retail outlet in this community successfully developed a proposal to obtain funding from an outside public source in the last 5 years? (e.g. Small Business Administration (SBA), Economic Development Agency (EDA)

Yes ☐
No ☐

If 'Yes', score 3 points

Source: Chamber of Commerce, Retail owners, managers

63. What is the average length of time in position for the store managers (or owner/managers) in this community?

_______ years

Calculation & Scoring: Add together figures for each one and divide by number. I"f resulting figure is:

18 months - 3 years,	score 1 point
3years & one month - 5 years,	score 2 points
5 years & one month upwards,	score 3 points

Source: Retail owners & managers

64. Has there in the last 5years been any period of 3 months or longer when the position of store manager in any of the retail outlets has been vacant?

yes ☐
No ☐

If 'No', score 1 point

Source: Retail owners, managers

65. Has any local bank or financial institution made a loan for commercial development in this community in the last 5 years?

Yes ☐
No ☐

If 'Yes', score 3 points

Source: Managers, local financial institutions

66. Has any retail store in this community received private financing from outside the community in the last 5 years? (e.g. funding from Anchorage bank or funding from group for branch store)

yes ☐
No ☐

If 'Yes', score 1 point

Source: Retail owners, managers

67. Where do retail grocery stores order most of their supplies from:

Anchorage O "
Fairbanks ☐
Juneau ☐
Seattle ☐

What is the normal time-lag between ordering & receiving retail goods?

_______ weeks

If less than 6 weeks, score 3 points

Source: Grocery store managers

68. What would be the cost of transporting 100 lbs. of general retail goods to this community from Seattle to arrive in less than 6 weeks?

$__________

If less than, equal to or no more than $15 greater than Anchorage rate ($__________), score 3 points

Source: Retail store owners, managers or transport companies

69. Does the community have the following health professionals?

	Yes	No
Physician/Doctor (General)	☐	n
Dentist	☐	n
Registered Nurse	☐	0
Community Health Aid	☐	0
Alternate Community Health Aid	☐	n

Scoring: If 'Yes', score 3 points for doctor, dentist; 2 points for RN; 1 point for CHA & alternate

Source: Local health personnel or city/community officers

70. List any other health professions represented (practicing) in community (N.B. do not include itinerant specialists here).

____

____

____

____

Scoring: Award 1 point for each profession/specialty

Source: Local health personnel

71. Does the community have . . .?

	"Yes	No
A health clinic	☐	☐
X-ray equipment	☐	☐
Community Mental Health Center	☐	o
Acute Inpatient beds(hospital)	☐	☐
Mobile EMT capacity (ambulance or equipped plane)	☐	0

Scoring: For each 'Yes', score 1 point

Source: Local health personnel

72. If the community has inpatient beds (hospital), what is the average occupancy rate for inpatient beds?

_______ %

If less than 50%, score 3 points

Source: Hospital Administrator

73. Is the physician/patient ratio less than 1:2,500 where there are at least 2 physicians in the community?

Yes ☐
No ☐

If 'Yes', score 3 points

74. Is the dentist/patient ratio less than 1:3,000?

Yes ☐
No ☐

If 'Yes', score 1 point

Source: Local dentists

75. Has there been any new health facility or program introduced in this community in the last 5 years?

Yes ☐
No ☐

If 'Yes', score 3 points

Source: Local health personnel

76. What is the average length of service in this community for health professionals who have practiced here in the last 5 years?

years/months

Calculation & Scoring: Compile a list of all resident health professionals practicing in community in last 5 years and note how long they practiced here. Add and then divide by number. If resulting figure is

18 months - 3 years,	score 1 point
3.1 - 6 years,	score 2 points
6,1 - 10 years,	score 3 points
11+ years,	score 4 points

Source: Local health personnel

"77. Has any health position in the community been vacant for more than 6 months in the last 5 years?

Yes ☐
No ☐

If 'No', score 2 points

Source: Local health personnel

78. Have any new, private medical practices been established in the community in the last 5 years (i.e. has there been an increase in the number of private medical practices, such as doctors, dentist)?

Yes ☐
No ☐

If 'Yes', score **2 points**

Source: Local health personnel

79. Does the community government provide incentives for promoting or attracting private medical services? (e.g. subsidy for professional center, free office, clinic space)

Yes ☐
No ☐

If 'Yes', score 2 points

Source: Mayor, City Manager, Community Officers, Health Personnel

80. Is there reliable & regular transportation to a full range of medical services (i.e. Anchorage, Fairbanks Seattle)?

Yes ☐
No ☐

If 'Yes', score 2 points "

Source: Local health personnel

81. Is there regular & reliable communication (telephone, radio, radio telephone) with full range of health services?

Yes ☐
No ☐

If 'Yes', score **3 points**

Source: Local health personnel

82. On how many days during the last year was communication (telephone, radio, radio telephone) with full range of health services impossible?

________ days

Scoring:
0 - 5 days, 3 points
6 - 30 days, 2 points
31 - 60 days, 1 point
61+ days, no score

Source: Local health personnel

83. Is a full range of health services within 45 minutes transportation time by emergency methods (chartered bush plane, helicopter, ambulance)?

Yes ☐
No ☐

If 'Yes', score 3 points

Source: Local health personnel, transport personnel, airlines, bush plane operators

SECTION C: Data to be collected by Survey Research within the Study Community

Section C consists of only four questions: all items that could not be obtained by other means. One of the questions, relating to length of residence in the community is already included in the questionnaire designed for the Individual Change component of this study. The remaining questions relate to unemployment, housing finance and medical insurance. Measures of unemployment reflect the economic viability of the study community as well as providing data regarding the available work force for service development. Responses to the housing finance question will provide an indicator of the strength of the private housing market in a community. The extent of private medical insurance in a community is a measure of the scope for development of private medical services.

Questions of sample size and of administration of the survey questions in the study communities are dealt with in Chapter VI.

COMMUNITY RESPONSE PROFILE

SECTION B:

Data to be Collected by Survey Research Within the Study Community

Name of Study Community ______________________

Period of Data Collection _/' ____/__ to __/__/__

Data Collected by (list) ______________________

____

____

____

1. Average length of residence in the community. (Question A10 Individual Change Component Community Baseline Survey). How long have (you/head) lived in this community? ________ years/months Scoring: If average (mean) length of residence as computed from the survey results is 5 years or greater, score 2 points	☐
2. What proportion of the community were unemployed but seeking work during summer months of previous year? ________ % Survey Question: Were you or was anyone else in your household unemployed but seeking work during the months of July, August & September of this (last) year? Scoring: If results show that proportion of community population unemployed but seeking work was 10% or less, score 2 points	☐
3. Proportion of Community Homes financed through private mortgage. ________ % Survey Question: Dc you own this house, are you renting, or what? (For those who respond ' own') When you bought this home how was it financed? Did you obtain a loan from a bank, a savings and loan company, a mortgage company, a government agency, or from some other source? Scoring: If survey results show 20% or greater proportion of owned homes financed through private mortgage, score 2 points	☐

3. What proportion of community population have private medical insurance?

_______ %

Survey Question:

If you or your family needed medical care today, which of the following ways would you use to cover the cost?

a) Own insurance

b) Employer - or union - provided insurance

c) Indian Health Service coverage
. (or other federal programs for Alaska Native)

d) Military coverage

e) Medicare

f) Medicaid

g) Veterans' Administration coverage

h) Other state or federal programs

i) Out of pockey money

j) Other (specify)

Scoring: If 50% or more of community population have private medical insurance (a or b), score 2 points

USE OF FIELD INSTRUMENT

The field instrument is designed to be used to compare a number of communities, each of which might be considered as the location for a particular OCS development onshore facility. Use of the instrument is based on the assumption that the communities have already been assessed for geological and ecological aspects and no significant differences exist, therefore, consideration of their likely social and economic response to the siting of an OCS facility becomes a relevant concern. Under these circumstances the Community Response Profile could be completed for each of the possible locations in order to predict which community has services that demonstrate the greatest capacity for responding to the increased service demand that would accompany the OCS response siting.

The comparative assessment provided by the response profile refers only to the ability of community services to respond to generalized increased demand, it has no specific OCS project aspects built into it. The Community Response Profile is a comparative tool intended to differentiate between communities. When the Community Response Profiles have been completed for several communities the resulting scores can be compared in order to decide which community has the greatest capacity for service response. The overall scores can be compared in order to decide which community has the greatest capacity for service response. The overall scores can be used to rank the communities in order of service capacity to respond. The overall score for a single community has no inherent meaning when taken alone: the number is intended as a comparative measure. Scores can also be compiled for each of the specific services studied. For each community studied seven scores can be obtained from the Community Response Profile:

- A general community score
- A housing response capacity score
- A school response capacity score
- An electric utility response capacity score
- A telephone utility response capacity score
- A retail trade response capacity score
- A health services response capacity score

Each of these scores can be used comparatively across communities. The individual service response capacity scores can be used to identify a service that is weak in response capacity in any specific community. The general community score is based only on general items and items relating to the six specific services studied. It tells us nothing about response capacities for services that were not studied. It is likely, however, that if the services we have studied in a particular community have a limited response capacity other services in the same community will also be hampered by the same factors that have hampered the services we have studied, such as lack of skilled human resources or lack of private capital. Similarly, in communities where response capacity for the services that we have studied is high, it is likely that other services that we have not studied will benefit from the same factors and will also have high response capacity.

THE SCORING SYSTEM

The method of scoring used for the Community Response Profile is a simple additive points system. The point system was developed after consultation with persons experienced in community service delivery, as described in Chapter 2. To obtain any score, points arising from Sections A, B, and C of the Community Response Profile must be aggregated. The scoring system provides us with a general community response score and six service specific scores.

The general community response score is obtained by adding all the points scored by any particular community for all items on Sections A, B and C. Instructions for scoring every item are included on the field instruments. The general community response measure has a potential top score of 415 points. The higher the score obtained by any community, the higher its service response capacity is judged to be. The measure is intended only for comparative use. If the measure is applied to several communities, whichever receives the highest score is judged to be the one whose services will respond best to the increased demand associated with development.

The six specific measures are compiled by aggregating scores for all those items on the Community Response Profile that are related to the particular services. Figure V-1 provides a listing of items for compiling the service measures.

FIGURE V-1

Items for Compiling Service Specific Measures

Service	Items
Housing	A 4d, 9, 10, 14, 15, 16, 17, 18, 19, 20, 21a, 21c B 4, 5, 6, 7, 8, 9, 10, 12, 13, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38. C 3
Schools	A 12a, 12c, 14, 15, 16, 17, 18, 19, 22, 23, 24, 25, 26, 26, 27, 29, 30, 31, 32, 33 B20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 39, 40, 41, 42, 43
Electric Power	A4b, 4d, 13, 14, 15, 16, 17, 18, 19, 22, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46 B6, 7, 10, 15, 16, 17, 19b, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 44, 45, 46, 47, 48, 49
Telephones	A 4b, 4d, 13, 14, 15, 16, 17, 18, 19, 22, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63 B6, 7, 10, 15, 16, 17, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 44, 45, 46, 47, 48, 49
Retail Trade	A4b, 6b, 8, 11, 14, 15, 16, 17, 18, 19, 21 B3, 4, 5, 9, 11, 12, 14, 15, 16, 17, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68
Health	A 14, 15, 16, 17, 18, 19, 22, 64, 65, 66, 67, 68, 69, 70 B 15, 16, 17, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83

The housing response capacity measure has a potential top score of 100 points. The schools, electric power, telephone and retail trade measures all have a potential top score of 120, and the health measure has a potential top score of 125 point. For the service measures", we feel that any community service that scored in the lower third of the score range could be regarded as having a weak response capacity, any service that scored in the middle third of the score range could be regarded as having moderate response capacity and any community service that scored in the top third of the score range could be regarded as having high response capcity. Figure V-2 gives the range of scores for different response capacity levels for each service.

FIGURE V-2

Service Measure Response Capacity

Service	Score Range			Potential Top Score
	Low	Medium	High	
Housing	0-33	34-67	68-100	100
Schools	0-40	41-80	81-120	120
Electric Power	0-40	41-80	81-120	120
Telephone	0-40	41-80	81-120	120
Retail Trade	0-40	41-80	81-120	120
Health	0-42	43-84	85-125	125

Whereas the general community score should only be used comparatively, the service response capacity scores can be used to identify a particular weak service within a community. It is likely, however, that response capacity for different services within the same community will be similar, since " they depend on similar characteristics.

Application of Community Response Profile to Kenai Borough Communities

In order to provide a demonstration of the use of the Community Response Profile it was completed for three potential OCS impact communities on the Kenai Peninsula: Seward, Seldovia and Homer. The demonstration project was carried out during October and November 1978. since the relevant survey of these Kenai Peninsula towns which was used for the Individual Change component of the study was carried out in 1976, we collected all 1976 data for the Community Response Profiles. For a few items 1976 data was not available, in which case we used the contemporary data.

Although the Kenai demonstration was intended to be just to show how the Community Response Profile should be used, it resulted in the major reorganization of the instrument and in the modification of some items. In this chapter, we have presented the Community Response Profile as modified after the Kenai demonstration. However, the scores that we report for the Kenai demonstration were collected using the instrument before it was modified, therefore, the scoring and total possible scores vary slightly from those already given.

Results of Kenai Demonstration

The overall results of the Kenai demonstration are shown in Figure V-3.

FIGURE V-3

Results of Kenai Demonstration

	General Score	Housing	Schools	Electric	Telephone	Retail Trade	Health
Potential Top Score	410	100	115	110	110	120	120
Homer	320	71	98	84	80	83	97
Response Capacity	-	High	High	High	High	High	High
Seldovia	243	65	82	53	60	65	64
Response Capacity	-	Medium	High	Medium	Medium	Medium	Medium
Seward	298	70	92	67	79	78	100
Response Capacity	-	High	High	Medium	High	Medium	High

As the table shows, of the three communities studied, Homer has the greatest overall service response capacity followed by Seward and then Seldovia. All of the six services studied in Homer are judged to have a high level of response capacity. In Seward, the overall response capacity is not quite so high. Housing, Schools, Telephone and Health services are judged to have high response capacity, while Electric Power and Retail Trade are medium. Seldovia has the lowest overall response capacity of the three communities studied. This is in line with our expectations, since Seldovia is less accessible than either Seward or Homer and is a considerably smaller community with less well developed services. In Seldovia, the only community service that ranks high on response capacity is Schools, all others ranking medium. Again, this is in accordance with our expectations, since Education, being a service provided essentially by the State of Alaska, is less subject to the constraints of location experienced by other communities.

Based on our community analysis, we would suggest that, from the point of view of ability to respond to increased demands for services, Homer has the best response capacity of the three communities studied. Each of the services studied in Homer, has a high level of capacity for response to increased demand. If the communities studied were indeed potential sites for OCS onshore facilities, and if all other factors were judged to be equal for these communities, then from the point of view of service response only, Homer would provide the most responsive location. The difference between the communities studied, however, is not great, which is to be expected. If on the basis of other information, Seward or Seldovia were chosen for the facility, then strengthening of the Electric Power Utility and of Retail Trade in Seward would be suggested, and strengthening of all services with the exception of education in Seldovia would be wise.

The general conclusion to be drawn from this brief demonstration is that our Community Response Profile can be used for providing distinctions between potential OCS site communities. Application of the Community Response Profile can also distinguish between the response capacities for different services in a particular community. Our demonstration indicates the potential usefulness of such an instrument, although application of the instrument to a variety of different types of community might lead to its further refinement. Further research to test and refine the instrument would be desirable. The demonstration of its use suggests that it does provide a method of considerable importance in projecting community impacts.

VI. INDIVIDUAL LEVEL CHANGE
FIELD INSTRUMENT AND INSTRUCTIONS

Chapter III presented an analysis of the changes experienced by individual Valdez and Fairbanks residents during the initial construction phase of an energy project. Many of the changes experienced by residents were found to depend on personal characteristics that are held prior to the initiation of the project. Knowledge of these characteristics, therefore, should facilitate prediction of changes that are likely to occur once the energy project is started. By knowing the distribution of these baseline characteristics in a community and the relation they have born to impact changes in other communities such as Fairbanks and Valdez, better projections of change for the community are possible.

This chapter is divided into two primary sections. In the first, a field instrument is presented containing questions on individual characteristics which were found to be predictors of change in Valdez and Fairbanks. Additional questions are also included on other variables that were not available from the Valdez and Fairbanks surveys, but which we have pointed out in our analysis as being likely predictors of change. In addition to the instrument itself, instructions are also given on appropriate sampling, data collection and coding procedures for use of the field instrument. In the second section of this chapter, this methodology is actually applied through the analysis of baseline data collected through prior surveys conducted in the communities of Seward, Seldovia and Homer. Because these surveys were peformed prior to the development of the field instrument, the data does not exactly correspond to that which would be generated with the suggested field instrument. However, the data is sufficiently complete to demonstrate how predictions can be made in each community of those changes which are likely to occur should energy projects be located in them. However, the predictions are made for demonstration purposes only and should not be interpreted as actual predictions of changes which would result from an OCS onshore development. It is also important to note that the value of the research approach is not restricted to the construction of "mechanical" predictive tools; more importantly, the research approach improves our understanding of the process of change. Perhaps this is best illustrated in Figure 3-21.

Field Instrument

The following instrument has been prepared to provide baseline data on individual characteristics of community residents prior to the initiation of an energy project. These characteristics in turn can be used to better predict changes that are anticipated once the project is initiated.

The instrument is primarily intended as a research device that should be subject to continual modification. Future research may test additional predictive relationships that would warrant inclusion of new variables. In addition, refinements might be made in the measures of some variables to better meet local needs and situations. We anticipate that future use and testing of the instruments will generate many such changes. We have included on the instrument only those characteristics which can be used for predicting changes, not measuring change itself. . Hopefully, this will make it easier for the readerto see how questions are used for predictions of change. While we have not included questions which can provide a basis for measuring changes (rather than predicting them) we strongly recommend that all baseline studies include factual self-reports of household income, time spent working for pay, time spent on subsistence, dependence on subsistence goods, ownership of hunting and fishing equipment and current housing conditions.

As further introduction, mention should be made of one apparent complexity in the instrument. Both the head of the household and the spouse of the head (when the head is married) are asked many of the same questions. This is because we are treating the household as a unit and both the head and the spouse of the head are important. We have expanded the employment questions to include the spouse of the head because it probably is desirable to develop predictions of employment changes for both adult household members. The reader will recall that our analysis of employment changes was restricted to the head of the household.

COVER SHEET

COMMUNITY BASELINE SURVEY

Administering Agency	(office use only)

1. Interviewer's Name ____________ 2. Interview No. ________

3. Village ____________ 4. Line Number ________

5. Address (or description) ____________

6. Call Record

	DATE	DAY OF WEEK	WHAT HAPPENED?	INTERVIEWER'S INITIALS
1st visit				
2nd visit				
3rd visit				
4th visit				

7. The purpose of this questionnaire and survey is to provide information which your community and others can use in planning development projects, such as onshore facilities for oil development. Decisions must be made regarding the location of these facilities and for planning those changes that might occur in your community. To do this it is important to know the attitudes and opinions which you and your husband or wife hold. It is also important to know certain facts about your family, occupation and skills in order to know how a possible local petroleum project might effect your lives and those of other community residents.

8. I consent to be interviewed as a part of the study described above. I understand that I may refuse to answer any question in the questionnaire, that what I say will be kept entirely confidential, and that my replies will be used only in combination with those of many others where I live and throughout the region.

____________ ____________

Respondent's signature Date Interviewer's signature

9. Mailing address (where report can be mailed)

Name ____________

Address ____________

10. First, starting with the person who provides most of this household's income, could you tell me who normally lives in this house and how each is related? INTERVIEWER: LIST RELATIONSHIP, AGE AND SEX FOR EACH PERSON.

	RELATIONSHIP OF EACH PERSON TO HEAD	SEX	AGE
PERSONS 18 YEARS AND OVER	HEAD		
PERSONS UNDER 18 YEARS			

INTERVIEWER INSTRUCTIONS: ATTEMPT TO INTERVIEW THE HEAD OF THE HOUSEHOLD, STARTING WITH PAGE 1, QUESTION Al. IF THE HEAD IS NOT AVAILABLE, INTERVIEW THE SPOUSE, STARTING ALSO ON PAGE 1, QUESTION A1. IF THERE IS NO SPOUSE, ARRANGE TO INTERVIEW THE HEAD.

1. HEAD INTERVIEWED

2. SPOUSE OF HEAD INTERVIEWED

SECTION A
PERSONAL CHARACTERISTICS OF HEADOF HOUSEHOLD

A1. What is the highest grade of school or college (YOU/HEAD) have completed?

[1. 0 TO 11 YEARS] [2. 12 YEARS HIGH SCHOOL] [3. 13-15 YEARS] [4. 16 YEARS OR MORE-COLLEGE]

A2. Are (you/HEAD) presently employed, unemployed, retired, a housewife, student or what?

[1. WORKING NOW] [2. UNEMPLOYED LAID OFF] → SKIP TO QA7 [3. RETIRED] → SKIP TO QA9 [4. HOUSEWIFE] [5. STUDENT] [6. OTHER] → SKIP TO QA10

A3. What is (your/HEAD'S) major occupation? ____________________

A4. Who do (you/HEAD) work for? ____________________

A5. How long have (you/HEAD) worked there? ____________________

A6. Would you say that you definitely want to keep the job you have now, that you might consider a job change, or that you would like to change jobs?

[1. KEEP JOB] → SKIP TO QA10 [2. CONSIDER JOB CHANGE] [3. WANT TO CHANGE JOBS]

A6a. Would you be likely to take a job working for an oil company if one were available in your community?

[1. NO] [2. MAYBE] [3. YES]

SKIP-TO QA10

UNEMPLOYEDOR LAID OFF

A7. What is (your/HEAD'S) major occupation? ____________________

A8. Would (YOU/HEAD) be likely to take a job working for an oil company if one were available in your community?

[1. YES] [3. MAYBE] [5. NO]

SKIP*TO QA10

RETIRED

A9. Does your household have a fixed income or does part of your income come from business interests or something else that changes from year to year?

1. FIXED INCOME   2. INCOME CHANGES

CONTINUE WITH QA10

A10. How long have (you/HEAD) lived in this community? ________

A11. HOW long do (you/HEAD) expect to live in this community? ________

A12. Are (you/HEAD) a member of a Native corporation?

1. YES   5. NO

****

INTERVIEWER CHECKPOINT I

☐ RESPONDENT IS THE HEAD OF HOUSEHOLD.

☐ RESPONDENT IS THE SPOUSE OF THE HEAD. ARRANGE TO HAVE HEAD COMPLETE SECTION AND SKIP TO SECTION B.

****

	1. STRONGLY OPPOSED	2. SOMEWHAT OPPOSED	3. MIXED	4. SOMEWHAT IN FAVOR	5. STRONGLY FAVOR
A13a. Looking at the categories on this card (HAND R CARD 1), which category best fits how you feel about locating a supply base for offshore oil development in your community?	☐	☐	☐	☐	☐
A13b. Using the same categories, how to you feel about locating oil pipelines, storage tanks or other oil-related facilities near your community?	☐	☐	☐	☐	☐
A13c. And constructing an oil refinery or oil-base industry in your community?	☐	☐	☐	☐	☐
A13d. And constructing other industrial plants such as a pulp mill or fish processing plant?	☐	☐	☐	☐	☐
A13e. In general, how do you feel about more growth in your community?	☐	☐	☐	☐	☐

	1. NOT AT ALL IMPORTANT	2. NOT VERY IMPORTANT	3. SOMEWHAT IMPORTANT	4. VERY IMPORTANT	5. EXTREMELY IMPORTANT
14a. Now using the categories on this card (HAND RCARD 2), how important is it to you to live in a small, quiet community?	☐	c1	☐	☐	☐
14b. How important is it for you to be able to recognize everyone you see around town?	☐	☐	☐	☐	☐
14c. And to increase the amount of money you make?	☐	☐	☐	☐	☐
14d. To be able to hunt and fish for most of the food your family needs?	☐	☐	☐	☐	n
14e. To have a job that pays a very high salary?	☐	☐	☐	☐	c1
14f. To be self-reliant and not depend on others for building and fixing what you need?	c1	•1	•1	•1	•1
14g. Finally, how important is it to you to have a job that provides long term security and good benefits?	☐	☐	☐	☐	☐

INTERVIEWER CHECKPOINT II

☐ R IS MARRIED AND HEAD → CONTINUE WITH SECTION B.

☐ R IS SINGLE AND HEAD.

A15. Thank you. These are all the questions that I have, except to ask if you would like to receive a copy of the results of this survey. (IF SO, RECORD R'S NAME AND ADDRESS ON THE COVER SHEET)

SECTION B
PERSONAL CHARACTERISTICS OF SPOUSE OF HEADOF HOUSEHOLD

B1. What is the highest grade of school or college (you/SPOUSE) have completed?

[1. 0 TO 11 YEARS] [2. 12 YEARS HIGH SCHOOL] [3. 13-15 YEARS] [4. 16 YEARS OR MORE-COLLEGE]

B2. Are (you/SPOUSE) presently employed, unemployed, retired, a housewife, student or what?

[1. WORKING NOW] [2. UNEMPLOYED LAID OFF] [3. RETIRED] [4. HOUSEWIFE] [5. STUDENT] [6. OTHER]

2. UNEMPLOYED LAID OFF → SKIP TO QB7

3, 4, 5, 6 → SKIP TO QB9

B3. What is (your/SPOUSE'S) major occupation? ____________

B4. who do (you/SPOUSE) work for? ____________

B5. How long have (you/SPOUSE) worked there? ____________

B6. Would you say that you definitely want to keep the job you have now, that you might consider a job change, or that you would like to change jobs?

[1. KEEP JOB] [2. CONSIDER JOB CHANGE] [3. WANT TO CHANGE JOBS]

1. KEEP JOB → SKIP TO QB9

B6a. Would you be likely to take a job working for an oil company if one were available in your community?

[1. NO] [2. MAYBE] [3. YES]

SKIP TO QB9

UNEMPLOYED OR LAID OFF

B7. What is (your/SPOUSE'S) major occupation ____________

B8. Would (you/SPOUSE) be likely to take a job sorking for an oil company if one were available in your community?

[1. YES] [3. MAYBE] [5. NO]

SKIP TO QB9

B9. Are (you/SPOUSE) a member of a Native corporation?

1. YES   5. NO

****

INTERVIEWER CHECKPOINT III

☐ R IS SPOUSE OF HEAD OF HOUSEHOLD

☐ R IS HEAD OF HOUSEHOLD. ARRANGE TO HAVE SPOUSE COMPLETE THIS SECTION AND SKIP TO QB12.

****

	1. STRONGLY OPPOSED	2. SOMEWHAT OPPOSED	3. MIXED	4. SOMEWHAT IN FAVOR	5. STRONGLY FAVOR
B10a. Looking at the categories on this card (HAND RCARD 1), which category best fits how you feel about locating a supply base for offshore oil development in your community?	☐	☐	☐	☐	☐
B10b. Using the same categories, how to you feel about locating oil pipelines, storage tanks or other oil-related facilities near your community?	☐	☐	☐	☐	☐
B10c. And constructing an oil refinery or oil-base industry in your community?	☐	☐	☐	☐	☐
B10d. And constructing other industrial plants such as a pulp mill or fish processing plant?	☐	☐	☐	☐	☐
B10e. In general, how do you feel about more growth in your community?	☐	☐	☐	☐	☐

	1. NOT AT ALL IMPORTANT	2. NOT VERY IMPORTANT	3. SOMEWHAT IMPORTANT	4. VERY IMPORTANT	5. EXTREMELY IMPORTANT
B11a. Now using the categories on this card (HAND RCARD 2), how important is it to you to live in a small, quiet community?	☐	☐	☐	☐	☐
B11b. How important is it for you to be able to recognize everyone you see around town?	☐	☐	☐	☐	☐
B11c. And to increase the amount of money you make?	☐	☐	☐	☐	☐
B11d. To be able to hunt and fish for most of the food your family needs?	☐	☐	☐	☐	☐
B11e. To have a job that pays a very high salary?	☐	☐	☐	☐	☐
B11f. To be self-reliant and not depend on others for building and fixing what you need?	☐	☐	☐	☐	☐
B11g. Finally, how important is it to you to have a job that provides long term security and good benefits?	☐	☐	☐	☐	☐

B12. Thank you. These are all the questions that I have, except to ask you if you would like to receive a copy of the results of this survey. (IF SO, RECORD R'S NAME AND ADDRESS ON THE COVER SHEET.)

Sampling and Administration of Field Instrument

The field instrument, as stated, is intended for administration to the household head and his or her spouse. Care should be taken that on the self-administered attitudinal section, both household head and spouse complete independently their respective sections. Since the instrument is relatively short, simple and,in part, self-administered, a minimal amount of training would be necessary in order to prepare interviewers for conducting the survey. We recommend that local interviewers be used for this purpose. With relatively minor adjustment, the questionnaire could be adapted for total self-administration, thereby avoiding -the necessity of using interviewers. However, the reliability of the employment information may be substantially decreased. In addition, a local coordinator would still be necessary to assure the distribution and return of self-administered questionnaires from those households which were selected for the survey.

The number of households to be sampled for administration of the questionnaire depends on the size of that community. When samples get much below fifty cases, the frequencies on many of the specific age, education and occupational category variables become so low that application of the predictive formulas becomes difficult. For this reason projections are not made in this chapter for the communities of English Bay and Port Graham. The 50 percent and 33 percent samples taken in these communities resulted in the collection of eleven and fourteen cases respectively. In small communities of this size, obviously a total enumeration of all households in the community is necessary.

For larger communities in excess of one hundred families, a sampling of families would be recommended. Even with limited resources, sample sizes of one hundred families are suggested, and bigger samples would be advisable in large communities such as Homer and Kodiak. In all cases where samples are used, a random selection of families should be made. This will obviously necessitate the listing or enumeration of all households and houses in a community.

Coding of Field Instrument

In order to prepare the questionnaire data for use in the predictive formulas, specific coding is necessary. In addition, the motivational variables will have to be constructed from various questions asked in the instrument. Finally, mean scores must be subtracted from certain of the variables prior to their use in the equations. Specifically, the instrument data would have to be prepared using the three procedures which follow.

CONSTRUCTION OF VARIABLES

The motivational variables would have to be constructed through the use of compute statements that combine responses from separate questions. The specific indices to be constructed and the questions on the instrument from which they are developed are listed in Table 6-1.

TABLE 6-1

MOTIVATIONAL INDICES TO BE CONSTRUCTED
R M SEPARATE INSTRUMENT QUESTIONS

Name of Variable Index	Instrument Question Number	Composition of Index
Head's attitude toward growth	QA13a,b,c,d,e	A13a + A13b + A13c + A13d + A13e÷ (5-number of missing responses)
Spouse's attitude toward growth	QB10a,b,c,d,e	B10a + BIOb + B1oc + B10d + B10e÷(5-number of missing responses)
Head's desire for small town living conditions	QA14a,b	A14a + A14b÷(2-number of missing responses)
Spouse's desire for small town living conditions ,	QB11a,b	B11a + B11b÷(2-number of missing responses)
Head's desire for personal economic benefits	QA1 4c, e	A14c + A14e÷(2-number of missing responses)
Spouse's desire for personal economic benefits	QB11c,e	B11c + B11e÷(2-number of missing responses)
Head's desire for self-reliant life style	AQ14d,f	A14d + A14f÷(2-number of missing responses)
Spouse's desire for self-reliant life style	QB11d,f	B11d + B11f÷(2-number of missing responses)
Head's desire for change in employment	QA6,QA6a	A6 + A6a÷(2-number of missing responses)
Spouse's desire for change in employment	QB6,QB6a	B6 + B6a÷(2-number of missing responses)

CODING OF VARIABLES

All variables should be created using a specific coding format. These are listed in Table 6-2 which also provides the formula name for the variable and its source on the field instrument.

TABLE 6-2

CODING FORMAT FOR PERSONAL CHARACTERISTICS VARIABLES

Variable Description	Variable Name	Instrument Question Number	Variable Code
Sex of head	SEXH	Q9	0=female 1=male
Marital status	MARIG	Q9	0=single 1=married
Children in household under age 18	KIDS	Q9	0=no children 1=children
Age of head-less than 25	A25H	Q9	0=not under 25 years 1=under 25 years
Age of head-25-34 years	A34H	Q9	0=not in age group 1=25-34 years
Age of head-35-44 years	A44H	Q9	0=not in age group 1=35-44 years
Age of head-45-64 years	A64H	Q9	0=not in age group 1=45-64 years
Age of head-65 years or older	A65H	Q9	0=not in age group 1-65 or older
Age of spouse-less than 25	A25S	Q9	0=not under 25 years 1=under 25 years
Age of spouse-25-34 years	A34S	Q9	0=not in age group 1=25-34 years
Age of spouse-35-44 years	A44S	Q9	0=not in age group 1=35-44 years
Age of spouse-45-64 years	A64S	Q9	0=not in age group 1-45-64 years
Age of spouse-65 years or older	A65S	Q9	0=not in age group 1=65 or older
Race of head	RACEH	QA12	0=non-Native 1=Native
Race of spouse	RACES	QB9	0=non-Native 1=Native
Education of head-less than high school	LHSCHH	QA1	0=not in group 1=did not complete
Education of head-completed high school	HSCHH	QA1	0=not in group 1=just completed high school

TABLE 6-2 (CONT.)

Variable Description	Variable Name	Instrument Question Number	Variable Code
Education of head-attended some college	SCOLLH	QA1	0=not in group 1=attended some college
Education of head-completed college or more	COLLH	QA1	0=not in group 1=completed college or more
Education of spouse-less than high school	LHSCHS	QB1	0=not in group 1=did not complete high school
Education of spouse-completed high school	HSCHS	QB1	0=not in group 1=just completed high school
Education of spouse-attended some college	SCOLLS	QB1	0=not in group 1=attended some college
Education of spouse-completed college or more	COLLS	QB1	0=not in group 1=completed college or more
Employment status of head	EMPH	QA2	0=employed 1=unemployed
Occupation of head-professional-technical	PTH	QA3	0=not in occupation 1=professional-technical
Occupation of head-managerial-administrative	MAH	QA3	0=not in occupation 1=managerial-administrative
Occupation of head-sales or clerical	SALESCH	QA3	0=not in occupation 1=sales or clerical
Occupation of head-skilled blue collar	SBCH	QA3	0=not in occupation 1=skilled blue collar
Occupation of head-laborer	LABH	QA3	0=not in occupation 1=laborer
Occupation of head-service worker	SERVH	QA3	0=not in occupation 1=service worker
Employer of head-private industry	PVTH	QA4	0=not employed in private industry 1=employed in private industry
Employer of head-government	GOVH	QA4	0=not employed in govt. 1=employed in govt.
Head's fixed income retirement status	FIXINCH	QA9	0=not fixed income retired 1=retired on fixed income

TABLE 6-2 (CONT.)

'ariable Description	Variable Name	Instrument Question Number	Variable Code
Head's desire for new job	NJOBMOTH	QA6 ,QA6a index	1=definitely not 2=consider job change 3=want to change jobs
{cad's length of time /ith current employer	TEMPLH	QA5	0=less than 5 years 1=5 years or more
Employment status of ;pouse	EMPS	QB2	0=not working now 1=employed
)ccupation of spouse-professional-technical	PTS	QB3	0=not in occupation 1=professional-technical
occupation of spouse-nanagerial-admini strative	MAS	QB3	0=not in occupation l=managerial-admini strative
occupation of spouse-;ales or clerical	SALESCS	QB3	0=not in occupation 1=sales or clerical
)ccupation of spouse-;killed blue collar	SBCS	QB3	0=not in occupation 1=skilled blue collar
)ccupation of spouse-laborer	LABS	QB3	0=not in occupation 1=laborer
Occupation of spouse-service worker	SERVS	QB3	0=not in occupation 1=service worker
Employer of spouse-private industry	PVTS	QB4	0=not employed in private industry 1=employed in private industry
Employer of spouse-government	GOVS	QB4	0=not employed in govt. 1=employed in govt.
Spouse desire for new job	NJOBMOTS	QB6,QB6a index	1=definitely not 2=consider job change 3=want to change jobs
Spouse's length of time with current employer	TEMPLS	QB5	0=less than 5 years 1=5 years or more
Initial attitudes of head toward growth	GI H	QA13a,b, c,d,e index	1=strongly opposed 2=somewhat opposed 3=mixed 4=somewhat in favor 5=strongly in favor
Initial attitudes of spouse toward growth	GIS	QB10a,b, c,d,e	1=stongly opposed 2=somewhat opposed 3=mixed 4=somewhat in favor 5=strongly favor

TABLE 6-2 (CONT.)

Variable Description	Variable Name	Instrument Question Number	Variable Code
Small town motivation of head	SMLMOTH	QA14a,b index	1=not at all important 2=not very important 3=somewhat important 4=very important 5=extremely important
Small town motivation of spouse	SMLMOTS	QB11a,b index	1=not at all important 2=not very important 3=somewhat important 4=very important 5=extremely important
Personal economic benefit motivation of head	INCMOTH	QA14c,e index	1=not at all important 2=not very important 3=somewhat important 4=very important 5=extremely important
Personal economic benefit motivation of spouse	INCMOTS	QB11c,e index	1=not at all important 2=not very important 3=somewhat important 4=very important 5=extremely important
Self-reliant motivation of head	AKMOTH	QA14d,f index	1=not at all important 2=not very important 3=somewhat important 4=very important 5=extremely important
Self-reliant motivation of spouse	AKMOTS	QB11d,f index	1=not at all important 2=not very important 3=somewhat important 4=very important 5=extremely important
Long term job benefits motivation of head	JOBMOTH	QA14g	1=not at all important 2=not very important 3=somewhat important 4=very important 5=extremely important
Long term job benefits motivation of spouse	JOBMOTS	QB11g	1=not at all important 2=not very important 3=somewhat important 4=very important 5=extremely important

MANIPULATION OF NON-DUMMY VARIABLES

The majority of variables used in the prediction equations are dummy variables or their equivalents in which the variables are coded for the absence or presence of that item. For variables that do not fit this pattern, the mean score of that variable must be subtracted from the coded value. This can be performed through use of a single compute statement once the mean value of the variable has been determined for each community. Variables for which the mean must be subtracted from the coded values are listed in Table 6-3.

TABLE 6-3

NON-DUMMY VARIABLES FOR WHICH MEAN MUST BE SUBTRACTED

Variable Description	Variable Name
Head's desire for new job	NJOBMOTH
Spouse's desire for new job	NJOBMOTR
Initial attitudes of head toward growth	GIH
Initial attitudes of spouse toward growth	GIR
Small town motivation of head	SMLMOTH
Small town motivation of spouse	SMLMOTR
Personal economic benefit motivation of head	INCMOTH
Personal economic benefit motivation of spouse	INCMOTR
Self-reliant motivation of head	AKMOTH
Self-reliant motivation of spouse	AKMOTR
Long term job benefits motivation of head	JOBMOTH
Long term job benefits motivation of spouse	JOBMOTR

Prediction Equations

Ideally, the relationships between personal characteristics and changes found to be consistent in Fairbanks and Valdez can be used to predict changes in other communities. Several complications and qualifications, however, make such a practical application of our results difficult. First, we have no proof that the observed relationships will hold in other communities; this is particularly likely in communities composed primarily of Alaska Natives. Second, predictions of change must be "based on equations which apply numerical weights to observed personal characteristics. The Valdez and Fairbanks results provide us with two sets of numerical weights (regression coefficients) which invariably are not identical. Therefore, the construction of general predictive equations is not simply a matter of plugging in observed values; rather, it is necessary to make informed judgments and engage in a healthy share of trial and error testing in order to arrive at a useful set of equations. Third, several personal characteristics that were not entered in either the Fairbanks or the Valdez analysis nevertheless are expected to significantly influence change. While we do not have empirical estimates of their predictive importance (regression weights), we have inserted these variables in our predictive equations where appropriate.

Finally, thirteen of the fifteen predictive equations include at least one independent variable which is a predicted value itself. For example, the prediction of increased time spent working is partially influenced by whether a person is predicted to have a better job directly or indirectly due to the energy project. These "chains" of predictions raise an important point: individual changes do not occur in isolation, they tend to be associated with other changes. However, errors in early predictions are compounded with later errors as we proceed down the list of predictive equations. Even the first equation predicting work directly on the energy project is far from perfect; only 43 percent of those in Faribanks who actually worked on the project were predicted to do so by the equation. This is a significant improvement over what we could do by chance but clearly substantial room for error remains. When we add this error to errors resulting from other predictive equations, it is not difficult to see that extreme caution should be used in their application to other communities. We suggest that the equations be used in preliminary analyses as a means of identifying possible differences between communities and population groups that might experience one or another types of important changes. In the light of the above, then, Table 6-4 lists the predictive equations. The meaning of the variable names is given in Table 6-2.

TABLE 6-4

PREDICTIVE EQUATIONS

1. a) ENERGJH= .25 + .04*SEXH + .08*MARIG + .18*A25H - .01*A65H + .09*MAH + .32*LABH . .22*COLLH + .03*INCMOTH - .04*SMLMOTH + .04*G1H - .07*KIDS + .05*NJOBM(JTH . .15*TEMPLH - .03*JOBMOTH + .10*EMPH
   b) RECODE ENERGJH (-2.0 THRU 0.45=0)(.45 THRU 1.5=1)

2. a) INDJOB = .16+ .20*SEXH + .02*MARIG + .14*A25H + .07*A44M - .15*A64H + .07*PTH - .02*MAH - .07*LABH - .16*SERVH + .-j3*IN(-'40TH - .05*SMLMOTH + .05*AKMOTH + .04*G1H + .50*ENERGJH - .10*KIDS
   b) RECODE INDJOB (-2.0 THRU 0.45=0) (.45 THRU 1.5=1)

3. a) WKINCR = .23 + .08(MARIG + .19*A34H - .21*A64H + .22*MAH + .41*INDJOB
   b) RECODE WKINCR (-2.0 THRU 0.45=0)(.45 THRU 1.5=1)

4. INCINCR = RND(.40 - .32*A64H - .05*AKMOTH + .27*ENERGJH + .18*INDJOB)

5. a) INCDCR = RND(.40 - .15*ENERGJH + .20*SEXH - .26*MARIG - .04*INCMOTH)
   b) IF (INCINCR EQ OAND INCDCR EQ O) INCMOD = 1

6. FAMDCR = .25 + .46*WKINCR

7. ORDCR = .28 + .37*WKINCR

8. HUNTDCR= .38 + .16*WKINCR

9. SOCDCR = .29+ .32*WKINCR

10. HOUSEP = .10 + .13*INCMOD + .24*MARIG + .48*A34H - .04*AKMOTH - .13*KIDS

11. OTHERP = .15 + .18*INCMOD + .43*MARIG + .67*A34H - .04*AKMOTH

12. PERSAT = RND(2.0 + .35*ENERGJH+ .14*INCINCR+ .53*INDJOB)

13. G2 = RND(2.8 + .34*G1H - .30*A25H + .16*A64H - .13*SCOLLH + .12*INCMOTH - .08*AKMOTH + .24*PERSAT

14. MOVE = .34 - .12*A65H + .04*INCMOTH - .06*SMLMOTH

RECODE FAMDCR, ORDCR, HUNTDCR, SOCDCR, "HOUSEP, OTHERP, MOVE (-2.0 THRU 0.45=0)(0.45 THRU 1.5=1)

Application of Model to Kenai Borough Communities

In order to provide a test demonstration of the predictive model, it was applied to three potential OCS impact communities on the Kenai Peninsula: Seward, Seldovia and Homer. Surveys which had been conducted in these communities in 1976 provide a data base for this demonstration. In Seldovia, a 23 percent random sample had been conducted to yield 52 interviews; in the Seward area, 100 interviews were conducted which constituted an 11 percent sample of all households. In the Homer area, 235 interviews were conducted in households both within and outside of the city limits. Since different sampling fractions were used in the urban (40 percent) and rural (20 percent) Homer areas, these samples were weighted in the analysis. Additional surveys in English Bay and Port Graham were not used in the demonstration because of the very small sample sizes in both communities.

Since the Kenai interviews were conducted long before the Predictive Indicator Study results became available, the data available does not perfectly match the data required for the predictive equations.[1] In addition, the same organization did not design, administer and code the interviews from Homer that conducted the surveys in Seldovia and Seward. As a result, all variables are not strictly comparable and in some cases

[1]All motivation questions, for example, had only been asked of the respondent, and it had to be assumed that these were similar and could be applied to the household head.

estimates of variables had to be constructed.[2]

Many Kenai residents are Native and/or employed as fishermen. The Valdez and Fairbanks case studies were not able to identify the relationships between these two key personal characteristics and individual change because the number of persons possessing these characteristics was too small.

We are hesitant to even postulate relationships for these characteristics. Although we might expect Natives generally to have a lower likelihood of transferring to energy development employment, local hire and Native corportation contracts might make it more likely that Natives be employed in specific localities or on specific jobs. The likelihood of fishermen working on a project may also be contingent on the viability of the local industry. Our research in Valdez found that most individuals active in fishing did transfer to pipeline employment, although the small and marginal role of both fishermen and the fishing industry in Valdez may largely account for this. Results from Scotland and the North Sea indicate an opposite relationship. In the Kenai Peninsula coastal "communities, where fishing does constitute a very viable industry, the results are unknown. In our analysis of the Kenai communities, race is merely not considered as a variable. Those with a fishing occupation are analyzed indirectly, since by definition they are excluded from belonging to other

[2] In the Homer survey, ages and education levels of the household head were not obtained, unless the head happened to be the respondent. Age and education of the respondent was, therefore, used as an estimate of the household head. In Seward and Seldovia, motivational variables had to be constructed from open ended questions on why the respondent moved to the community and what they valued most about living in it. In Homer, motivational variables were asked directly, as they had been done in Fairbanks and Valdez.

occupational categories which are either positively or negatively used to predict a dependent variable.

A list of the available baseline variables, and their distributions for the three Kenai communities as well as for Fairbanks and Valdez are presented in Appendix D. These constitute the variables that are available and relevant to the Predictive Indicator Study. Although not included in the demonstration, data pertaining to English Bay and Port Graham also appears in Appendix D.

Methodology and Results of the Kenai Demonstration

All the baseline characteristics from the Seward, Seldovia and Homer surveys were first recoded to conform with the coding instructions provided in our discussion of the field instrument. Predictions were then made by applying the data for each community to the predictive equations presented in this chapter. These estimates of predicted outcomes are seen in Table 6-5.

The estimates made in Table 6-5 include predictions for five of the dependent variables discussed in Chapter III. These include the proportion of household heads who will work directly on the energy project, receive indirect job benefits from the project, experience significant gains and declines in income, and finally show high levels of personal satisfaction during the anticipated impact period. Although we have presented equations for the prediction of other variables, a demonstration of the application of five should be sufficient.

It is important to remember that one prediction is frequently dependent

TABLE 6-5

DEMONSTRATION OF ESTIMATED OUTCOMES PREDICTED FROM BASELINE PERSONAL CHARACTERISTICS IN SEWARD, SELDOVIA AND HOMER
(percent)

	Seward	Seldovia	Homer
Estimate of direct employment of household heads on energy project	23	17	19
Estimate of household head's perception of indirect job benefits	2	14	6
Estimate of families receiving large income gains	24	25	27
Estimates of families receiving no income gains or declines	18	23	7
Estimates of household heads receiving high levels of personal satisfaction	25	31	25
Number of Respondents:	100	52	235

as a previous prediction. Referring to the equations in Table 6-4, the estimate of those working directly on the energy project (ENERGJH) constitutes the one variable based exclusively on the known personal characteristics of residents. Predictions of those perceiving indirect job benefits and changes in income are in turn based on this first prediction. It is particularly important to note that since the Predictive Indicator Study did not identify the community characteristics which influence all types of community change and since the study did not address the relationships between objective community changes and assessments of these changes, changes in community assessments cannot be predicted. For this reason, the observed influence of community assessments on personal satisfaction cannot be taken into account.

The results presented in Table 6-1, therefore, should be regarded strictly as a demonstration of the method of prediction and not as actual predictions of change. In general, the predictions show that roughly comparable proportions of household heads are likely to work on the energy project in the three Kenai communities as were found to be working on the pipeline in Fairbanks and Valdez (14 and 16 percent, respectively). Differences in estimates between the three demonstration communities are not great. They vary from 17 percent in Seldovia to 23 percent in Seward, and they are certainly not large enough to be considered important. The differences, however, do exist. The higher estimate in Seward is probably due to the larger proportion of individuals under age 25, in managerial and administrative occupations, without children and with more positive attitudes toward growth.[3] All of these characteristics were found to be positively related to direct pipeline employment in Fairbanks and Valdez. Estimates for those receiving indirect job benefits from a potential project were more variable. This may be largely due to the disproportionately higher numbers in the 45-64 age group and greater employment in managerial and administrative occupations in Seward than in Homer and Seldovia, as well as lower motivations toward a self-reliant life style. If these estimates have validity, they would suggest a narrower dispersal of indirect benefits in communities which share the personal characteristics apparently evident in Seward.

The three communities showed virtually identical proportions of families which are estimated to experience significant income gains. In light of

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[3]For comparative figures between the three communities, see Appendix D.

the higher proportion in the 45-64 age group in Seward, which is negatively associated with income gains, this is possibly surprising. However, this is offset in Seward by the smaller number indicating self-reliant life style motivations, and a higher proportion estimated to work directly on the energy project. Homer provided a major difference in that only a small proportion were estimated to experience relative income declines, which can be directly attributed to the larger proportion of both married households and those who reported income gain motivations. In turn, Seldovia was estimated to have higher levels of personal satisfaction than the other two communities, for which the higher proportion receiving indirect job benefits is primarily responsible.[4]

The general conclusion from this brief demonstration and comparison is that the predictive equations can be used for providing distinctions between potential OCS site communities. Because of limitations on the baseline data that was used, and the unavailability of certain measures on the one hand and lack of coefficients for other variables on the other, no pretensions are made that these constitute accurate estimates for each community. In fact, an overviewof Table 6-5 shows that the similarity in results between the three communities generally outweigh their differences. In addition, certain predictions, such as those for significant Income gains, result in estimates that are significantly lower than those found to actually occur in Valdez and Fairbanks. Additional research will obviously be necessary to further refine these predictive equations, to modify coefficients and to add variables which are presently lacking,

[4]Community assessments, as noted, have been excluded from the predictive equation for personal satisfaction.

before they can be put to actual and applied use. However, the fact that they did designate certain differences between the **communities** does suggest that it is a profitable area for future research which may be of considerable importance in projecting community impacts.

APPENDIX A

OIL DEVELOPMENT 1968-1978: THE FAIRBANKS PERSPECTIVE

A Brief Outline Based on Newspaper Coverage

INTRODUCTION

The discovery of extensive oil fields on the North Slope of Alaska in the spring of 1968, and the announcement of these finds in July 1968, caused an immediate flurry of excitement in Alaska, and in Fairbanks in particular. The oil finds were welcomed by many individuals because they provided an opportunity for the development and stabilization of the Alaskan economy, which had been precarious in the past. Elmer Rasmussen, Republican candidate for the U. S. Senate, immediately foresaw and pronounced upon the potential that Fairbanks had for becoming not only the hub for North Slope oil exploration and development services but also the location for refinery facilities. Such refinery facilities, if they resulted in cheaper fuel, could further promote the economic development of Fairbanks and the availability of cheaper fuels could also result in Fairbanks becoming more important in the air transportation industry.

HISTORICAL BACKGROUND

That the oil find should be immediately interpreted by some people in terms of assisting the economic development of Fairbanks is hardly surprising in a community that, from its inception, had experienced economic instability. The city of Fairbanks was established in 1902 following the discovery of gold in the vicinity. Early growth was

TABLE A-1

City of Fairbanks Population,
And Population of District

1910-1968
(In Persons)

Year	Fairbanks City Limits	Fairbanks District[1]
1910	3,541	11,000 (approx.)
1920	1,155	2,182
1929	2,101	3,446
1939	3,455	5,692
1950	5,771	19,409
1960	13,311[2]	43,412[3]
1968	n.a.	45,3003

[1]Although the area referred to as the Fairbanks District has not been the same in every Census, the population changes have been roughly in accordance with the spread of the settled area and the increase in population in the places previously settled. The district figures include the city in each case.

For 1929, 1939 and 1950, the district figures shown refer to the Fairbanks Recording District. For 1960 and 1968, the district population figures are those of the Fairbanks Census District, which is co-terminous with the original Fairbanks Election District defined in the State Constitution. Although the original Fairbanks Election District has subsequently been combined with the Upper Yukon Election District, it is the original, smaller area which will again be used In 1970 as the Fairbanks Census District.

[2]The large increase in the city population from 5,771 in 1950 to 13,311 in 1960 is accounted for by a growth of 2,545 in the former area of the city and annexation of some suburban areas with a 1960 population of 4,995.

[3]The 1960 total population of 43,412 consisted of 9,880 military personnel and 33,532 civilians. Estimated 1968 population included 8,920 military personnel and 36,380 civilians.

Source: Bureau of Census Surveys for 1910-1960; the 1968 figure Is an estimate prepared by the Alaska Department of Labor, Employment Security Division, Research and Analysis Section.

Alaska Review of Business and Economic Conditions, January 1970, Vol. I, No. 1, ISEGR.

Intermittent, with population influxes accompanying each gold discovery and out-migrations of population following the exhaustion of easily accessible gold deposits. By 1910 the city had a population of 3,541, with approximately 7,000 living in the surrounding area. Gold production had so declined by 1920 that the population of the whole district had dropped back to 2,182. However, the completion of the Alaska Railroad in 1923 enhanced Fairbanks' position as the service center for the interior and also made large scale gold dredging methods practical. During the 1930's gold production expanded in the Fairbanks area resulting in general growth.

World War II altered the economic structure of the area. In this war Alaska was of vital strategic importance for the U.S.A. Although gold mining was curtailed by the federal government, two military bases were established and a military highway connecting Alaska with the continental United States was completed, with its northern terminus at Fairbanks. The gold mining industry resumed operations following the war and continued until the closing of the last major dredging operation in 1963. Fairbanks experienced a heavy period of growth following the war, beginning with a construction boom to accommodate the federal government's long range bomber program. Eielson Air Force Base was constructed and Ladd Air Force Base expanded. The construction boom continued through the 1950's with work on various federal communications systems (DEW-line, BMEW-line, etc.). During this period, Fairbanks became the air transportation center for the northern half of the state. The period of very high levels of construction activity ended In 1960. The Fairbanks area economy was relatively stagnant from 1963 to 1968. During these years the area economy failed to provide enough jobs for residents, which is reflected in high unemployment levels, running between 7% and 11% between 1961 and 1968. A net out-migration of population took place during the period 1960-1968, which usually indicates a lack of job opportunities.

Against this background it is easy to understand with what joy the discovery of North Slope oil was greeted by some groups in the population of Fairbanks.

INITIAL REACTION TO THE OIL FIND

Amongst the first to publicly welcome the oil find and suggest what a role it could play in the development of Alaska's economy was the Governor of Alaska, Walter Hickel. Recognizing immediately that the vital missing element in capitalizing on the oil find would be transportation of the oil to population centers, Hickel called upon the already established NORTH Commission to address the problem. At the same time Hickel made it clear that the economic development of Fairbanks could be closely tied to the development of North Slope oil activity, but whether it would be would depend on whether the people of Fairbanks grasped the opportunity to become the service center for this activity. If they did not embark on an aggressive campaign to become the service center, the activity and accompanying economic development could easily enough take place in Anchorage instead.

The local business community accepted the challenge with alacrity. The local Chamber of Commerce, the City and Borough Administrations, "the Governor's office and state administration, the Fairbanks business community, candidates for federal political office and the widely circulated daily newspaper (The Fairbanks Daily News-Miner) joined forces to carry out a campaign to insure that Fairbanks became the service center for North Slope oil development. The campaign consisted first of consultations with Canadians from provinces where oil development had taken place, to try to discover what preparations must be undertaken. Next Fairbanks played host to a group of oil executives to try to discover what the needs of the oil industry would be. From these two exchanges the general consensus of opinion generated was that if oil development was centered in Fairbanks it would lead to a rapid increase in population (it was suggested that the population could double in ten years) and this growth would be accompanied by economic activity that could solve Fairbanks' unemployment problem for the short-term and lead to a stable economy in the future. However, such a change of situation would not come automatically. Fairbanks would only become the service center if it aggressively competed to be chosen as such, and this would mean insuring that the oil was sent to market by a method of transportation that passed through or close-by Fairbanks, providing all the necessary services and facilities that would attract the oil industry services to Fairbanks {these included housing, schools, airport facilities, industrial park space, utilities, recreation, etc., etc.), insuring that these services were available at a competitive price, training and providing a work force to be employed in the activities on the North Slope, and welcoming development (and all its side effects). That Fairbanks suffered from shortcomings in some of these areas was immediately recognized: in mid-1968 Fairbanks was suffering from a housing shortage, inadequate utilities (the telephone system was in particularly bad shape), insufficient school accommodations (two previous capital construction bond issues had been rejected) and uncontrolled development.

The response of those groups who favored development was to advocate the creation of a comprehensive development plan for Fairbanks that could serve as a means of identifying the city's problems and shortcomings and could also provide a blueprint for development during the desired period of growth. This planning exercise would complement the work that the NORTH Commission had embarked upon to study transportation alternatives for the North Slope.

In response to the planning suggestions, the Fairbanks Chamber of Commerce, which had been requested by Governor Hickel to participate in development efforts, formed an Oil Impact Committee to work on planning and co-ordinating the development of Fairbanks. Meanwhile, the North Star Borough employed a new planner and the Rotary Club established the Fairbanks Industrial Development Corporation.

While the NORTH Commission was involved in studying transportation alternatives to the North Slope, ARCO (Atlantic Richfield Company, the oil company that had made the first extensive oil finds) announced that they were carrying out a pipeline feasibility study. In late August 1968, the president of ARCO announced that his company expected that a pipeline would be built to transport oil from the North Slope. He continued, that although no route for a pipeline had been chosen, he expected that the southern terminus of such a pipeline would be Valdez, and that he expected oil to be flowing through the pipeline from Prudhoe Bay by 1971.

During the fall months of 1968 (September, October) speculation about the likely impact of oil development continued while planning efforts were undertaken in earnest. The leader of the Alaska Federation of Natives publicly supported oil development because it would provide jobs for native Alaskans. Aviation activity in support of oil development increased with new cargo routes instituted from Fairbanks to the North Slope to carry freight for oil drilling.

During November it was reported that the North Slope was alive with drilling activity. The Alaska Department of Labor estimated that in November 1968 some 700 men were involved in drilling activities on the North Slope and predicted an increase to 1,200 engaged in oil exploration by the spring of 1969. Accusations were made in the last two months of 1968 that a substantial proportion of workers on the North Slope were Canadian, not Alaskan. The Alaska Department of Labor studied the situation and reported that 12% of oil-related North Slope workers were Canadian. The Department spokesman argued that the oil companies would hire Alaskan natives for work on the North Slope so long as they had the necessary training.

By the end of 1968 the NORTH Commission had reported that the best solution for the North Slope transportation problem would be the construction of a northward extension of the Alaska Railroad, but there was an immediate need for a winter ice-road to haul supplies and equipment to the North Slope to support drilling activity. Governor Hickel promptly approved the proposal for the ice-road and appropriated the remaining NORTH Commission monies to pay for the construction of the road. After going out to bid, it was decided to go ahead with the construction using Department of Highways road crews to expedite the construction.

Fairbanks ended the year of 1968 already experiencing some problems caused by an increasing population but with optimistic expectations about the likely benefits of oil-related development and growth. City and Borough officials were avidly courting oil company executives to insure that Fairbanks would be chosen as the supply center and also to try to persuade them to commit themselves to the establishment of a refinery in the Fairbanks area and, if possible, some petroleum based product industry as well. Fairbanks ended 1968 in a state of anticipatory excitement with optimistic visions of future economic growth. During 1968 only one lone voice was heard and given media coverage arguing that growth and development of Fairbanks would be accompanied by some impact generated problems such as increased environmental pollution (speech to Fairbanks Chamber of Commerce, reported in Fairbanks Daily New-Miner, October 5, page 1).

DEVELOPMENT DURING 1969

During the first half of 1969 drilling and oil exploration activity increased on the North Slope of Alaska, and this was accompanied by increasing oil support activity in Fairbanks. By May it was claimed by borough government that there were 70 new oil service companies in Fairbanks and a population increased of some 1,000 people since the announcement of the oil find six months earlier. City and Borough governments and the Fairbanks business community continued to court the oil industry to try to insure that Fairbanks would become the service center for oil development. This coalition of pro-development interests continued to press for rational comprehensive planning for the Fairbanks area. This group was greatly encouraged when Walter J. Hickel, Governor of Alaska, was appointed Secretary of the Interior in the Nixon government. During the congressional confirmation hearings on his appointment, there was some concern expressed of Hickel's lack of concern with the protection of the environment. Nevertheless, he was confirmed to the position. Keith Miller became Governor of Alaska in Hickel's place: he too was seen to be firmly committed to rapid development of Alaskan oil.

Those groups supporting Alaskan oil development showed concern that the transportation of the oil from the oil fields to the market should utilize a mode that would provide the maximum development benefit for Alaska: a pipeline was considered preferable to the use of ice-breaking oil container ships, and an all-Alaska pipeline was preferable to a pipeline crossing Alaska and Canada. Anxieties over this matter were quelled with the announcement in February that the oil companies had selected an all-Alaska pipeline as the means of transporting the oil from the North Slope. The announcement mentioned a 48", eight hundred mile, $900 million pipeline, to be completed by 1972. Exact details of the route and southern terminum were not worked out until later; however, it was eventually announced on May 29 that Valdez would be the southern 'terminus port for the pipeline. These pipeline announcements were greeted by government, the business community and the media in Fairbanks with great jubilation because of the employment that construction of such a pipeline would provide.

During the first half of 1969 the question of the environmental impact of North Slope oil development was raised by a number of individuals. Concern was first expressed by two representatives in the Alaska legislature: Representatives Sackett and Huslia, both of whom represented predominately native communities, pointed out that North Slope oil development might have an adverse effect upon the wildlife, particularly caribou and fish. The State Department of Fish and Game put forward ideas for the protection of North Slope natural resources. An under-secretary at the Federal Department of the Interior announced that his department was considering an ecological review of the pipeline proposal. Such expressions of ecological concern about North Slope oil development were treated with some scorn in the Fairbanks media as were any suggestions that the engineering problems posed by the pipeline proposal were going to be difficult to resolve. In the Fairbanks Daily News-Miner the problems of the pipeline and oil development were minimized, the benefits maximized. However, the initial problems resulting from an increasing Fairbanks population (such as housing shortages, inadequate utilities and school deficiencies) were highlighted by the media to give support to the argument that Fairbanks must provide adequate services if it was to attract development. There was increasing frustration amongst the pro-development "groups when the voters turned down a bond issue for school capital improvements, and the tight money market resulted in little private capital being available for residential development. For solutions to both these obstacles the local government and business community turned to state government to try to persuade the state government to take the responsibility for providing school capital improvements out of state oil monies, and to pursuade the legislature to raise the 6% interest ceiling to make more private capital available for investment in development.

The exhilaration over the pipeline proposal gradually diminished during the last six months of 1969. All those who supported development wanted pipeline construction to commence as soon as possible. They initially tended to pooh-pooh environmental concerns and could not understand why the oil companies had not obtained a right of way for the pipeline and a permit for its construction by June 1969. Only gradually did the federal government realize the complexities of the projected pipeline design. Meanwhile, Secretary of the Interior Hickel, committed to the development as he was, was already assuring those who pressured him in June that a right of way would be granted and a construction permit given for the pipeline. In Fairbanks, resentment over the hold-up gradually gave way to the realization that some of the environmental and design questions might be legitimate. Another cause for concern at this time was the lack of a final agreement on the Alaska Native Claims Settlement, for it was recognized that this might further hold up the granting of a right of way for the pipeline. When the federal government decided that a $3 million ecological study must be undertaken to devise guide-lines for pipeline construction, state and local government reaction was first one of displeasure and then of resignation. The hold-up resulted in intense anxiety that Fairbanks' great opportunity for development, which had only been glimpsed, might be lost because an alternative way of transporting oil from the North Slope might be found in the interim.

Despite the hold-up on the pipeline, Fairbanks continued to grow and continued to experience problems because community services were inadequate to support the burgeoning population. when the hugh oil lease sales that took place in September realized some $900 million, hope was expressed that some of this money would be made available through revenue sharing for Fairbanks to use to improve its services. Announcements by two oil companies that they would build oil refineries in the Fairbanks area were hailed by those who favored development as positive effects of oil development that would result in employment and a more stable economic base for the Fairbanks area.

At the end of 1969 the situation of uncertainty still prevailed with no pipeline right of way or construction permit granted, and many environmental and design questions still unanswered.

1970

In the first half of 1970 there was apparently a gradual awakening of environmental consciousness amongst Alaskans. Resulting from a number of seminars and workshops addressing pipeline development, a number of groups and individuals took up the conservationist cause in Fairbanks and began to be heard as a voice opposing the scramble for development that the local and state governments and the business communities had advocated. The Alaska Conservation Society in Fairbanks took a stand against local taxes being used for planning activities which were in fact thinly veiled promotional activities for economic development. In the national political arena the American Wilderness Society endeavored to obtain a court injunction to prevent pipeline construction while several Alaska Native communities withdrew their consent for pipeline right of way over their land.

In an attempt to try to exert pressure upon the federal government to permit North Slope development to proceed, Governor Miller introduced the idea that the state should go ahead and build the proposed haul road that would parallel the pipeline route. After much discussion the state legislature approved this plan and gave the go-ahead for it. However, the idea was eventually abandoned when it proved impossible to gain agreement with the oil companies on reimbursement. The proposal that the state should construct the haul road had been enthusiastically endorsed by pro-development groups in Fairbanks, who felt the road would make possible the development of many North

Slope mineral resources other than oil and would therefore be a good investment even if the pipeline project did not proceed.

The state constructed haul road project was embraced in Fairbanks as a ray of hope in a very bleak prospect. There was no sign that the construction permit or right of way for the pipeline were soon to be granted. The chorus of conservationist criticisms were ever increasing and in Fairbanks fears of a wind-down of North Slope oil exploration activity and wide-spread unemployment haunted those who had most ardently sought for the development of Fairbanks. Even a personal visit by Secretary of the Interior Hickel, who assured leaders in Fairbanks that the pipeline would be built and would not damage the environment, failed to convince. In May it was reported that the pipeline holdup was the result of orders from the White House, the Nixon administration having become increasingly conservationist.

On the last day of June 1970 the electorate of Fairbanks was faced with a $17 million bond proposal for school construction. The bond issue was soundly defeated. The defeat was attributed to pipeline uncertainty - and to apathy since only 25% of the electorate voted.

Another cause of concern in Fairbanks during the delay was the fact that with rampant inflation, the cost of constructing the trans-Alaska pipeline was soaring higher every day. Some feared that these soaring costs might make the pipeline project become too expensive, or that during the period of delay a cheaper alternative method of transportation might be found. However, some groups welcomed the delay, arguing that it provided the time to carry out the design and environmental studies that would result in the pipeline being constructed with proper safeguards eventually. For the remainder of 1970 many different studies - design, impact, North Slope transportation, etc. - continued.

In August the group of oil companies that formed the Trans Alaska Pipeline System reorganized themselves and formed the Alyeska Pipeline Service Company, a company specifically formed for the management of the pipeline project. Alyeska submitted new plans for the pipeline project. These changes were warmly welcomed by Secretary of the Interior, Hicke, and there was some optimism in Alaska that the pipeline permit would be granted, leaving only the Alaska Native Claims Settlement resolution blocking pipeline construction. This optimism subsided when President Nixon fired Hickel at the end of November. Though reasons for firing Hickel were not openly given, it was generally concluded that Hickel had been too pro-oil while Nixon had been becoming more conservationist. Hickel 's firing meant that the pipeline question had still not been resolved at the end of the year. Nor had the Alaska Native Claims been settled.

1971

The year 1971 was a lean year for Alaska in general and for Fairbanks in particular. The pipeline project showed no apparent progress during the year. There was no resolution of the design questions for the pipeline, nor until the very end of the year was agreement reached on the Alaska Native Claims Settlement. Despite several efforts by the State government, Alaska's congressional representatives and the Chamber of Commerce, the pipeline project appeared to be tied up in knots. Pipeline hearings were held during February by the federal Department of the Interior in Washington, D. C. and Anchorage. The Washington, D.C. hearings were dominated by the conservationist groups, determined that the pipeline should not be built, while the Anchorage hearings were dominated by Alaskans who argued that the pipeline could be built without damaging the environment, and should be built because Alaska needed it. But even though the Department of the Interior affirmed that despite the setbacks the pipeline would eventually be built, the people of Alaska and of Fairbanks became dispirited at the long delay and the uncertainty. During February the unemployment figures for Fairbanks hit new lows - 12% of the working force was registered unemployed and it was claimed that 90% of union workers were out of work. The state commissioner of labor testified at the pipeline hearings that the state unemployment rate was 25% and would be 33% by 1972 if the pipeline construction did not start. Many businessmen in Fairbanks area were also at a low ebb, they had invested millions of dollars during 1969 and 1970 in anticipation of pipeline activity. Many had over extended themselves and the pipeline delay meant ruin for some. By March 1971 Alaskans had braced themselves for an indefinite delay. There were extensive cuts in the state budget which brought new blows to the Fairbanks economy with cuts in proposed University developments and the detoxification center planned for Fairbanks slashed from the state budget. Federal spending was also curtailed. The defense cuts included dropping three Nike sites near Fairbanks which provided employment for some 400 personnel. The prospects for Fairbanks were grim. In an editorial on March 12 the Pioneer All-Alaska Weekly announced "Fairbanks is now at the bottom of the barrel."

Despite the bleak economic future, some projects did go ahead, such as extensions to the municpal sewer and water systems, the expansion of Fairbanks International Airport and the completion of the new Fairbanks hospital. By mid-summer the people of Fairbanks had pulled themselves out of the depths of their depression and were again eagerly following the twists and turns of the pipeline saga. For the latter part of the year interest was focused on the Native Claims Settlement Act which was being worked on by congressional committees. Agreement on the Native Claims Settlement was finally reached by the end of the year, offering to Alaskans the pleasant prospect that the pipeline might go ahead in 1972.

<u>1972</u>

Once the Native Claims Settlement accord was reached, the remaining obstacles preventing the commencement of pipeline construction were the absence of a permit for construction and the court injunctions against the pipeline. Removal of these obstacles depended upon the satisfaction of design and environmental criteria which would insure a safe pipeline that would not unduly damage the Alaskan ecology. In April 1972 the Department of the Interior produced the pipeline environmental impact statement - a massive document, weighing 18 pounds! Questions about the pipeline design proposed by Alyeska continued to be raised and remained unanswered. In August the court injunction against pipeline construction was lifted. In December the Economic and Sociological Impact Study commissioned by Alyeska from Mathematical Sciences Northwest was published.

1973

When in February 1973, the U.S. Court of Appeal decided that Alyeska could not go ahead with the pipeline without Congressional approval, the future of the pipeline project seemed again remote. Many people in Alaska were so frustrated by this time that a serious drive began to collect signatures for Alaskan Independence! The Alaskan Congressional delegation mounted a concerted campaign to expedite the pipeline decision in Congress. This effort paid off. In May the Interior Committee again set to work on pipeline legislation. On July 20, 1973 the Senate gave the green light for pipeline construction and by mid-August the House of Representatives had also consented to pipeline construction; however, as the two bills differed a conference committee was necessary. In mid-November the Pipeline Bill finally passed both houses and at the very end of the year President Nixon signed it into law. There is no doubt that the national energy crisis which gripped the nation during the year played an important part in the passage of the legislation. Pipeline supporters drew attention to the nation's unnecessary dependence on foreign oil sources when vast Alaskan oil resources lay unused for lack of a means of transport from the North Slope.

With passage of the legislation through both houses spirits rose in Fairbanks and preparations for pipeline construction and for accomodating the pipeline population influx took up again where they had stopped in 1969. Though the delay was generally regretted, most people felt that the pipeline would be a better and safer project because of the additional studies, and although neither the school nor housing problems had been solved, Fairbanks was considerably better prepared for pipeline impact in 1974 than it would have been had the pipeline gone ahead in 1969 as the pipeline promoters in Fairbanks had first thought it would.

1974

The year 1974 was one of economic optimism and rapid growth for Fairbanks. At the beginning of the year, long lines of workers had already formed outside local unions in hopes of the abundant pipeline jobs promised. Environmental groups had dropped their fervent opposition, and once the Alaskan and federal governments had agreed upon dominion of control over pipeline corridor land, the way was paved for the signing of the long-sought federal permit on January 23. Bureaucratic paperwork and last minute details yet remained. Public reactions in Fairbanks were generally favorable, although most spurned the occasion as rather anticlimactic to the events of 1969. Most felt well prepared to meet the impact of the project.

Parallel to preparation for commencement of pipeline construction, several other issues were activated. A long series of debates and negotiations concerning the proposed gas pipeline began. Several alternatives were envisioned, including a trans-Canadian pipeline. This drew mixed reactions on both Canadian and American sides. Also plans were initiated for the $45 million crude oil refinery and power generating complex to be built by Earth Resources Company in North Pole.

Once pipeline construction was assured, focus quickly shifted to its possible impacts. Here, too, initial optimism prevailed. Fairbanks Borough Mayor Carlson announced that the pipeline impact would cost the borough $5.5 million in the next eighteen months, and expressed his plan to ask for state impact aid. Most governmental officials strongly believed that local communities would receive all the help they would need to offset the impact. The dearth of social and economic impact research left little ground on which to plan. Hence, new federal regulations required social and economic as well as environmental impact studies to be done for all similar future projects.

In February, a $3.6 million grant was awarded to train Alaskans for oil jobs, although a lack of vocational training in Alaska created problems. In addition, Alyeska Pipeline Service Company and Fluor awarded more than $7.6 mill ion in purchase and service contracts to Fairbanks-based firms. Alyeska, Bechtel and other pipeline-associated companies were also hiring staff in Fairbanks. Fairbanks became the center for pipeline labor, communications, transportation, staging, service and supply for the project. Hence, pipeline business and profits accrued to the local population, and many Alaskans were assured of having jobs. Rumors began to spread, however, of the comparably high salaries being paid for pipeline jobs, and soon thousands of workers were expected to descend on Fairbanks. The city suddenly began to feel ill-prepared for such a predicament.

For the first time, only one month before construction was to commence, thoughts turned to the post-construction period. Initial future predictions had not supported a boom and bust theory, but rather anticipated that Alaska's economy would continue on an accelerated growth rate throughout the 1980s. This initial stance was later replaced by predictions of severe unemployment in the post-construction period.

In April, after numerous debates in the State Legislature and public forums, a summary of predicted pipeline impact problems was listed in the Fairbanks Daily News-Miner. The estimated impact cost had grown to over $4 billion and oil was expected to dominate Alaska's economy for years to come. Peak pipeline employment was estimated at 30,000 workers. Fairbanks and Valdez were pinpointed to receive the greatest relative impact: Fairbanks was expected to receive 13,000 to 15,000 workers, Valdez, 2,500 to 3,500, and Anchorage, 6,000 to 8,000. Overall population size was expected to increase by over 100 percent in Valdez and 25 to 50 percent in Fairbanks. Strains were anticipated in housing, health, police, utilities and education. Increased tourism was also expected despite the energy shortage. Negative impact expectations included increases in organized crime, rent, and a serious shortage in housing. The majority of pipeline impacts were seen from a negative viewpoint. In fact, before pipeline construction ever began, Alaska was perceived as a paradise for crime, the housing shortage already existed, and heavy truck traffic between Valdez and Anchorage had created highway maintenance problems. Also as predicted, the University of Alaska faced decreased projected enrollments for the coming year after a previous decline of 14 percent in student enrollment. The University was threatened with a 20 percent budget cut. Thus impact problems had become a reality before pipeline construction was even initiated.

Local opinion in all anticipated impact areas of the state supported the idea that the state should help defray the costs of impact. It was not until May, however, that the Fairbanks North Star Borough finally received $3,030,000 initial impact appropriations.

Controversy over the spending of state oil revenues soon emerged. It was emphasized that the intensity of the pipeline impact would depend on the way these revenue monies were spent: it was expected that the revenues would offset the employment declines resulting from pipeline completion.

In mid-April, Alyeska obtained permission to lease part of Fort Wainwright as a construction management base. This came as a shock to the people of Fairbanks and raised a lengthy debate since many had anticipated that Fairbanks businesses would receive all of the pipeline business and profits rather than government entities. The dispute was finally settled with assurance given to businesses of a share in pipeline prosperity.

On May 1, 1974, Alyeska was finally authorized to commence construction, even though official construction had actually begun on April 29. Twelve hundred workers were already located in construction camps to begin Phase I of the project. This included the construction of a 360-mile haul road from the Yukon River to Prudhoe Bay, preparation of the site terminal in Valdez, and initial work on pump stations along the pipe route. It was announced that state law required Alaskans be given priority in hiring for these jobs. In addition, federal stipulations required that up to thirty five hundred jobs be provided to Alaskan Indians, Eskimos and Aleuts during the construction phases. It was anticipated that a total of ninety-one hundred employees would be needed in the 1974 season. Peak construction for the second season (1975) anticipated 14,200 workers, and for the third season (1976), 10,600.

Main construction contracts were let in June. The entire project was to be completed by mid-1977, with major work on the pipeline to begin in 1975. In Phase II, four additional pump stations would be built, raising the capacity to 1.2 million barrels of oil per day by 1978. The third and final phase would add three more pump stations for a total of twelve.

Temporary labor force shortages occurred for local businesses and industries due to the transfer of labor to pipeline jobs. This problem had been foreseen and was emphasized as only temporary. In a report by the Human Resources Planning Institute, an increase in local work force was predicted from 17,300 to 28,300 by 1980: nearly doubling the population. The total state labor force was expected to increase by 73,000 and the state population was expected to grow from 313,000 to 481,000 by 1980. The report stated that jobs would keep pace with increases in labor force until 1977. In 1978 an estimated 34,000 persons in the state would be unemployed. A continued growth pattern would persevere until 1980, at which time the state would enter a period of severe unemployment (16-17 percent) reinforcing earlier expectations and fears.

Concern also surfaced over the original 1977 completion date of the pipeline project. National material shortages, delivery delays, manpower shortages and lower productivity were given as reasons for this. Cost estimates for the pipeline project, community impacts, the North Pole refinery, and the gas pipeline were steadily rising. In July, Alyeska told of their plans to increase the oil flow from 600,000 barrels per day to 1.2 million barrels per day by mid-1977. By the end of 1974, the estimated cost of the Trans-Alaska Pipeline project had risen to over $5 billion -- an increase of over 500 percent of the original estimate. Also, the $45 million refinery proposed for North Pole had now grown to $71 million, with an increased capacity from 30,000 barrels per day to 50,000 barrels per day.

On August 21, 1974, the Fairbanks Daily News-Miner published an editorial emphasizing the prolonged disastrous effects the pipeline would have on the state economy and questioned the oil companies' hurry to produce and market their oil. Alyeska, Bechtel and Fluor were charged with causing the development of an overall fast moving economy in Fairbanks due to their lure of high wages and the rapid turnover rate that had developed on the pipeline. Individuals with fixed incomes (primarily the elderly and single mothers with children) were unable to cope with the accelerated inflation. Some Alaskans were even forced to leave the state because of the situation. In spite of these local predictions of recession and unemployment at the end of the pipeline construction period, the State Department of Labor continued to paint Alaska's economic outlook as excellent.

To add to the predicament, Governor Hammond announced that there was less money left of the $900 million from the 1969 lease sales than had been expected. This meant that little extra revenue was available to offset social and economic impacts. Thus the state economy became even more dependent on money from future oil production, and the OCS sales were seen as an additional critical factor affecting the state budget and planning.

1975

The year 1975 marked the peak of activities for the Trans-Alaska Pipeline project. While the rest of the nation experienced an economic recession, Alaska experienced prosperity. Pipeline employment was expected to reach 16,000 persons, three-fifths of whom were to be processed through Fairbanks, two-fifths through Anchorage.

Governor Hammond continued to see money trouble and emphasized a worsening condition of the state economy because state revenues were to be loosely contingent on the actual production and flow of oil. Governor Hammond foresaw a deficit of $125 million in fiscal 1977: original lease sale monies would be exhausted before the in-flow of oil revenues would begin. The blame for such a monetary predicament was placed on the delay in pipeline construction. Oil producer's profits, upon which the state's oil revenue share was dependent, were widely debated. Governor Hammond advocated a tight budget, more oil lease sales, and corporate tax reforms as possible solutions.

In April, a change in the functional role of the Bechtel Corporation was effected to eliminate duplication in management of the pipeline project. Alyeska Pipeline Service Company became the manager of construction, and Bechtel the construction services contractor. This meant considerable employee layoffs for Bechtel. Whereas in March Bechtel had 1652 employees, at the beginning of the peak summer construction period layoffs reduced this to a base of 500 to 600 workers.

Speedy construction of the pipeline was emphasized. At the beginning of the second summer season, Alaska was once again besieged by a great influx of people. The State Department of Labor assured Alaskans that they would be given preference for pipeline jobs. Alyeska was convinced, however, that the Alaska Hire Law was unconstitutional, although they were willing to have Alaskans hired first, provided that they were technically qualified.

The Fairbanks Borough received a total of $631,500 in impact aid in 1975 and Fairbanks schools received $1 million in state appropriations: both amounts were less than the original requests. Fairbanks was thus unable to finance all that was considered necessary. The impact on Fairbanks was economically and socially overwhelming. Rapid change was most evident. State boards sponsored numerous workshops and conferences on how to cope with the economic, social and psychological impacts of pipeline growth; however, few concrete solutions were provided for problems. Long range planning and development were still deficient. It was generally felt that the Trans-Alaska Pipeline project was happening to Alaskans, not <u>with</u> them. An editorial in the Fairbanks <u>Daily News-Miner</u> blamed Alyeska for not providing an accurate picture of its needs and expectations so that proper planning could be done. These thoughts soon engendered anti-pipeline feelings and resulted in attempts to preserve theAlaskan life style.

Housing was considered the major impact problem in Fairbanks even though relief was expected as early as the winter of 1975. Other impact problems included increases in traffic congestion, inflationary prices (lack of information on inflation rates made it difficult to establish wages), gambling, prostitution, drug trafficking, demands for police and court services, water consumption, continued construction (which was speculative and overpriced), and a lack of qualified labor. In addition, a record tourist season of 260,000 visitors was anticipated. Unexpected impacts included shortages of hospital facilities and a local high employee turnover rate. The University was besieged by increased demands for technically skilled teachers and technology classes, along with a rising demand for training programs for Natives. On the secondary educational level, a double shift was effected in the high schools, and teenagers began to join the local work force. The impact's number one problem was later redefined as the telephone system which had experienced a 125 percent increase in orders, and a shortage of manpower and equipment. Other problems such as alocholism and child abuse were aggravated. Increases in crime were not as great as anticipated: the Federal Organized Crime Strike Force had investigated the Alaskan situation for more than a year with few indications of significant growth in organized crime. Contrary to expectations, increases in food stamps and public assistance did not materialize, school enrollments declined, and relatively few pipeline employees brought their families with them. In spite of these impact problems, a series of May articles in the Fairbanks Daily News-Miner focused on an optimistic outlook for Alaskats future. The economic activity in Alaska was predicted to be a carbon copy of 1974: it would remain a boom. interestingly, outsider's views of Alaska were grim. In an article published by the Los Angeles Times, Alaska was perceived as being threatened by lawlessness and envisioned a puppet state government in the power of a single Teamster Union chief. Alaska was seen as a place of violence and illegal gambling, and pipeline workers were viewed as non-productive and selfish in interests.

Oil exploration and development activity continued. ARCO and Exxon discovered additional oil and gas reserves offshore southeast of Prudhoe Bay, and the controversial Naval Petroleum Reserve #4 was officially opened, with announcements of plans to drill twenty-four wells over the next seven years. A June report by the U. S. Geological Survey, however, indicated that Alaska held less oil and gas in undiscovered recoverable resources than had been previously announced by the Interior Department. Revised estimates were for 12 to 49 billion barrels of oil (one-fourth offshore) and 29 to 132 trillion cubic feet of natural gas. Hence Alaska's image as a bank of unlimited energy grew relatively weaker.

In August, Commissioner of Labor Ed Orbech reported that the state and Alyeska had finally reached agreement that Alaskans would be the last to be laid off when the pipeline force was reduced. It was proclaimed that the Alaska Hire Act had been successful that year. Total employees for the project had surpassed predictions and numbered 22,000, with layoffs beginning in mid-September. Alyeska predicted a peak of 13,000 workers for 1976. Once the pipeline became operational, however, only 390 jobs would be required to run it, with an additional 300 in Anchorage to handle records and administrative work.

Gas pipeline hearings continued and impact assessment for the project began. The gas pipeline decision delay was viewed as a hindrance to an all-Alaska route, and a trans-Canadian route was perceived as limiting Fairbanks' prosperity. No other plans or programs were considered as an alternative to the recession that was now expected in the post-construction period. A State Labor Department study published in September, however, predicted a significant decline in the economy of Fairbanks even if a trans-Alaska gas pipeline project materialized. The preferential hire of Alaskans for the oil pipeline was seen as crucial because the spending of earnings saved during construction would defray the severity of the post-construction decline. It was estimated that 45 percent of the pipeline workers were nonresidents, with millions of dollars in earnings being sent outside.

Estimates of the costs of the pipeline project rose to $6.37 billion in 1975. Pipeline construction was marked by labor discontent, teamster union strikes, fires, oil spills, and the beginning of a pipe weld inspection scandal. Pipe weld quality control was claimed to be sacrificed for expediency of the project. Additional construction problems encountered were governmental halt-work orders, a lack of housing for workers, a shortage of construction equipment, and the rerouting of more pipeline above ground than had been previously planned. Security of the pipeline against outside terrorists (especially those from the Middle East) was seriously considered for the first time in November.

1976

The gas pipeline debate continued. Negotiations between Canada and the United States were in the final stages for approving a treaty that guaranteed the unimpeded flow of oil and gas between the two. The majority of Alaskans favored an all-Alaska gas route primarily to serve as a buffer for the expected economic decline after oil pipeline completion. A report by the State Department of Labor anticipated that gasline impacts would be enough to offset economic disaster, yet would be considerably less in comparison to the oil impacts.

Alaska's image in Congress changed from that ofa "poor stepchild" to that of a "spoiled rich kid." This meant that Alaska, traditionally a federally-dominated state, might be expected to increase its financial contributions for government projects. This-only served to add more worries to the financial plight of the state. The Alaska State Legislature was faced with an extremely tight money situation, consequently, considerable debate took place over possible major oil tax increases for North Slope oil companies.

In early 1976, loopholes in the Alaska Hire Act were discovered: labor unions involved with the pipeline project had been able to avoid responsibility for preferential hire and had therefore not given Alaskans priority for jobs. In mid-February, just a few months before the last pipeline construction season, the unions tentatively came to an agreement on the issue. Many Alaskans had sought pipeline jobs, and it was claimed that if training and enforcement programs had been initiated earlier, more Alaskans, especially Natives, would have taken advantage of pipeline jobs over a longer time span.

The Ford administration anticipated a west coast oil surplus of 400,000 to 800,000 barrels per day between 1978 and 1970. Consequently, President Ford sought to establish a one-billion barrel oil reserve as insurance against future foreign oil embargoes. The Federal Energy Commission reinforced oil surplus expectations, and talks ensued as to the future market for Alaskan oil. At the close of 1976, the destination of Alaskan oil had still not been decided. Senator Adlai Stevenson stated that Congress had been misled when they approved the Trans-Alaska Pipeline project in 1973 because they were assured that there would <u>not</u> be a west coast oil surplus.

Peak pipeline employment reached 20,000 persons in 1976, 18 percent of whom were minority. For the total project, Alyeska had spent $4.8 million for on-the-job training for 1400 Natives and $1.9 million for class instruction for 1300 Natives. In August, Alyeska began to lay off thousands of workers and permanently shut down construction camps. The project was 98 percent complete, the Valdez terminal, 76 percent. The work force was reduced to 5,000 employees, which would remain a stable figure through June 1977. With the rapid decline in oil pipeline activity, Fairbanks refocused its economic expectations and hopes on the gas pipeline, the North Pole refinery (on which construction had begun in June), and the additional oil explorations that were underway. Thus local businessmen felt that the long-term economy of Fairbanks was relatively stable.

With the end of pipeline construction in sight, controversy continued to rise concerning wellhead prices, the ultimate sale price of oil minus total transportation costs. Reduction of such prices meant a loss to the state in expected oil revenues. No compromise was found. Most Alaskans believed that their economy depended on the use of this oil money, and thus in November took the first initiative towards assuring a sound financial future by creating the Alaska Permanent Fund. Twenty-five percent of oil and gas revenues were to be placed in the fund. Public opinion held that the rest of the revenues should be utilized to provide loans to develop renewable resource industries in the state.

Little progress was made in deciding the future use of the haul road: lack of agreement on this issue persisted throughout 1976. At the end of the year, Governor Hammond's proposal of industrial use for the haul road prevailed.

Pipeline impacts in Fairbanks continued to grow. Housing construction still flourished and disorganized crime was cited by Governor Hammond as the top law problem, while the federal government continued its probe on organized crime in Alaska. Downtown Fairbanks was likened to downtown Anchorage with increased numbers of drunks, prostitutes and rapes, and hence, downtown merchants were gradually losing business. There was an increase in illegal alien immigration into Alaska due to the numerous pipeline jobs, with the immigrant in-flow far exceeding the rate of legal apprehension of illiegal aliens. Increased stresses from pipeline-related jobs had also changed family and community life and structure. A . study by ISER indicated substantial population and income changes in Fairbanks. Along with inflation, there were unprecedently high incomes for nearly everyone (Alaska ranked second in income due to pipeline salaries). The population had increased by a stable 20,000 persons during 1975-1976, but the same number of people were expected to leave the state within the next few years. Fairbanks was described as a young community with an average age of twenty-seven and an average of three individuals per household. Public opinion was evenly distributed concerning the effect and permanency of impact changes. Conclusions were that the advantages and disadvantages of the pipeline were numerous and that the general public had gained personally from the project. The majority favored additional growth, e.g., gas pipeline construction.

1977

In 1977, it was generally believed that the most prosperous years for Fairbanks were over and that the economy would gradually stabilize. As pipeline jobs declined, lines for unemployment compensation grew. Chris Miller, a

Labor Department economist, reported that many people who had left the pipeline had also left the state, and one-fourth to one-third of those who had filed new compensation claims were out of state, causing another major depletion of Alaskan financial resources. Unemployment was expected to reach a record high, and every business sector except the government was expected to feel the economic recession.

Governor Hammond continued emphasizing that oil-rich Alaska was on shaky financial ground. Prudhoe Bay revenues were expected to help ease the decline of economic activity but would not prevent it. To add to the predicament, due to a federal law passed in 1975, the price of oil in Alaska and elsewhere was under federal control. It was feared that federal oil pricing would be so low as to discourage oil production. Out of necessity, the state was expecting to borrow $200 million per year from prospective oil revenues. Relief came in April when the Federal Energy Administration affirmed the right of the state to take its royalty share of Prudhoe Bay oil for in-state use at any time prior to commencement of pipeline operations. This allowed additional time for sale negotiations of the state's royalty oil.

Along with the decrease in economic activity in Fairbanks came the reversal of many impact problems, mainly the severe housing shortage. In Anchorage, however, the growth rate was steadily rising. While Fairbanks had been concerned with its own problems, Anchorage had gradually become the financial, commercial and transportation center as well as the petrochemical capital of the state. Two major impact concerns had been traffic and the rapid pace of growth. Anchorage, because of its larger size and therefore more diversified economy, had fared better than Fairbanks in the end, even though it had experienced a higher unemployment rate.

Pipeline construction continued amid threats from the federal government to shut down operations due to noncompliance with federal requests. Pipeline security was once again raised. Concern was not without reason: fifty gun shots had already been aimed at the pipeline. The State Public Safety Commission suspected foreign agents to be on the pipeline and named Native militants as a security problem. A Federal Senate Internal Security Subcommittee recommended the creation of a new federal agency to protect pipelines against sabotage, to be located under the proposed new Federal Department of Energy.

The future of the haul road was decided when Interior Secretary Cecil Andrus asked Governor Hammond to postpone public use of the haul road until after completion of the planned Alcan natural gas pipeline. Progress of gas pipeline plans, in comparison with those of the oil pipeline, were viewed as more coordinated in effort and process. Fairbanks expected to receive a large proportion of the gas line prosperity. Gas pipeline employment in Alaska was anticipated to peak at 9000 jobs with central headquarters to be located in Fairbanks.

In April, a U. S. Geological Survey revealed that oil quantity inthe Naval Petroleum Reserve #4 had been wildly exaggerated, as had been earlier Interior Department estimates of Alaska's total resources. Also, a State Legislature Finance study assumed that there would be no major oil finds in the near future and predicted a budget crisis in the 1980s. Subsequently, a major tax severance bill was finally passed which foresaw an increase in state revenue by $350 million over the next three years. The North Pole refinery, which had begun production in August, was seen as another buffer to ease the severe economic situation.

Governor Hammond, in his State of the State Address, expressed concern over the use of the Permanent Fund. He advocated establishing all Alaskans as shareholders in the fund, with formation of a separate management. This drew mixed reactions. A series of debates ensued as to how best to use oil revenue monies and the Permanent Fund. The fund was expected to reach $60 to $65 million by July 1978 and $1.3 billion by 1985. It was seen as one sure way to preserve financial stability when resources were depleted, and also as a way to hold down state spending. Two crucial questions persisted: how fund money was to be spent and how the fund would be controlled.

Numerous incidents marked initial operations of the pipeline: it was opened and closed three times for a total of thirteen days between June and July. Environmentalists (e.g., Sierra Club, Friends of the Earth) claimed that all the incidents on the pipeline had proven the wisdom of their opposition. July 9 marked a black day for the Trans-Alaska Pipeline. A major explosion and fire at Pump Station 8 caused a complete shutdown in operations, and decreased pipeline capacity by one-third, from 1.2 million barrels per day to 800,000 barrels per day when operations were resumed. Due to this, State Natural Resources Commissioner Robert LeResche cited the potential west coast oil surplus to be void. It was not until August that ARCO Juneau set sail with the first load of oil, headed for its refinery in Cherry Point, Washington. Later in the year, this refinery also suffered from a fire which cut oil processing by 30 percent. Sale of Alaskan oil within the state had also been delayed due to the nonestablishment of intrastate tariffs.

There came a surprise disclosure in August from the State Department of Revenue: oil flow would be held to 650,000 barrels per day until the spring of 1978. This decision saddled Alaska with an estimated $100 million in budget deficit: the revenue estimates and state budget had been based on the assumption that the pipe would reach full capacity by the end of 1977.

Bids for the state's royalty oil share continued. The royalty oil sale was perceived by many as unstable because of the requirement that the buyer build a petrochemical plant within the state. Location of the plant was widely disputed: many wanted it in Fairbanks, others nearer the coast, e.g., Kenai. Governor Hammond continued vigorous negotiations with oil companies on the state royalty oil sale project despite state economists' warnings to abondon the project.

In September, the State of Alaska sued Alyeska for violating the Alaska Hire Act, and the case was brought before the U. S. Supreme Court in October. No decision was formulated before the end of 1977.

At the close of 1977, unemployment in Fairbanks had reached an all time high of 19 percent. The State Department of Labor predicted even worse employment figures for the first quarter of 1978, but anticipated an upswing in March at which time the economy would resume its pre-pipeline construction growth rate.

1978

The main concerns in 1978 centered around use of the Permanent Fund. Use of the Fund was viewed as an extremely critical factor in determining the future of Alaska. Arthur D. Little, Inc., a consulting firm hired by the State Department of Revenue, reported that Alaskans would not be able to control future economic growth but could only influence the course of its development. Major long-term industrial development opportunities for Alaska were seen as dependent on world demands, prices, and other resources. Recommendations, therefore, were that part of the Permanent Fund be used to encourage investments by companies from the rest of the United States and for further research to determine the types of industries and businesses most likely to succeed in Alaska.

In early 1978, a report by the Department of Commerce's Division of Economic Enterprise predicted that Alaska would not suffer a major recession at the end of the oil pipeline project. The state had shown remarkable progress in 1977 despite a decline in agriculture and a leveling off of tourism:

overall higher production levels were reached. Alaska's future was considered to be bright, but future growth was perceived as cyclical. The decade of the 1970s was predicted to be dominated by natural resources.

In late March, the State House voted overwhelming approval of legislature to adopt a conservative approach to management of the Permanent Fund. Contributions to the fund from royalties and leases were raised to include 30 percent of royalties and 100 percent of bonuses. Five-sixths of the fund's principal was to be invested in blue chip securities and stocks, and one-sixth (with a maximum of $100 million) would go to the Alaska Enterprise Investment Corporation for loans to small and medium scale businesses and community projects throughout the state.

The Alaska Petrofining Corporation, a Texas-based consortium including six Native regional corporations, won the royalty oil bid after much controversy and compromise. The corporation proposed to build a $2.5 million petrochemical plant facility, to be located somewhere on the Alaskan coast. In a study by ISER, it was found that the majority of people interviewed in Fairbanks favored a gas-based petrochmeical plant in the Fairbanks Borough. This desire was in part stimulated by the decline in oil pipeline activity and the fact that Alyeska Pipeline Service Company was consolidating and relocating employees to Anchorage. Most did not favor, however, expensive aids to petrochemical development such as tax breaks and the sale of tax free revenue bonds.

In May the west coast oil surplus was interpreted as a crisis, and contrary to President Carter's warnings, world oil shortages were predicted as unlikely by the Petroleum Industry Research Foundation.

Gas pipeline plans progressed and expectations concerning its construction were rising. As early as March, gas pipe jobs were being advertised. The Northwest Alaskan Pipeline Company chose Fairbanks as its headquarters after much persuasion from Governor Hammond, and other gas pipeline-related offices were expected to follow suit. In June, the U. S. Supreme Court struck down the Alaska Local Hire Act, but the state proclaimed it would use other means to assure Alaskans were given preferential hire for gas pipeline jobs.

Governor Hammond declared that the North Slope haul road would be opened for industrial use only, with increased access later if demand warranted it. The haul road was expected to stay open year round once the state took over ownership in October.

Thus, Fairbanks faced an uncertain future in 1978 as it did in 1971. Some of the major uncertainties were: when, if ever, would the proposed gas hire be built; how much oil revenues would the state ultimately receive and how would these revenues be spent; when would the haul road be opened for public use; was petrochemical development a viable possibility in Fairbanks; and, of immediate concern, how long would the economic recession created by the completion of the oil pipeline last, and how severe would it be?

APPENDIX B
CHRONOLOGICAL PROFILES OF FIVE FAIRBANKS SERVICE RESPONSES FROM 1968 to 1977

Housing in Fairbanks 1968-1977. A profile of the changing housing situation and the factors that affected the housing situation.

In August of 1967 the Fairbanks area suffered a severe flood and was designated a disaster area by the federal government. Flood damage to businesses and private property was extensive. A housing shortage developed immediately after the flood and persisted for a number of years. The situation was exacerbated by the rapid Fairbanks population increase that followed the announcement in July 1968 of huge oil finds on the North Slope of Alaska. While the U.S. economy was on a down-swing, many were attracted to Alaska hoping to find employment in the expected oil boom. Since Fairbanks was the nearest city to the North Slope most fortune hunters came to Fairbanks.

The business community of Fairbanks was determined that Fairbanks should become the service and supply center for North Slope oil development, for they saw in oil development the possibility of giving Fairbanks once and for all a stable economic base so that it would no longer be subject to booms and busts.

During 1968 and 1969 the business community waged a ceaseless campaign to attract the oil companies to locate their headquarters for North Slope development in Fairbanks. They were informed that the oil companies would choose to locate in a city that provided good services, recreational opportunities and a welcoming attitude. For this reason, those who sought development were very concerned about

Fairbanks' chances to be the center for that development because Fairbanks patently did not have adequate services or recreational opportunities. Along with the inadequacy of school facilities, the housing shortage was the problem that concerned the would-be developers most. In an editorial on February 17, 1969 the Fairbanks Daily News-Miner argued that Fairbanks had prospects for great wealth, but this would only materialize if the oil industry could find satisfactory housing in Fairbanks for its people. This did not exist. The reason for this was because of the tight money situation nation-wide and because of the 8% ceiling on investment returns. The Daily News-Miner felt the investment ceiling to be unrealistic and suggested that the state legislature should raise this ceiling in order to make capital available both to those who would construct apartments for investment purposes and those who needed to borrow money to build their own homes.

In 1968 the population of Fairbanks estimated to be 36,000. Using a ratio of one housing unit for 3.0 persons, this results in a projected need for 12,000 dwelling units. At the end of 1967 ASHA had estimated that there was a shortage of almost 1,000 units. In March and April of 1969 the housing shortage was pronounced to be 'critical' and the Oil Impact Unit of the Chamber of Commerce set up a special Housing Committee to look into needs and solutions to the problem. A shortfall of between 500 and 800 units was identified. Despite the difficulty of financing construction, the market for housing was so good that several projects did go ahead and the City and Borough governments did what they could to promote housing construction by making land available. The greatest need was for rental accommodation, and with demand outstripping supply accusations of rent gouging quickly began to fly about. The low-income and fixed income groups in the population were most affected by the rising rents.

By May it was recognized by the local governments that to meet housing demand during the summer many mobile homes and prefabricated houses would be required. To insure orderly growth and the maintenance of public health standards, the City and Borough worked on writing trailer court ordinances. At the request of the Alaska Congressional delegation, the Department of Housing and Urban Development sent a team to Fairbanks to evaluate housing needs in the face of a population explosion.

In July 1969 a study of housing and of projected housing needs was completed by the Institute of Social, Economic and Governmental Research. This study took into account existing need and projected pipeline impact need and argued that between 1,500 and 2,500 more dwelling units would be needed by 1970. The factor that prevented market forces from producing these units was "lack of investment capital. The Chamber of Commerce took a lead in trying to find outside investors to construct multi-family units. There was some initial success in this venture: an outside company, Tandy Co., was found willing to build 60 units on city land by the end of the year. The city did all it could to expedite agreement on this project and the City and Borough reviewed their building codes to insure that they were not acting as a disincentive to housing construction. In addition the state legislature increased the interest rate ceiling to 10% in an effort to promote construction to ease the housing shortage in Fairbanks and elsewhere in the state. Despite these efforts the housing shortage increased throughout 1969 because of the constantly increasing population.

Although the housing shortage persisted, Fairbanks had, in fact, experienced a residential construction boom in 1969 with a 63% increase in construction over 1968 when 152 new dwelling units had been constructed. In 1969, 240 new units were constructed. The utility companies reported 610 new residential hook-ups in 1969, of which 264 new units were mobile homes. The increase in the number of units did not, however, keep pace with the increasing population.

In expectation of an oil boom and of imminent construction of the Trans-Alaska Pipeline, Fairbanks population continued to increase during 1970. This increase was accompanied by a record number of building permits issued for residential construction - a total of 444 permits were issued, 242 for single family residences and 202 for multi-family residences, but despite this activity and an increasing number of mobile homes the supply of housing remained lamentably inadequate for the growing population. This situation was somewhat alleviated in 1971 when the pipeline delay resulted in a slight decrease in population. The uncertainty over the pipeline project and the over extension of many businessmen during 1969 and 1970 in anticipation of pipeline activity, combined with a tight money market resulted in only limited investment in residential construction although during 1971 money did become available to finance private residential construction. Instead of using the delay period to prepare for the impact that would be generated by the pipeline project, the uncertainty resulted in inaction. During 1971, 348 building permits were issued, during 1972, 439 and during 1973, 446. These levels of construction activity were not sufficient to eliminate the housing shortgage for the existing population. As a result when the go-ahead for the pipeline came in 1974 Fairbanks was again faced with an imminent housing shortage crisis situation.

1974-1978

The year 1974 ushered in a severe housing crisis in Fairbanks due to the commencement of pipeline construction in April of that year. By that time, the population of Fairbanks had swelled to 58.,000 with an estimated need for some 18,000 housing units. The actual number of dwelling units in the area was estimated to be 12,635. The immediate effect of such a shortage was that rents were raised to exorbitant levels.

Instances of rent gouging began to crop up as early as April of 1974. Following a suit against the Chandalar Apartments, tenants formed an association, the Fairbanks Tenant Association, to help protect all renters in the Fairbanks area. Numerous scandals were reported of apartment owners raising rents to ridiculously high levels in order to evacuate the building to enable the owners to rent the entire building to the Alyeska Pipeline Service Company. Such rumors were usually denied by Alyeska.

In the early part of May 1974, Councilman Bob Parsons proposed an ordinance to establish a rent control board and set maximum limits on the rents charged. The idea of rent control resulted in an immense amount of opposition from the apartment owners and managers. The state held public hearings to determine if, indeed, rent controls were really needed. The Alaska Legislature enacted a bill entitled "The Emergency Rent Regulation & Control Act" which became effective on May 19, 1974. This gave the state emergency powers to control rents in areas where housing emergencies existed, although such areas were not clearly defined. Even though rent control legislation was passed, it was quietly pushed aside. Little attention was given to it nor was it enforced. It was not until nearly a year later that the issue was revived.

Meanwhile rents continued to skyrocket and the housing pinch became tighter. The prevailing attitude became one of renting anything available (often substandard in quality) for any price. Few complaints were registered, although a multitude of gripes existed. Fear of eviction kept tenants silent.

Some rental units had no plumbing. Many were overcrowded, which in turn violated zoning ordinance laws. Extreme instances were reported of hallways with a cot renting for $200 a month and one room with no plumbing renting for $500 per month. Some rents were raised as much as $50 to $200 in one month. People seemed to cope by "doubling-up" " although some apartment owners would in turn raise the rent even more.

Rooming houses began to crop up everywhere, even though most areas were not zoned for them. Many failed to meet the fire codes, yet failed to be closed. When asked why health and fire regulations were not enforced, their reply was, "Who are you helping?" Rooming houses were claimed as being "cheap", if you don't mind 45 roommates.

Camp and tent businesses soared. The Chena River Wayside, the only state campground in the metropolitan area, was crammed beyond its capacity during the summer months when pipeline construction was in full swing.

In September 1974, a housing study by the General Accounting Office (GAO) was published. Housing in Alaska was stated to be the poorest in the nation. It was labeled to be worse than in other states due to the fact that houses were more crowded and contained fewer rooms in each unit. The percentage of housing units lacking plumbing facilities was 2.4 times greater than that of other states. In addition, the median value of housing units in Alaska was 34% greater than the national median, and also the median of the cost of rental housing was twice the national figure. Further studies by ISEGR (Tussing & Thomas, February 1975) indicated that Fairbanks was one of the most expensive urban areas in the state.

Military personnel were hard hit in this period, with Fort Wainwright experiencing the most critical housing shortage. Servicemen simply couldn't afford such high off-base prices. By March 1975, the Army found itself with 75 requests for housing. The crisis had been foreseen the preceding fall in this area, but available housing did not literally vanish until just before Christmas. In addition, the base was hurt by a freeze on transfers which meant that no base housing was opening up.

Eielson Air Force Base had been spared from the housing shortage. Requests from air force personnel to bring their families with them to Alaska had been selectively approved and disapproved. A stipulation had been made that a serviceman must have found housing first before a transfer of his family was approved.

A problem in finding housing was also encountered by teachers newly hired by the school district. Mr. Williams, president of the Fairbanks Education Association, commented that the quality of education would suffer if sufficient housing could not be found for the needed teachers.

Mobile home sales had fluctuated. There was a tremendous increase in sales after the 1969 Bonus Oil Lease Sale followed by a sharp decline when pipeline construction was delayed. The year 1975 witnessed a mobile home boom. Half of the housing units added to Fairbanks during the first two years of pipeline construction were mobile homes (1,245 mobile home units were added). There was no competition in this market. One businessman sold $900,000 worth of mobile homes during the first quarter of 1975, with price tags ranging from $25,000 to $55,000. Fifty-four percent of the mobile home owners surveyed said they chose mobile homes because other housing was too expensive, 14% reported no other housing was available. Another problem encountered here was that zoning ordinances restricted the location of mobile homes. During the initial two years of pipeline construction there was a severe shortage of mobile home park spaces. Mobile home owners had little choice in their location: mobile home parks or privately owned land (their own or a friends). Sixty-two percent of the mobile home owners surveyed replied that they had no choice in their location. Single-family dwelling units were permitted in 12 zones while mobile homes were allowed in only 5 and conditionally in another two. Multi-family units were permitted in 10 areas in the Borough, mobile home parks were permitted in only two zones. Although convenience was ranked as the highest advantage of mobile home park living, disadvantages far outnumbered any positive aspects. Among them were overcrowding, poor quality roads, and lack of fire protection.

At this time, dissidence was made public. Controversy and lack of decision continued to exist concerning enforcement of rent control laws that were presently in effect and new ones being formed.

In April of 1975, the first local public meeting was held to air opinions and complaints concerning the rental situation. Landlords were opposed to any rent control ideas arguing that it would only make the housing shortage worse. Tenants continued to remain silent for fear of eviction during such a critical housing crisis. The main messages drawn from the meeting were that the lack of housing was a catalyst to the rental problem and that immediate action should be taken. Mr. Sczudlo, president of Arctic First Federal Savings, said the housing problems came from "the local community having no opportunity to build housing units and the oil companies doing a disservice to the community by not providing for their own housing needs." National inflationary costs were also cited as contributing to the lack of housing construction.

People were pretty much in agreement that rent control would only make things worse: it would further reduce housing construction because investors would be deterred by controls over investment returns and it would also encourage poor quality housing construction. Many existing housing units were already in violation of health and safety standards. Yet most people at the meeting still remained in favor of some sort of rent control.

On March 24, 1975, Governor Hammond imposed the state's Emergency Rent Regulation & Control Act in Fairbanks and Valdez (and later Anchorage). It took the form of a local adjustment board that received individual rental complaints and acted as arbitrator and judge between individual suits of tenant versus landlord. The law required that the local emergency rent review board act within fifteen days of receiving complaint and also required to give reasons for rent increases and, if necessary, let tenants examine their budget records for proof of the need for rent increase. Exempt from such a control were new housing starts commencing after January 1, 1975.

Both pipeline cities (Fairbanks, Valdez) readily approved the emergency rent review board idea. Tony Motley, Department of Commerce Commissioner, described the governor's action as a "rifle approach", aimed at a few (landlords) rather than at all, as were former shotgun approaches. Most people felt along a similar vein, giving much approval and support to the governor's actions - labeling it as "the most reasonable possible solution."

After appointment of emergency rent review board personnel by the governor, troubles began. Local government economists claimed that the regulations proposed by the Alaska Department of Commerce contained major loopholes. In addition, rent review board members found themselves with a majority of rent cases that didn't follow established guidelines. To confound the issue even further, initial rent review regulations and procedures weren't clearly understood by many landlords and tenants.

In June 1975, several changes were effected in the emergency rent review board system. The organization was overhauled and a 3% combined vacancy rate was established as a criterion for determining a critical housing shortage. By July of that same year, the emergency rent review board found itself running out of cases. By some it was even called a joke. "Some claimed that the new emergency rent regulations were still in favor of the landlords.

By October 1975, the emergency rent review board was on the verge of being disbanded because they were getting less than one complaint per week. However, new rent rules were put into effect and rent regulations again became a hot issue.

It was the apartment managers who were gradually forming and effecting new rent regulations. Larger damage deposits were being required and tenants were required to sign rental agreements that had clearly defined regulations. Increasingly, managers began to restrict the allowance of children in apartment units. The Fairbanks Impact

Information Center found that children were not allowed in 52% of the units surveyed, and 89% had a no-pets policy.

In March 1976, the House approved a bill that provided for penalties for violations of the state’s Landlord-Tenant Act and sliced the amount a landlord could charge in pre-paid rent and deposits.

The question of the emergency rent review board continuing was still alive when July 1976 rolled around. On September 9, 1976 Governor Hammond terminated the Emergency Rent Review Board Programs in Fairbanks and Valdez. Rapid population increases were shown to have leveled off and the laws of supply and demand seemed to be back in operation again. Substantial impairment of free choice in residential housing rentals had finally subsided.

Statistics show that between May 6, 1975 and February 28, 1976 complaints were filed against 79 Fairbanks landlords by 150 tenants. Two-thirds of these were related to rent increase, one-third concerned eviction. Only about one-half of these complaints (about 40 cases) were actually settled by the emergency rent review board. The other quarter weren’t even considered due to the landlords not giving proper rent increase notice to tenants.

In April of 1976, rent statistics for Fairbanks still showed a rather broad range in rent; from $125 a month for an efficiency to $650 per month for a furnished 3-bedroom apartment. Inflationary rental prices, though, were gradually on the wane.

The Fairbanks population had risen to 72,037 by 1976. By 1977 it had diminished to 69,578. The housing crunch was over. People in apartments were now looking for houses.

November 1977 statistics were released from the state that indicated building permits had increased 44% over the last year. Anchorage had accounted for 61% of the total, Fairbanks - 21%, and Juneau - 6%. A housing vacancy survey published in November of 1977 by the Federal Home Loan Bank in Seattle indicated a 1.5% combined vacancy rate (1.3% single family vacancy rate). The current vacancy rate as of December 9, 1977 was between 8% and 10% (Sue Fison, Fairbanks Impact Information Center). However reasonably priced good quality housing was still on demand. Mr. Wise, a Fairbanks Developer, commented that he expected Fairbanks to face another housing shortage once the gas line construction gets underway.

1974 and 1975 were the major years of critical housing shortage in Fairbanks. It was not until 1976, with the end of the pipeline construction in sight, that the crisis began to taper off. As the population declined apartment vacancy rates increased, mobile home sales declined, and housing construction began to rise rapidly. There was a boom in the issuance of building permits with 1,561 being issued in 1977.

School in Fairbanks 1968-1977: A profile of changes that took place and factors that affected school development during the pipeline period

When, in 1968, it was discovered and announced that there were extensive oil fields on the North Slope of Alaska, many in Fairbanks welcomed the discovery because of the prospects that the oil offered for the potential development of the city. It was recognized, however, from the outset that certain community services would have to be improved and upgraded if Fairbanks was to attract the desired development.

One of the community services which was considered in 1968 to be less than adequate was the school system. At the beginning of the school year in September 1968 there was an unanticipated jump in school enrollment in the Fairbanks North Star Borough School District. This jump in enrollment posed a problem for the school administration because the existing facilities could only accommodate 6,900 students. This situation had arisen because the Fairbanks electorate had previously turned down a bond issue for school capital construction.

The immediate response of the school administration to the crisis was to transfer some children from school to school, to permit class sizes to increase (some classes were as large as 50) and then to rent classroom space to alleviate overcrowding. Although overcrowding was experienced at all levels in the school system, it was felt most keenly at the high school level. The students at Lathrop High School staged sit-ins during October 1968 to try to persuade the school administration to adopt a double-shift system instead of renting classroom space, but the student view did not prevail.

Once stop-gap measures had been taken to address the immediate problem the school administration had to turn their attention to finding longer-term solutions. In October 1968 the School Board decided to seek for another bond issue for school construction. The justification for doing this was that the school district had inadequate accommodations for existing students even without the expected population expansion that was being predicted in connection with oil development. Further impetus was given to the School Board to seek a bond issue for school construction by the constant admonitions of the local governments and the Chamber of Commerce that community services in Fairbanks must be improved to attract the oil industry to choose Fairbanks as the service center for oil exploration and development. The School Board on October 18 requested a bond issue of $8.6 million to finance a construction program for new schools to accommodate the expanding school population.

The school bond issue was put before the voters on January 14, 1969. In the week preceding the election the Fairbanks media addressed the schools question. The Fairbanks Daily News-Miner of January 7, 1969 described the conditions in the overcrowded schools. The situation had not eased at all since September. It pointed out that although the new Ryan Junior High School would come into use for the next school year, this would not solve the school district's overcrowding problems, though it would go some way to alleviate them. The school district would still need more secondary and elementary classrooms as well as specialized use rooms even to accommodate the existing school population in accordance with the adopted class-size and educational standards.. Should a population boom take place due to economic development the school district would be overwhelmed, not having the facilities to accommodate the current, let alone a rapidly growing population. The Superintendent for Schools (Lafferty) for the Fairbanks North Star Borough School District predicted a continuing need for new school construction programs to keep up with potential population increases. The Business Manager for the school district (Vance) predicted that there would be in excess of 10,500 students in the Fairbanks school district by the 1973-74 school year. The school district administration and the teachers joined together to predict that the school facilities included in the $8.6 million bond issue proposal would be overcrowded almost as soon as they would be occupied. The Chamber of Commerce supported the School Board's request for the bond issue because, they argued, Fairbanks must have good services to attract development. However, the Real Property Tax Payers Association opposed the bond issue. They argued that few would deny the need for more schools but that it was wrong to place the burden for paying for the new schools on the property owners of Fairbanks. The increasing demand, they argued, was largely generated by newcomers attracted by oil-related employment. Most of these people were not property owners, nor would they be long-term Fairbanks residents. Why should the property owners of Fairbanks have to shoulder the burden for paying for new schools for these itinerants' children? The day before the election the Fairbanks Daily News-Miner urged the electorate to 'vote yes for the future of Fairbanks.'

The bond issue, nevertheless, failed. The School Board, faced with the problem of how to continue providing education for an expanding population in already overcrowded facilities with no prospect of new facilities (except those at Ryan Junior High), began to calculate how many portable classrooms to order for September 1969. One School Board member (Ed Price) publicly stated that there would be no problem of overcrowding in the secondary schools in the fall. The new accommodation at Ryan Junior High School would solve that problem, but there would still be a problem of insufficient classrooms at the elementary level. Those members of the School Board who felt the school facilities problem would not just go away began to Investigate the possibility of state funding for the school construction program. The Chamber of Commerce also began pursuing with the legislature the question of state funding for school construction. When it was announced in early February that the Oil would be transported from the North Slope by an all-Alaska pipeline that would pass close by Fairbanks, the probable increase in population that would accompany the construction of the pipeline became a new element in calculating the imminent increases in school population. On February 17 a resolution was introduced in the state Senate to fund education from oil revenues.

During January, February and March 1969 the School Administration and School Board had been working on the preparation of the budget for the 1969-70 school year. The budget that went to the Borough Assembly in March estimated an enrollment of very nearly 7,948 students. To bring the budget down to an acceptable level, the Borough Assembly had the estimated enrollment cut to 7,600, and also cut the per capita estimate of cost. In the wrestle between the School Board and the Borough Assembly over the school budget the School Board argued that the proposed budget was only a minimal maintenance budget and any further cuts would mean a lowering of quality in education, while the Borough Assembly argued that adopting the proposed budget would result in an increase in the mill rate which would be unacceptable.

When Governor Miller visited Fairbanks in late March the Oil Impact Committee established by the Rotary Club seized the opportunity to apprise him of the problems facing the city, including the problem of financing school facilities.

In May it was announced that the state would provide some support to assist the Fairbanks North Star Borough School District. At about the same time the residents of North Pole began to agitate for the provision of more secondary school facilities at North Pole to save the children from that area from having to be bussed to schools in Fairbanks.

In July 1969 the Borough Assembly authorized the purchase of ten portable classrooms in preparation for the new school year. In August the School Board announced that they were investigating the feasibility of a high school at North Pole to serve the residents of that community and Eielson Air Force Base, to be jointly paid for by the federal government and the school district.

Completion of the new Ryan Junior High School in August, well in time for the start of the school year, was greeted with considerable relief by all concerned with education in Fairbanks. Ryan Junior High School was built to accommodate 1,000 students. In another move to alleviate overcrowding in the Fairbanks schools, the School Board decided the North Pole School would include the 8th grade for the first time during the 1969-70 school year. This decision was in compliance with the requests of many North Pole parents. As the start of the school year approached, predictions were made in August that there would be a record number of students, in excess of 8,000, an increase of some 600 students many of whom would have newly arrived in Fairbanks from the lower 48 states.

The reality was greater than the prediction: 8,239 students enrolled in the Fairbanks North Star Borough School District for the 1969-70 school year. Although overcrowding in the elementary schools persisted, a breakdown of the system was prevented because of the new Ryan Junior High facility, the accommodation of 8th grade pupils at North Pole School and the use of some portable classrooms. The School

Administration experienced great difficulty in providing the necessary education within the constraints of the tight maintenance budget that the Borough Assembly had approved.

The announcement by the Governor in January during his ‘state of the state’ message that the state would assume responsibility for 90% of school construction funding was received in Fairbanks with much relief. The budget presented by the governor to the legislature contained provision for extensive school construction to be carried out in time both to accommodate the increased school populations predicted to be associated with the oil development boom, and to precede the construction cost inflation that would inevitably accompany that boom. On receipt of this good news, the school administration once again set about predicting future facility requirements. Against the background of continuing population growth and inadequate services coupled with constant predictions about the potential growth of Fairbanks once pipeline construction commenced it is hardly surprising that their predictions assumed larger future increases in the school district population. The plans to accommodate this influx included a new high school for Fairbanks, a new jointly funded high school for North Pole and Eielson Air Force Base, two new elementary schools, various additions to existing schools and ten portable classrooms. Planning for these proposed facilities continued throughout February and March while at the same time the school administration also worked on preparation of the 1970-71 school budget. When the budget was made public in late March it contained a $3 million increase - but everyone expected that this increase would be borne by the state. The budget announcement was accompanied by a statement on a required building program that would require bonding. This was translated into a $28 million school bond issue to be put before the people at an election in June. The state was to reimburse 50% of the bond issue.

The decision was taken to place the school construction projects on the ballot as nine separate projects, which in the eventual calculation totalled $24 million. The projects were: a high school "in the university area; a jointly funded junior-senior high school at North Pole/Eielson Air Force Base; two elementary schools; a vocational technical complex, and additions and improvements to existing schools.

Because of the delays in the commencement of pipeline construction and the resulting economic uncertainty in Fairbanks, it was predicted in advance that the chances of the full bonding package passing was slim. When the bond election took place in June the package was turned down by a 2-1 margin. The School Board announced immediately upon the receipt of the results that the situation was serious and the School Board would have to seek another bond issue in October. An editorial in the Fairbanks Daily News-Miner of July 2 argued that it was apathy that had killed the school bond issue since only 25% of the electorate had turned out to vote.

When the schools opened for the new school year in September 1970 they were once again overcrowded. One elementary school (Barnette) was so overcrowded that it had to be initially operated on a double session system until the load could be spread amongst other schools. Later in September the School Board held a series of public meetings to sound local opinion on the school bonding issue.

1971-1973

With the pipeline project indefinitely delayed during 1971 there was a down swing in economic activity in Fairbanks. Unemployment levels rose and the population, which had increased significantly between 1976 and 1970 (from 45,500 to c. 50,000), dropped back somewhat to about 48,500. School population also declined, but only very slightly. This situation, however, did allow for the avoidance of the serious overcrowding problems that had faced the School District at the start of previous school years. But although a crisis was avoided, nevertheless, the schools were still overcrowded. Most of the facilities were either at capacity or had up to 100 more students than they were designed to accommodate. Problems of school administration also arose because of the very stringent budget that the Borough Assembly and School Board had adopted. The version that was finally approved had been greatly pared down, the Borough Assembly being willing only to permit a 9% increase over the previous year's stringent maintenance budget. In this the Borough Assembly members were greatly influenced by the prevailingly gloomy economic situation in Fairbanks, while the School Administration had to incorporate pay raises because of inflation.

During the year the School Board became embroiled in a number of behavioral disputes, questions of students smoking, acceptable hair length and at the end of the year the dismissal of the principal of Ryan Junior High School for misconduct. Such matters occupied the School Board while the subject of school facilities was abdicated to the state government since the Fairbanks voters had clearly shown by defeating three bond issues, that they were unwilling to pay for increasing school facilities to accommodate population associated with oil development. The Fairbanks North Star Borough School District started 1972 with problems: the School Board tried to "buy out" the unexpired portion of the school superintendent's (Taylor) term. Taylor resigned. Tension between the School Administration and the School Board had been generated by the Board's decision to reinstate Kesselburg, principal of Ryan Junior High School. The tensions between the Board and the Administration and teachers simmered throughout the year, with charges that the Board was interfering in the day to day running of the schools, but not fulfilling its true role, to develop policies. When the new school year opened in September 1972 the school situation was again saved because enrollment had again slightly declined. But the lack of adequate and sufficient facilities was again highlighted because, due to the dilapidated condition of Main Junior High School, renovations had to be carried out and because of procrastination over the project both by the School Board and the Borough Assembly, this was not done during the summer recess. So the School Administration was faced with the temporary problem of how to accommodate the pupils during reconstruction when all the district's schools were already filled to capacity.

The lack of harmony between the School Administration and the School Board was referred to repeatedly by candidates for the School Board in the September elections. Most candidates felt that this lack of harmony had led to a very negative situation where the School Board spent too much time on minor matters and showed no leadership in educational policy making. Most of the candidates committed themselves to future planning of school facilities to accommodate projected pipeline growth without overbuilding.

A change of School Superintendent early in 1973 (following the resignation of Foutes, who had only occupied the post for nine months) was accompanied by accusations of unfair selection because several board members openly supported the successful candidate (Chuck Smith) who was formerly the principal of Main Junior High School. The School Board also gained a new president during the year, when after the elections David Wood, a new and moderate member of the Board was chosen. The changeover in both these positions made the tensions between the two bodies a thing of the past and promised better relations for the future. Besides as 1973 drew to a close it became evident that the long-delayed pipeline project would indeed go ahead during 1974 which plunged all those involved in education in Fairbanks into a flurry of activity preparing for the long-expected pipeline impact.

Preparing for Pipeline Impact.[1]

From 1969 on, many attempts were made to predict what the impact of pipeline construction would be on Alaska. In 1971 the Institute of Social, Economic and Government Research of the University of Alaska had produced an Alaska Pipeline Report[2], the State of Alaska produced Comments on the Proposed Trans-Alaska Pipeline[3], and the Department of the Interior issued an Impact Statement[4] Alyeska Pipeline Service Company retained Mathematical Sciences Northwest, Inc. to carry out an economic and sociological impact study in 1972.

In the fall of 1973 the Fairbanks North Star Borough School Administration prepared their own impact statement and this was used by the Special Petroleum Impact Committee of the Alaska State Legislature in preparing its Report on Impact of Trans-Alaska Pipeline Construction on Governmental Services and Facilities which was published in February 1974.

In trying to predict what the impact of pipeline construction would

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[1]Much of the information for this section was drawn from Fairbanks North Star Borough Impact Information Center Final Report, Susan R. Fison and Cindy L. Quisenberry, 1978.

[2]Alaska Pipeline Report, Arlon R. Tussing, et. al., ISEGR, University of Alaska, 1971.

[3]Comments on the Proposed Trans-Alaska Pipeline, Department of Law, State of Alaska, July 30, 1971.

[4]An Analysis of the Economic and Security Aspects of the Trans-Alaska Pipeline, U.S. Department of the Interior, Washington, D.C., Dec., 1971

be, all the researchers relied upon Alyeska's own predictions of what employment the pipeline project would generate and how this employment would be distributed along the pipeline. Alyeska's stated intentions on Alaskan hire and on families accompanying construction workers were also taken into account in generating statistics. Since Mathematical Sciences Northwest, Inc. was the consultant that generated figures for Alyeska, their figures served as a partial basis for all other figures. However, not all of MSNW's assumptions were accepted without question. It was assumed in Fairbanks that since MSNW had been commissioned by Alyeska, who was at the time still trying to obtain a permit to construct the pipeline, they would be likely to have minimized potential impact. The Fairbanks North Star Borough School District, on the other hand, faced with growth that would place an intolerable stress on an already strained situation because of the failure of earlier bond issues, would of course be likely to maximize potential impact if this could result in state financing for capital improvements and programs. MSNW predicted at most 2,000 additional students resulting from pipeline impact, while Fairbanks North Star Borough School District predicted an increase of 3,000-3,900 students due to pipeline construction. In fact the school population rose by only just over 1,000 students between 1970 and 1977 - the peak figure reached in 1975 was 9,675 compared with a peak of almost 12,000 predicted by Fairbanks North Star Borough School District. Actual school enrollments more nearly approximated the “normal” levels anticipated if construction of the pipeline had not occurred.

The School Administration calculated that they would need 148 more classrooms and 50 more teachers. In applying for pipeline impact funds, the Fairbanks North Star Borough School District requested $230,000 for extra administrative costs, $2,600,000 to cover educational costs for extra students, $526,500 for relocatable classrooms and purchase of $12,475,000 in Fairbanks North Star Borough School bonds by the state. The state legislature appropriated $1,504,300 in impact funds to the Fairbanks North Star Borough School District for the year 1974-75.

The Reality of Pipeline Impact - 1974-1977

In the spring of 1974, just prior to the official commencement of pipeline construction, the Fairbanks North Star Borough School District operated 13 primary (kindergarten through sixth grade) schools, including two one-room schools and three special education facilities, as well as two junior high schools (grades seven and eight), one high school, a career extension center and a vocational school. The school district had 437 certificated employees and 196 noncertificated employees. Schools were overcrowded since no school bonds had received voter approval in eight years.

Three years later in the spring of 1977 the school system had expanded to include not only schools on the military reservations (two grade schools and one high school) but also five newly constructed schools: two elementary schools, two junior high schools, and one high school. School district employees in fall 1977 numbered more than 1,125, 670 of which were certificated employees.

In addition to bonded indebtedness from the new schools, the Fairbanks North Star Borough school budget for non-military base schools increased by 89 percent, from $14.8 million in 1973-74 to $27.9 million in 1976-77. With hindsight, the growth in the school system may seem irrational when compared to a total growth in student enrollment at the non-military base schools between fall 1973 and fall 1977 of only 10 percent. However, decisions to expand the school system were based upon rational planning for pipeline impact. All of the planners--for the school district, the state, and the oil companies--asserted that there would be a massive influx of school age persons into the community as a result of pipeline construction. The projected school enrollments became the basis for decisions to expand the school system; however, the enrollments never materialized."[5]

The school system was extensively reorganized to cope with the expected impact when the school year commenced in September 1974. Over 100 new teachers were hired, a portable classroom elementary school opened at Fox, McKinley Elementary School on Fort Wainwright was leased by the Fairbanks North Star Borough School District to serve as a Junior High School for North Pole students, University

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[5]Susan R. Fison & Cindy L. Quisenberry, Impact Information Center Final Report, (Fairbanks North Star Borough, 1977) Chapter V p 1.

Park Elementary School was to be operated on a double-shift system, and Lathrop High School was to operate as two separate high schools based on a double-shift system. Although in excess of 11,000 students were expected to be accommodated within these arrangements during the 1974-1975 school year, only 9,000 students materialized. Nevertheless, some schools were reported to be at capacity and the double-shifting at Lathrop and University Park created an air of coping with difficult circumstances that led those involved to believe that extensive pipeline impact was a reality.

During the pipeline period five new schools were added to the existing facilities of the Fairbanks North Star Borough School District: the temporary portable Fox Elementary School added in 1974, Tanana Junior High School - added in 1975 to replace North Pole Junior High, West Valley High School added in 1976 and Wood River Elementary School added in 1976. Tanana Junior High and North Pole Junior/Senior High Schools had been authorized by the electorate through a bond issue election in October 1973, prior to the granting of the pipeline construction permit. Two new school bond proposals (for West Valley High School and Wood River Elementary School) were put before the electorate in November 1974. With the assurance that the state would bear most of the cost, these bond issues passed.

Despite the passage of these bond issues Fairbanks schools were overcrowded during the 1974-75 and 1975-76 school years, but this was not so much due to pipeline impact as to failure to pass bond issues between 1968 and 1973 to address growing population and obsolescence of old facilities. There was some pipeline impact: during 1974-75 there were about 500 new students, and during 1975-76 a further 700 new students, but not the 3,000 to 3,500 that had been anticipated. There were some complaints about overcrowding and about double-shifting between 1974 and 1976, but the arrangements were made to work. The availability of four new schools to accommodate students for the 1976-77 school year largely obviated problems of overcrowding and brought an end to double-shifting. The necessity, when these new schools became available, for redrawing the school attendance areas to make them more appropriate to the facilities available, drew some criticism because the boundaries had been adjusted annually since 1974 to cope with pipeline impact and over-crowding.

Peak enrollment during the pipeline years was experienced in 1975-76 when a total of 9,765 students enrolled. When the new schools became available for the 1976-77 school year the student population had already begun to decline with a total of 9,666 students that year.

With the addition of the new facilities in 1976, the Fairbanks North Star Borough School District had a total student capacity of 11,225 students based on 25 students per classroom. But in a letter to the Borough Mayor in April 1976 a school administrator explained that the actual capacity of the schools was less than 11,225 because that figure was based purely on 25 students per classroom and not on the actualities of school program scheduling - such as smaller groups for special education and necessary library and multi-purpose space to meet accreditation standards. In addition, the use of temporary portable classrooms should be eliminated. Such adjustments reduced the actual capacity of the school facilities to a little over 10,000. With a peak pipeline period enrollment of just under 9,700 during the 1975-76 school year, this allowed for excess capacity of some 300 places distributed throughout the system.

Although the growth in student population during the pipeline construction period was far less than anticipated the Fairbanks North Star Borough School District budget increased by leaps and bounds because the budget anticipated need for facilities, teachers and administrators to cope with predicted population, and the resulting increase in the number of facilities generated a need for administrators and teachers to staff them.

In fact what happened was that the Fairbanks North Star Borough School Administration planned to accommodate the predicted influx associated with the pipeline construction, but when the immense influx did not materialize, used the funds and facilities that became available to upgrade the school system from a stressed and overcrowded system to an adequate system for existing population.

That the School Board in 1976 with four new permanent facilities, debated building four more permanent facilities, even though the estimated student population growth had not taken place, is surely just an indicator of how overstretched the situation had been in 1974. School capacity calculations are based on class size or student-teacher ratios. The Fairbanks North Star Borough School Administration in its request for impact funds stated that it maintained a ratio of 1:23 for grades one to eight and 1:18 for grades nine through twelve. Obviously the overcrowding of facilities prior to the commencement of pipeline construction must have rendered these standards beyond realization. However, construction during the pipeline period put the standards once more within the bounds of realization.

In January 1977 the Impact Information Center issued a report that addressed the subject of school facilities. In this report it was pointed out that the Lathrop High School population would have to be lowered to qualify for accreditation, so a fourth high school would be needed in Fairbanks in the Chena Hot Springs/Steese Highway Area. The report also argued that new elementary schools would be required in the future at North Pole, in the Steese Highway Area, at Fox and at Two Rivers; but the report also predicted that there would be a reduction of the number of teachers employed if the current teacher:student ratios were maintained, because of a declining student population.

Conclusions

Despite ample opportunity to prepare for the impact of the pipeline construction, the Fairbanks electorate was unwilling for school construction to commence in advance of the certainty that the pipeline project would take place. Despite urgent calls by pro-development groups to upgrade services to attract oil industry activity to Fairbanks, school bond issues were consistently defeated. This resulted partially from uncertainty about the pipeline going ahead, and partially from unwillingness on the part of the property-owning taxpayers to support heavy tax increases for the construction of schools to serve a population that would be transitory, while the tax burden to maintain these facilities would be permanent.

The outcome was that Fairbanks schools were unprepared to deal with the predicted impact had it come. The arrangements made for the 1974-1975 school year to cope with the predicted impact were frequently found to be irksome and cumbersome. This brought the reality of school needs to the attention of most of the population. At the same time the State of Alaska made impact monies available and accepted financial responsibility for 90% of capital costs for education and a greater proportion of administrative costs than formerly. In October 1973 and November 1974 school bond issues were therefore passed by the electorate. During the 1974-1976 period four new permanent schools were constructed. These schools were constructed at a time when the Fairbanks economy was humming with pipeline related activity. Construction costs were therefore at a peak, whereas had the facilities been constructed between 1971 and 1973 their construction would have provided much needed activity for the depressed Fairbanks economy and their cost would have been much less.

School construction undertaken during the pipeline period, far from resulting in excess capacity in the school district, merely permitted the school district to correct earlier overcrowding, to replace obsolete facilities, and to attain teacher-pupil ratios in accordance with their claimed standards. The school budget increased because of these improvements and because of increased administration and maintenance budgets for the extra facilities.

Health Services in Fairbanks 1968 - 1978: A Profile Describing the Changing Structure of Health Care During the Pipeline Period. Descriptions of the Services Provided for Mental Health and Alcoholism are Also Included.

Health care in Fairbanks showed steady improvement through the decade 1968 to 1978 and was ranked number three on the list of best assessments of the community by those sampled in the Fairbanks Community Survey (Jack Kruse, Institute of Social and Economic Research, University of Alaska, December, 1976).

"Prior to pipeline construction there was little analysis of potential impacts of the project on health care in Fairbanks. In 1972 Alyeska Pipeline Service Company released a report which predicted impacts of construction on the pipeline (A Study of the Economic and Sociological Impact of Construction and Initial Operation of the Trans-Alaska Pipeline, prepared for Alyeska Pipeline Service Company, Inc., by Mathematical Sciences Northwest, Inc., September 1972). The study predicted that the state would need 60 to 70 additional non-federal physicians and more hospital beds. The report said that 2,000 more hospital beds would be required statewide by 1970, even without pipeline construction (Ibid., Vol. II, pp. 143-144). While the study suggested that there would be additional demands for both physician manpower and hospital beds in Fairbanks, it did not specify how many of each would be needed."[1]

I. PRIVATE HEALTH CARE

Most private physicians were members of one of two competing clinics

(Tanana Valley Medical Clinic and Fairbanks Clinic) in Fairbanks during the decade prior to pipeline construction. Doctors from both clinics received both a salary and a portion of the profits from their respective clinics. "Since there was a strong financial incentive to keep business away from the competing clinic, it was not uncommon for doctors to refer patients to specialists in Seattle rather than across the street."[2] Because of this practice and due to Fairbanks' fairly small size, there were relatively few medical specialists prior to the pipeline.

In anticipation of the activity generated by pipeline construction, however, clinics increased their staffs. Opening of the Fairbanks Memorial Hospital in 1972 and the emergence of the independently based Medical and Dental Arts Building in 1973-1974 were both responsible for attracting new medical professionals, viz., specialists whose skills were specific for the former, and physicians who didn't want to be a part of the two clinics and preferred an independent association with the latter.

A. 1968- 1971

(No information for this period save what was mentioned in the beginning paragraph under private health care on page 1.)

In January 1970, Senator Jay Kertula prefiled a bill that would authorize physicians assistants to assist practicing physicians in urban areas to relieve a shortage of doctors and to bring physicians' services to remote areas.[3]

B. 1972- 1973

In 1973 the two local clinics increased their staffs to a combined total of 39 private physicians representing 10 specialties in order to prepare for anticipated pipeline related population increases. Twenty-eight percent of the doctors (11) were affiliated with Tanana Valley Medical Clinic; 49% (19) at Fairbanks Clinic; 18% (7) other; 5% (2) with Fairbanks Memorial Hospital.[4]

Prior to the commencement of pipeline construction, in addition to increasing its staff, the Fairbanks Clinic also expanded its facilities. A $1 million expansion program was begun in October 1972 and completed in May of 1973. The expansion allowed for an increase in the number of doctors and an additional 8,000 square feet making a total of 35,000 square feet of space in the medical building for the clinic. Suites for ear, nose and throat, expanded orthopedic, physical therapy, and industrial medicine departments and administrative offices were added. Expansion also included an enlarged outpatient surgery center. Although six more doctors were expected to bolster the ranks during the summer of 1973, the clinic had, by 1972, initiated a double shift schedule to avoid the necessity of hiring any additional physicians.

The structure of private health care in the community was altered significantly by the decision of some physicians to provide a health care alternative to the two clinics in Fairbanks. In 1973, several doctors severed affiliation with the clinics and began construction of the two-story Medical and Dental Arts Building designed to house independent physicians and small specialty group practices. Amelioration of the private health care structure was accomplished through the intervention of private individuals (doctors) and so, the changes took place with relative expediency.

C. 1974 - 1976

As pipeline construction began in 1974, the 14,250 square foot Medical and Dental Arts Building was completed at a cost of $3.5 million.

The number of physicians in Fairbanks continued to grow with 47 private practitioners in 1974 representing a wider range of specialities. "The increase in the number of physicians may be attributed to . . . the opening of the new Fairbanks Memorial Hospital, which attracted those with hospital based specialities and to the emergence of the Medical Arts Building alternative to the two clinics which had dominated health care in Fairbanks."[5]

When pipeline construction commenced, the Tanana Valley Medical Clinic was granted the contract "to provide medical services under the Teamsters Union pre-paid medical plan, which accounted for about 15% of the clinic's patient volume."[6] When Teamsters Local 959 considered building a hospital in Fairbanks (in 1975) their plans originally included a new medical clinic with about 30 doctors to serve Fairbanks Teamsters. The idea was later rejected and the Tanana Clinic retained their contract."[7]

Although the Fairbanks Clinic received the contract from Alyeska in May 1975 to provide approximately 120 pre-employment physicals per day (or a total of 19,096 between May 1, 1975 and April 30, 1976) for pipeline workers, the clinic did not hire additional doctors. They accommodated the load through doctors working overtime following shift work. These physicals provided more than $1.2 million each year of pipeline construction. At the same time, "Fairbanks Clinic experienced a 30%' increase in patient load, exclusive of pipeline employment physicals . . . "[8]

More patients and big contracts spurred the clinics into expansion and construction of new quarters.

"In 1976, three floors were added to the Tanana Valley Medical Clinic, an addition of 40,000 square feet . . . The Clinic used only 14% of the 40,000 square feet of new office space for its operations and anticipated renting space to professionals who were not physicians."[9]

"The Fairbanks Clinic also constructed new office space. Due to a dispute with the owner of the downtown building which previously housed the clinic, the clinic's lease was terminated on July 15, 1976 with only 10 months notice. To insure that their new building would be ready for occupancy before their old lease expired, the doctor-shareholders of the Fairbanks Clinic built a facility utilizing modules built in Oregon and shipped to Fairbanks. The new $4 million facility contained a 40,000 square foot medical clinic, about one third larger than the former downtown clinic."[10]

Because founders of the Medical and Dental Arts Building determined from the outset that their purpose was to concentrate on serving local Fairbanksans, a higher proportion of the community did indeed visit and utilize the facility. Because the number of patients continued to grow, construction of a second two-story building adjacent to the original building was begun in 1976. Expansion of the complex (by 15,550 square feet) came at a cost of $4.9 million. "Thirty percent of the building's office space was leased by non-medical professionals."[11]

"Thus, during the course of pipeline construction, private medical doctors in Fairbanks financed the construction of about 100,000 square feet of professional office space, of which 60% is used for medical practice."[12]

"By 1976, there were 57 private physicians in Fairbanks representing 12 specialties. Over a third of the doctors were practicing independently of what were formerly the two major clinics. The net result was a significant change in the power structure of the medical community. The traditional style of competition was altered as large contracts, rather than individual patients, became the prize."[13]

"It appears that the demand for health care grew faster than the population of Fairbanks. This may be attributed to growing affluence in the community which enabled people to seek private health care more readily, increased employment and employment-related medical insurance and the availability of a greater number of specialists in Fairbanks which people could consult rather than leaving the community for that service."[14]

Also, during 1974 the Fairbanks Health Center (a City of Fairbanks and State public health clinic offered to the public free of charge) patient load increased by 10,000 visits compared to 1973. Contributing to the rise was that the number of tine tests (required by the City of Fairbanks for all culinary workers) administered increased three-fold in 1974 over 1973. About 50% of those receiving tine tests were on their way to the pipeline and a quarter had lived in Alaska less than a year. In addition to the increased workload relative to testing, many children of new families in the area were not sufficiently immunized prior to moving to Alaska.

Venereal disease screening tests increased at a 28% greater number in the summer of 1974 over 1973 although " . . ..the number of positive cases identified increased by less than 5%."[15] The state laboratory load of syphilis serologies performed increased " . . ..from 4,745 for the 6-month period April through September 1973, to 12,892 for the same period in 1974 in direct relationship to the number of pipeline physical examinations performed."[16] "Tests which identify gastro-intestinal disorders increased by 34% in the first six months of pipeline construction as compared to the same period in the previous year. The number of positive enteric tests increased by 102%, perhaps a reflection of sanitation conditions."[17] During the first six months of pipeline construction in 1974, the laboratory performed 32% more tests on 36% more specimens than for the same period of time in 1973. "Laboratory supervisor Wayne Miller said the lab's workload has not fallen off with the end of the pipeline construction phase, primarily due to a federally funded program aimed at eradication of venereal disease which has received emphasis in Alaska."[18] Mr. Miller attributed the high incidence of venereal disease to "the youthful population, large percentage of unmarried people, high rate of alcoholism promoting promiscuity, and a greater number of cases being reported to state public health authorities."[19]

11. HOSPITAL

A. 1968 - 1971

In 1967, the old St. Joseph's Hospital received considerable damage from the flood. Nevertheless, a bond issue for a new hospital was subsequently defeated. By 1968 the city had taken over operation of the hospital and renamed it the Fairbanks Community Hospital. The

Greater Fairbanks Community Hospital Foundation then sparked a community-wide fund raising effort towards construction of a new hospital. The moral and dollar support from the public was strong enough that it contributed to Fairbanks winning the All-American City title.

During the first part of January 1969, the hospital foundation received a $1,774,700 grant from the Economic Development Administration in Washington. Members of the executive committee of the foundation gave assurances that without a doubt, Fairbanks would have a new modern hospital. By January 21, City Council approved the new hospital site. Councilman Harry Porter said that, "The new community supported hospital won't be an overnight occurrence, but will begin to take shape in the near future and construction planning is progressing well."[20]

Initial schematic plans for the hospital were unveiled in February 1969 and final drawings were projected for completion in November 1969. Department of Health approval was hoped for by January 1970 with construction to begin in the spring of 1970. Local pledges in 1969 amounted to $1.9 million. An additional $1. million was approved by the federal Hill Harris Hospital Fund that same year. By August, final preliminary design plans for the hospital were completed and approved and the architect was authorized to proceed with final construction plans. While final plans on the new hospital were being designed, the old Fairbanks Community Hospital was experiencing overcrowded conditions with its 64 beds filled. Six patients were being treated in the hallways and former sun rooms on the second and third floors had been converted to rooms.

By February 5, 1970, the HEW approved revised plans for the estimated $8 million hospital facility. At that time, the building fund was $800,000 short of $8 million. Acceptance of bids of hospital construction began in February nevertheless. Local Business and individual pledges reached $2 million with more than $1 million in the bank from those pledges. Despite positive efforts in fund raising, members of the hospital foundation expressed uneasiness with the fact that final approval for the hospital might be delayed because of the multiple approvals needed from various agencies (final release of federal funds comes about through a chain of approvals - it is required that the city must first give its approval to the state, and then the state in turn to the federal government.) This could have resulted in a one year construction delay. However, final approval came in April 1970 and construction work commenced April 25. The construction firm predicted that completion of the project would be accomplished prior to the contract agreement of 665 days.

The Fairbanks Community Hospital, meanwhile, was ready to face the Joint Commission on Accreditation of Hospitals in February 1971 (60% of the hospitals in the U.S. meet the commission's standards.) Measures include inspection of each aspect of hospital departments and patient care. The FCH failed to receive accreditation in 1968 because of fire safety violations. Hospital administrators expected heavy criticism from the commission on its overcrowded conditions. The 67 bed hospital normally experienced over 80% occupancy.

By December 1971 the hospital foundation had received 83% of the $2 million community effort; $1.5 million from the State; $1 million from Hill Harris; and $1.4 million from Indian Health. Hospital dedication was set for February 13, 1972.

B. 1972- 1973

When the Fairbanks Memorial Hospital opened in April 1972, the four-story, 88 bed facility was debt free. The community raised $2.6 million which was matched by $6 million in state and federal funds.

During 1973 the occupancy rate was 55.6%. "Eighty percent is considered desirable for hospitals. This is the financial break even point, below which costs per patient increase to support the hospital expenses."[21] "Most hospitals find 80% occupancy the maximum limit for effective functioning, since greater levels of utilization create problems of patient mix."[22]

C. 1974 - 1976

"By 1974, the hospital added 28 orthopedic beds on its third floor. That year the 116 bed hospital experienced a 67.7% occupancy rate.

It was anticipated that the hospital would be able to accommodate the Fairbanks Community for several years, with expansion being unnecessary before 1978."[23] When pipeline construction began, the hospital averaged less than 2 admissions per day for pipeline related cases and approximately 5 pipeline related inpatients at any given time. It was anticipated that most accident victims would be evacuated to Anchorage, so hospital administrators did not see a need to plan for pipeline impact."[24]

Hospital admissions increased by 35% during 1974. Contributing to increased patient loads at Fairbanks Memorial Hospital was the influx of military persons formerly treated at Basset Army Hospital. In 1974, military physicians dropped in number from 17 to 9. "This alone created a 50% increase in obstetric cases in FMH."[25] The hospital's medicare patients more than doubled, due more to the "wide range of services available rather than to increased eligibility for medicare."[26]

Much more significant to greater demand on hospital services was the changing factor of utilization. "Because the structure of the medical profession changed, the population expanded, and the number of medical specialists increased in Fairbanks, the local hospital was utilized in a different way. More types of surgery were performed in Fairbanks instead of being referred to Seattle. In addition, persons injured while working on the pipeline north of Fairbanks and south of Isabel

Camp were evacuated to Fairbanks Memorial Hospital. From May 1, 1975 to April 30, 1976, a total of 1,283 medical emergencies were sent to Fairbanks hospital from pipeline camps, an average of 3.5 medical evacuations per day."[27] Between 1974 and 1975 there was a 241% increase in ambulance runs largely attributed to the number of pipeline or pipeline related workers picked up at Fairbanks International Airport and transported to the hospital. Alyeska contracted with the city to provide injured pipeline workers transportation from the airport to the hospital. Ambulance personnel claimed that many of the persons they transported from the airport were not real emergency cases.

A former hospital director "observed that another factor relative to greater hospital utilization was greater wealth in the community which meant more people sought elective surgery and more Native people chose to use private health care instead of Alaska Native Hospital Services."[28]

. Because the number of nurses did not grow in proportion to the increasing number of admissions and physicians, nurses were overworked. The hospital found it difficult to get more nurses because wages were low in relation to the many other higher paying jobs in the area. In reaction to this state of affairs, nurses went on strike for 5 days in 1974. "Although the Alaska Nursing Association was not recognized as a collective bargaining unit, a pay raise was granted and elective surgery was restricted to reduce the patient load until more nurses could be hired. Because of better pay elsewhere, a high turnover rate was experienced among less skilled hospital personnel."[29]

In addition to delaying elective surgery, doctors coped with the increased demand for inpatient health care by moving patients out of the hospital a little more quickly and by utilizing the extended care facilities of the local private convalescent home, Careage North (Alyeska leased 10 of the 103 beds to house pipeline workers needing medical care) for hospital overflow. As a result, Careage North experienced a 90% occupancy rate and realized a need for expansion. However, expansion did not take place because of a leveling off of occupancy at 80% later on. Immediate demands forced conversion of two day rooms, a father's waiting room, and doctor's dressing room into 12 additional patient beds in 1975. The demand, nevertheless, continued to threaten the supply.

On top of increased need for inpatient services, the hospital's emergency room was deluged with activity. "Prior to the pipeline, the two clinics in town effectively opposed any emergency room services provided by the hospital. Hence, the emergency room was not staffed and patients were required to call their doctors, or a doctor from the same clinic, to meet them at the hospital emergency room. Each of the two clinics had a doctor on call for emergencies. Unknowingly, many newcomers assumed that Fairbanks had the emergency room services of a general hospital. Both because they did not have family doctors in Fairbanks, and because many types of health insurance cover hospital visits, but not office calls, many of the people new to Fairbanks sought routine medical care from the hospital emergency room. The emergency room was" flooded by persons in need of alcohol detoxification. About the time that pipeline construction began, the community eliminated its drunk laws and the local alcoholism program eliminated its detoxification services. As a result, people who were seriously inebriated were taken to the hospital emergency room. The emergency room was also the recipient of more medical emergencies during the pipeline period, as there were more traffic accidents, fires, industrial accidents, and psychiatric traumas."[30]

Along with the emergency room, an increase in the utilization of other specific hospital services occurred. "While the intensive care unit had a greater occupancy rate during the pipeline construction, it was not greatly overloaded. Hospital director Tom Mingen attributed this to cardiac screening in the pipeline pre-employment physical examinations, which eliminated many potential cases of heart failure . . . Industrial accidents on the pipeline contributed primarily to orthopedic case loads which are reflected in the increased utilization of physical therapy services. The rise in radiology and nuclear medicine procedures may be attributed in part to national trends relating to improved technology and medical knowledge. Furthermore, during the pipeline construction period, the hospital obtained new equipment which made available diagnostic procedures including ultra-sound, zero radiography, and electroencephalograph. Although there was a sharp increase in the utilization of hospital laboratory tests in 1974, the number declined to 1973 levels during 1975 and 1976. The explanation for this may be that the clinics provided a greater proportion of the laboratory tests than they had previously."[31]

When hospital occupancy hit 86.0% in 1975, it was clear that expansion planning was appropriate. "At first planning efforts were delayed because of uncertainty about the health care plans being developed by the Teamsters."[32]

"The growth in union membership and trust funds has made it more economically feasible for the Teamsters to provide health care services directly to the membership rather than contracting the services, (and so) in 1975 the Teamsters Union considered building a hospital in Fairbanks.

Directors of the Fairbanks Memorial Hospital were concerned about a second hospital in the same community. They felt that two hospitals would drive up the cost of inpatient care, particularly for Fairbanks Memorial Hospital, which must accept Medicare and Medicaid patients. Since Teamsters hospital would be a private institution, it would siphon patients whose bills fully cover expenses and not incur the financial loss from Medicare and Medicaid patients. In addition, the Teamsters hospital would reduce the number of patients at the Fairbanks

Memorial Hospital and possibly cause under-utilization of specialized facilities. Since there was a definite need for more hospital beds in Fairbanks, and Fairbanks Memorial Hospital was in the process of making expansion plans, they invited the Teamsters to participate in the expansion of the existing hospital. Before accepting the plan, Teamsters insisted that they have adequate representation on the Board of Directors of the Fairbanks Memorial Hospital (controlling interest). This offended most board members who regarded the hospital as a community effort which ought not to be controlled by any special interest. After initial negotiations failed, the Teamsters continued plans to build their own hospital in Fairbanks. More than any other event during the pipeline period, this could have changed the structure of health care delivery and the power structure of the medical community in Fairbanks."[33]

Despite Teamster plans to build a $12 million, 100 bed hospital, the Fairbanks Memorial Hospital Foundation proceeded with groundbreaking ceremonies on June 16, 1976 for the $9.7 million hospital (Phase I) addition to include enlargement of laboratory, x-ray, emergency room, surgery, and other ancillary departments, such as the business office. In July 1976 a hospital consulting firm, contracted by the Hospital Foundation Board, issued a report emphasizing the conclusion that a second hospital in Fairbanks at that time would be a disservice to the community and could not be justified unless the population base reached a figure of 200,000. By October 1976, a site was selected by the Teamsters for their hospital. However, the Fairbanks North Star Borough's Planning and Zoning Commission opposed the construction and the Teamsters subsequently reconsidered their plans to build a separate facility.

"The Hospital Foundation and the Teamsters instead negotiated a proposed $20 million rehabilitation center adjacent to the hospital. The proposed rehabilitation center would service various types of patients including those recovering from surgery, trauma victims, alcoholics, and those suffering from heart or lung diseases . . . the resultant agreement signed in December 1977, eliminated the possibility of a separate Teamsters hospital and also gave the Hospital Foundation the option of not using Teamster money if less expensive sources of financing could be found. The proposed Teamster-financed rehabilitation center has been termed Phase II of hospital expansion, to distinguish it from Phase I of hospital expansion for which a community fund drive was conducted to finance construction."[34]

"More subtle potential long-term effects of the increased number and percentage of people in Fairbanks who were eligible for industrial and union health care insurance was the shift in emphasis from acute care to preventive medicine, greater access to and utilization of health care institutions, an expansion of the medical industry in Fairbanks and, possibly, better health for Fairbanksans."[35]

D. 1977 - 1978

In addition to the Phase I hospital department enlargements, a 29-bed special care unit is being constructed to include 7 intensive care units, 7 coronary care units, and 15 intermediate step-down (post-critical care) units. This will give the hospital a total capacity of 155 beds.

"By August 1977, the hospital addition fund drive had identified the following sources for possible future funding for Phase I;

Savings from previous fund drive	$1 million
State of Alaska	$3 million
Alaska Native Health Service	$1 million
Private donations	$3 million

By January 31, 1978, the private donations totaled $3.1 million. Approximately 22% of the private donations, or $690,000, came from . pipeline related companies and unions. In addition, Alyeska Pipeline Service Company donated an $8,000 remote electrocardiograph to the hospital. The equipment was purchased originally to give information about heart patients from distant pipeline construction sites. The equipment was not used extensively since electrical interference resulted in poor readings; however, the hospital may use it in ambulances in the future.

In considering the future, hospital administrator Tom Mingen believes that Phase I construction will result in an 80% occupancy rate for the hospital. While he believes that the addition should be sufficient for the next several years, he thinks that construction of the gas pipeline might once again put the hospital in a crowded situation."[36]

CONCLUSION

"Unexpected impacts of pipeline construction on the health care industry illustrated the importance of structural analysis in predicting impacts. By postulating a direct relationship between population size and the need for hospital beds and health care professionals, the health care industry in Fairbanks was deemed adequate and no impacts were anticipated . . . however, changes in the structure of the health care delivery system and other aspects of the community caused the hospital and long-term care facility to be inadequate and changed the demands for health care manpower."[37]

111. MENTAL HEALTH AND ALCOHOLISM

Introduction

A high incidence of poor mental health and alcoholism existed in the Fairbanks community prior to the pipeline project. These characteristics are not the direct result of the harsh physical and social environment as is traditionally held. Those working in the mental health field see the North country as functioning differently in relation to its influence on mental health. The arctic region (and subarctic), viewed as the last frontier by many, attracts people who feel that maybe they can make a success of themselves or start a new life in this remote area with its romanticized pioneer quality of life. This escape from a former life brings the desired result for some, "but others find they cannot escape from their problems by moving to another location. Alcoholism may be a manifestation of this need to escape."[38]

Isolation from the support traditionally provided by the extended family contributes to emotional stress for many civilian immigrants as well as persons in the military who are often subject to an unusual degree of stress typical of their situation.

Because of the built-in need to cope with living conditions in Fairbanks under normal circumstances, Fairbanks residents were able to cope relatively well with changes in the community as a result of pipeline impact.

People benefited from knowing that the impact would be temporary. The period of fast-paced construction had a well-defined time frame of 3-4 years. Even before construction, Fairbanks residents were used to coping with a transient population. The town was also historically familiar with the boom and bust phenomenon. "Thus, many changes in the community from pipeline construction were changes of degree rather than kind of problem. The major kinds of new problems facing Fairbanksans were changes in roles and values."[39]

A. 1973 - 1976 (Mental Health Services)

Associated with the Fairbanks and Tanana Clinics in 1973 was one psychologist and one psychiatrist in private practice.

"Fairbanks Crisis Line is an anonymous telephone crisis intervention, information, and referral service. Crisis calls increased from 29% of all calls in the spring of 1973 to 49% of all calls in the spring of 1975. More than five times as many people called Crisis Line in suicide-related contacts in the spring of 1975 than during the same period of 1973. During the year from May 1974 to April 1975, 396 of the more than 6,000 calls received by Crisis Line were related to problems directly caused by pipeline impact, such as housing, or spouses or parents absent due to pipeline employment. While the changing use of Fairbanks Crisis Line might have reflected changing mental health needs in Fairbanks, the increased number of calls might also have been related to the increased awareness and acceptance of this mental health facility. The declining percentage of calls from people who were lonely and wanted to talk with somebody may have resulted from people being busier and having less time to be lonely. The director of another counseling center observed that people had less time to focus on themselves and dwell on their own problems. At the same time, he noted, people had less time to spend with each other to 'negotiate' relationships."[40]

By 1975 hospital psychiatric admissions reached a peak that corresponded to the height of pipeline activity. Disorders most representative of the upsurge were psychosis, neurosis and personality disorders. These three types of mental disturbances increased by 75% from 1974- 1975. "The growth in this type of psychiatric admission to Fairbanks Memorial Hospital may be attributed not only to increased stress in the community but also to increased private mental health practitioners which enabled people to stay in Fairbanks for treatment rather than leaving the community."[41]

By 1976 the number of psychologists and psychiatrists increased to two each. On June 28, 1976, Fairbanks Memorial Hospital opened a six-room psychiatric unit, the first private psychiatric facility in the state. Those disorders mentioned above showed a 6% decline in 1976.

The Fairbanks Mental Health Clinic staff (composed of persons trained in psychiatry, psychology and social work) remained the same during the peak of pipeline activity, although the caseload jumped by 40 to 50%. "Mental Health Clinic Director Jack McCombs attributes the increased caseload primarily to court-ordered evaluations. Patterns in mental health problems at the Fairbanks Mental Health Clinic did not change during pipeline construction -- the problems remained substantially the same, with more of everything. McCombs attributes the consistent patterns of utilization of the clinic to the growth of the private sector. According to McCombs, pipeline workers and their families would be unlikely to use the state supported Mental Health Clinic."[42] The rise in the number of cases might also be attributable to stress related to changes in the community due to the pipeline; individuals encountering changing values in themselves, or confronting different decisions than they had made before. "As a result of greater employment opportunities for women and teenagers, as well as new jobs and career advancement for men, people established new roles and new identities in the community and in their families. At the same time, people were forced to consider conflicting values between jobs and families, affluence and change in lifestyle. The new roles and value conflicts may have contributed to stress within individuals and families. These types of stress may be reflected by greater utilization of counseling services, more marital problems and divorces and increases in runaways and juvenile crime."[43]

Nevertheless, there was a balance that occurred between stress and satisfaction. "One hypothesis that explains the relative neutrality of mental health indicators despite rapid community change during pipeline construction is that at the same time Fairbanksans experienced personal satisfaction as a result of better jobs and/or higher incomes."[44] "This affluence and personal optimism may be reflected by lower rates of public assistance, more marriages, more births, and relatively fewer deaths due to violence in relation to population increases."[45]

"Although most people were able to cope with the higher cost of living and physical changes in the community, there were some who were 'pushed over the brink' by those changes. Most of these were people who had chronic problems of emotional instability. The intensification of their problems as a result of stress in the community may be reflected by increased number of suicide calls to Crisis Line, more severe and complex problems relating to child welfare, and the general relief caseload increase."[46]

B. 1977 - 1978 (Mental Health Services)

With 1978 came the addition of two private psychiatry clinics. "Growth of the private mental health services may be attributed directly to increased health insurance coverage: both more Fairbanksans were covered by job-related health insurance and more health insurance policies provided coverage for mental health. More than any other factor, the change in demand for private mental health services was precipitated by the Teamsters Union pre-paid medical program which provided 100% coverage until January 1978 and was then reduced to 50%."[47]

A. 1978 - 1971 (Alcoholism)

Alcohol abuse is a major mental health problem in Fairbanks. However, because record keeping of alcohol treatment agencies was not complete or did not exist at all it is difficult to quantitatively assess changes in alcohol abuse. Other barriers to accurate measurement are that medical insurance usually does not cover alcohol-related problems so that intoxification was rarely recorded in ambulance logs or hospital admission records; and data on public drunkenness during the pipeline period was not available from the police because of the decriminalization law that went into effect at that time.

Mayor H. A. Boucher announced on February 22, 1969 that, "Fairbanks has a drunkenness rate five times that of other cities its size," and went on to comment that a public treatment center was possibly the only solution to this major local problem.

In a report prepared by the city police it was shown that public intoxification has long been a frustrating problem in the city of Fairbanks. Acute and chronic alcoholic intoxification was singled out as the largest problem related to mental health by community planning groups in Alaska. It is noteworthy that the Mental Health Act of Alaska specifically excludes acute alcoholism from the responsibility of the State Division of Mental Health.[48]

In March 1971 the Fairbanks detoxification center was removed from the proposed state budget. Nevertheless, by December 1971 the Fairbanks city council launched a program to combat alcoholism. The plans included three facilities able to treat up to 150 alcoholics at one time; operation of a detoxification center with a 70 bed capacity; and a program to provide supportive living for about 30 persons and a rehabilitative Halfway House for 25. The plan was subject to approval by the Alaska State Advisory Committee on alcoholism.[49]

Prosecution of drunks was halted December 6, 1971 on a 60 day trial program albeit drunks would be taken into custody for their own protection.

In the years prior to the pipeline (1971 - 1973) liquor distribution did not increase and consumption of wine and beer increased only 20%.[50] The increase in beer consumption between 1971 and 1972 may have been due to lowering of the drinking age and/or the influx of young people seeking summer employment in Fairbanks.[51]

B. 1972 - 1973 (Alcoholism)

In May 1972 the alcoholism program initiated by the city was contracted out to a church group (Community Service and Property Corp. of Fairbanks - COMPAS). Predictions were for the alcohol detoxification center and rehabilitation programs to begin functioning by July 1972. However, by the end of July the detoxification center was not functioning due to difficulties in transforming facilities to meet fire marshall specifications. Operation was expected within a few weeks at which time hopes were for 15 beds in the detoxification ward. Sixty to 70 people were being treated in the rehabilitation program. The city jail was providing initial detoxification services in the interim.

Also in July, George Spartz was named permanent director of the Fairbanks comprehensive alcoholism treatment program by COMPAS. The former acting director, Father William Warren resigned in order to return to his parish. Until Spartz could assume his duties in September or October of 1972, Dean R. Hickox would function as acting director.[52]

Effective October 9, 1972, public drunkenness was no longer treated as an offense in Fairbanks, but as a disease. The announcement was made in September of 1972 and at that time there was no delegation of responsibility for transporting drunks to the still not open detoxification center. COMPAS indicated that it did not have funding for transportation and thought that the police should do the transporting. Police Chief Sundberg questioned COMPAS officials whether, as the October 9 deadline neared, they really wanted to handle the drunks after all.

Also in September of 1972, a former counselor in the comprehensive alcoholism treatment program claimed that the program suffered from mismanagement by the COMPAS group, and called for formation of a "fact finding committee to visit, investigate and ascertain all of the facts and make a determination as to the feasibility of continuing this farce under its present stewardship."[53] Charges were refuted by acting director Hickox and he defended counseling methods used. Hickox announced at the same time the opening of the detoxification center.

On October 6, 1972, the city of Fairbanks terminated its contract with the COMPAS group due to breach of contract in the form of misuse of funds. The city took over full operation of the alcoholic treatment program. In late October the Governor's Advisory Board on Alcoholism recommended the city of Fairbanks resubmit its application for the comprehensive alcoholism treatment program before January 1, 1973. The Board Chairman explained that because the Fairbanks application contained inconsistencies that resulted in misunderstanding, and because of the recent furor and publicity concerning the COMPAS group, the State Alcoholism Office had requested the Board cut funds for the Fairbanks program. Before that action would be carried out, however, the Board wanted more details and back-up information about the Fairbanks alcoholism program.[54]

The alcoholism program faced yet another threat to its existence when an amendment to the federal revenue sharing bill going through congress during that time (Fall 1972) was designed to limit funds to state social services effective October 22, 1972. This meant that the city of Fairbanks would lose a substantial portion of its $873,800 contracted for the alcoholism treatment program. Hopes were that if federal funds were cut when congress adjourned, the state would still continue its contract with the city of Fairbanks for the comprehensive alcoholism program.

C. 1974 - 1976 (Alcoholism)

Indicators for increased alcohol use during the pipeline period included: an increase in the amount of hard liquor distributed between 1974 and 1976 by 99% as well as a 51% increase in white wine and an 88% increase in beer distributed. "This may be attributed to greater affluence, an influx of newcomers with different tastes and consumption patterns or the fact that it was easier to smuggle liquor than beer into pipeline construction camps which prohibited alcoholic beverages initially."[55]

"Other indicators of increased demand for alcohol was the rise in the number of bars and restaurants (by 66% between 1973 and 1976) and increased revenues from these establishments (by 400% between 1973 and 1975)."[56]

"Because there appears to be a direct relationship between alcohol abuse and criminal activities, the rise in crime may be an indicator of a rise in alcohol abuse during the pipeline period."

Another possible indicator of increased alcohol abuse in Fairbanks during pipeline construction was an increased demand for emergency and rehabilitative services for alcoholics. One explanation for this increased demand is that laws against being drunk were abolished. Those who might have been arrested for public drunkenness previously were taken to the hospital or other health related facilities during the pipeline construction period. However, the increased demand for alcoholism services may also have been related to improvements in the local comprehensive alcoholism program and the establishment of a pipeline industrial alcoholism program. ..the object of which is to provide a method of early identification of workers with alcohol problems and give them a non-threatening way to seek assistance."[57]

In 1974, the State of Alaska Office on Alcoholism received a $600,000 federal grant, $200,000 of which went to the Alaska Management and Employee Affairs, Inc. (ALMEA), a non-profit agency designated as administrators of the Alyeska industrial alcoholism program. $57,200 went to the city of Fairbanks. The Fairbanks city council on alcoholism was upset by the larger appropriation given indirectly to Alyeska (through ALMEA). Alyeska Pipeline Service Company refused to fund ALMEA directly for the industrial alcoholism program and company officials defended their position by pointing out that they paid not only tax dollars, but provided alcoholism coverage to their employees within a medical insurance program.

In July 1975 ALMEA opened an office in Fairbanks. "The activity reports of ALMEA indicate that instead of providing direct services to pipeline employees with drinking problems, ALMEA referred these persons to other agencies and programs. Thus, it appears that the effect of ALMEA was to increase demands on other local alcoholism programs."[58]

Following the failure of other agencies contracted by the city, the Fairbanks Native Association (FNA) was engaged by the city to provide a comprehensive alcoholism program (CAP).

However, the FNAwas plagued by four changes in administrators during 1974 and another change in 1976; and thus were plagued by financial concerns.

In 1974 the State Office on Alcoholism cut back its funding for the CAP in Fairbanks. FNA reacted to the cut by closing the detoxification center and emergency shelter in June. During the first six months of 1975, FNA contracted with Careage North (@ $105/day/person) for a five-bed detoxification unit. When the contract expired, the detoxification center operations were not resumed until 1977. Cost effective treatment of detoxification was the major obstacle to program continuation. "Hospital administrator Tom Mingen estimated that 5 - 10 persons were treated for alcoholism at the hospital each day. To keep ten patients per day in the hospital for a whole year cost $774,347, which was more than the total FNA/CAP budget. Instead of a detoxification unit from mid-1975 to 1977, FNA opened a drop in center and a halfway house.

Criticisms of the program effectiveness and the quality of personnel in FNA/CAP reached a crescendo in October 1975. A concerned citizens group was formed as a result. However, together with subsequent improvements made in the CAP program and FNA staff, and with the close involvement of the concerned citizens group, comprehensive treatment and emergency programs had come to fruition by 1976 with added financial help from city, state and federal sources.

"In November 1977, the drop in center was closed and the detoxification center was opened in its place, in a store front on First Avenue. The detoxification center was operated by FNA at a $55 - $65/day/person rate. The emergency service patrol was then discontinued."[59]

"Because of wide-ranging program changes, (in order to provide continuing quality and effective treatment services) it is difficult to isolate how our programs may have been impacted by the pipeline," according to FNA/CAP program director JoAnn Gal.[60]

In December 1977, the Teamsters Union and the Fairbanks Memorial Hospital Foundation negotiated and subsequently signed an agreement on Phase II of hospital expansion in the form of a $20 million rehabilitation center adjacent to the hospital. The center would service alcoholics among other types of patients.

HEALTH SERVICE PROFILE

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Retail Trade in Fairbanks 1968-1978:
A Profile of Changes During the Pipeline Impact Period

Prior to 1960, virtually all of the retail trade and business activity of Fairbanks was centered in the core area of downtown which is bounded by Wickersham Street to the west, Noble Street to the east and the Chena River to the north. The Northern Commercial Company, which occupied the largest single land area in downtown had long been the area's major retailer. The core area business district was divided into an irregular patchwork of tiny lots and characterized by small, often dilapidated buildings. Most businesses were small operations, locally owned and operated, without affiliation with national chains. Since land in this area was owned by numerous parties rather than a few large interests, any large scale developments would require a coordinated effort. An additional impediment to development in the core was financing. Neither local businesses nor local financial institutions had the capital required to finance large scale developments. The state as a whole was "capital poor," and heavily dependent upon Seattle for such resource. However, what limited funds were available, typically went to Anchorage which had a larger population and more diversified economy.

In 1961, the first major retail establishment, Foodland Shopping Circle, was built outside the core area. It was located near the intersection of Cushman and Airport Way -- about <u>seven</u> blocks from the edge of the core area. The center, which contained a large modern supermarket variety store and several small shops, was built by an Anchorage entrepreneur. During the early 1960's a second food store was built outside the core this time north of the Chena River at the corner of the Steese Highway and Third Street in Graehl. A third grocery store was built on Airport Way near Cowles Street.

The first major breakthrough for the downtown business district occurred in the mid-1960's as part of an urban renewal project. The effort was financed by the government and was able to overcome the problem of multiple land ownership by instituting condemnation proceedings. Three major retail establishments in the core area emerged as a result of this project -- the J. C. Penneys, Woolworth, and Safeway.

A major flood occurred in Fairbanks in 1967 and the downtown area was one of the most heavily damaged:

> "To help Fairbanks rebuild after the flood of 1967, emergency legislation was passed to make disaster funds available for urban renewal. However, significant delays occurred in determining eligibility. The Alaska State Housing Authority chose the East Side for urban renewal after receiving a reply from the Federal Housing and Urban Development that only small-scale 'neighborhood development' projects would be federally funded."[1]

Thus, rebuilding and repair after the flood concentrated on small-scale projects and was not a catalyst for a major downtown redevelopment. Despite the suburbanization which had occurred in residential development during the 1960's, the core area remained the dominant retail and center for the community.

Another factor which would later facilitate construction of retail centers outside the core area was that there were sizeable parcels of land within a mile of downtown that were unzoned and hence, areas of "unrestricted use." During 1969 a Fairbanks Daily News-Miner editorial observed that "until recently the Borough has done very little in the way of zoning since 1964. It will be required to do much more as the area grows, and the oil activity on the North Slope brings in more population.[2] However, zoning was unpopular and the Borough had difficulty introducing more restricted zoning. Additionally, through political pressure property could be re-zoned to less restrictive uses to allow for particular developments.

Following the discovery of oil on the North Slope in 1968, Fairbanks experienced an in-migration of job seekers and their families. As Fairbanks set out to woo the oil industry, the local Chamber of Commerce assumed the leadership position in attaining this end. Quotes from Mim Dixon's (1978) study of Fairbanks summarize many of the attributes and attitudes of this economic sector during the early pipeline period:

> The oil industry did consult with Fairbanks business leaders to determine what resources the community wanted to provide and what resources should be provided 'in house' by the oil companies. The Chamber of Commerce was eager for the community to acquire additional businesses and discouraged the oil companies from accepting more responsibility in such areas as housing, office space and procurement of supplies.[3]
>
> Most local businesses have been family organizations established in Fairbanks over a period of years. Many of the business people and community leaders were born and raised in Fairbanks, and their expectations have been shaped by their experiences in the community. While Fairbanks presents opportunities which might attract enterprising young people, it is so far from major business and communication centers that it does not attract sophisticated business persons who are competent at making risk-taking decisions. Furthermore, most Fairbanks business persons were fairly unknowledgeable and unsophisticated about the world of finance outside their community. This meant that they had limited access to financial resources. Unlike the large national businesses which moved into Fairbanks relatively recently, local enterprises could not afford to sustain losses over long periods or to wait patiently for decisions outside of their control. For example, if Sears, Roebuck Co. builds an initially unprofitable store in Fairbanks, it could absorb the losses in its large operation. But if a local clothier decided to build a new store which fails to return a profit for a few years, he could find himself bankrupt and out of business.[4]

Business experiences increased sales and there was a sharp upturn in economic activity. Initially, some of the oil companies housed their families in Fairbanks. It was soon proposed that a pipeline be built to carry the oil from Pruhdoe Bay, through Fairbanks south to the port city of Valdez.

In fall 1969, National Bank of Alaska, the State's largest financial institution, opened a branch in Fairbanks. The branch greatly increased lending opportunities for Fairbanks residents. For example, NBAwas the first to offer FHA and VA financing for home construction. It also financed a new modern subdivision near the University.

In 1970, the grocery store in Graehl expanded to become the Gavora Mall shopping center with a large supermarket, Pay 'n Save store, and out ten small shops. Businesses built up inventories and geared up their operations in anticipation of the pipeline. A number made substantial investments in anticipation of the economic bonanza ahead.

The promise of prosperity, however, proved to be short-lived. The pipeline project was delayed and Fairbanks experience a sever economic decline. In May 1972, the Borough Pla-ning Department released an "Economic Base Study and City Center Development Opportunities" report prepared by a San Francisco consulting firm. The report was part of a larger program designed to prepare a master plan for the redevelopment and revitalization of the core area of Fairbanks. The report noted:

> "Although it is quite obvious that many individuals and businesses in the Fairbanks area are experiencing real and unfortunate economic difficulties, the Borough as a whole is fortunate in one instance in that a breathing spell is provided for in planning the future of the community. This can allow the local citizenry to be prepared when the full impact of the pipeline construction, road construction, refinery development, and other related economic activities take place."[5]

The report acknowledged that the current economic conditions did not warrant additional retail facilities. However, it warned:

> "When the economy turns around and growth continues, there will be an increasing requirement for retail and commercial facilities.

Whether or not such facilities go to the city center area, or whether they go to the suburban area, which would result in a diminishing of the core area's economic strength, is a question that can be decided by the city at this time."[6]

The report termed the downtown core area "quite healthy" in terms of its domination of the market, since there were no major suburban shopping centers with a variety of small specialty stores. The report concluded:

"There is a strong possibility that with concentrated public action, citizen involvement, and investor interest the city center area cannot only maintain its existing strength, but can be expanded and revitalized to accommodate the growth that is expected to occur in the future."[7]

Although the report predicted that the long-run growth potential for Fairbanks was good, it was pointed out that expansion of the retail sector should be done carefully:

"It is especially important that strong policies be established on the part of the community to ensure that, during periods of boom, excessive development of non-residential functions of the type suitable for the downtown area are not allowed to take place on a random, fragmented basis in suburban locations. While such activities can be justified in a rapidly growing metropolitan area on the assumption that any overbuilding is quickly absorbed by accelerated growth, the Fairbanks economy is such that major over-expansion during growth periods can result in long term over-capacity during recessions that can have a depressing effect on the total retail, office, and commercial structure of the economy wherein no one truly benefits. "[8](viii)

In 1972, it was anticipated that pipeline employment would add approximately 11,400 to the workforce at the peak of construction. However, the report predicted that a vast reduction in employment and indirect service would occur after completion:

"There is a grave concern, however, in the retail trade industry in that a slump in sale will occur after the major impetus of pipeline construction has been completed. There is an all too clear danger of overbuilding and over-expansion at the initial phases only to see a sever cutback in sales after completion of the pipeline.">

"There is an extreme danger of a major recession in the Fairbanks area in the event of gross over-expansion of housing, retail facilities, and other services. Typically, there is a lag time in the relationship between direct and indirect employment. When a basic industry enters a major period of expansion, indirect employment such as services, retail trade, finance and insurance, etc, can take several years to catch up in terms of employment. Conversely, when the basic industry enters a sharp reduction of employment, there is this corresponding lag time in reduction of employment in the service or indirect industries. This was clearly observed in Seattle, for example, when Boeing Company initiated massive layoffs that were not duplicated in the retail industry until about two years later."[10]

The City Center Development plan identified the multiplicity of land ownership, obsolete structures, parking problems, and congested traffic access as problems to be addressed. It recommended that the older Second and Third Avenue shops be linked to the larger stores in the urban renewal area via heated walkways. The plan included the approximate locations of retail stores, offices, multi-family high and low density dwellings, parking garages, and a civic and government center for state, federal, and perhaps local offices.

In the Spring of 1972, the urban renewal issue of whether to accept state and federal funds to undertake an East side neighborhood development project was voted down by the Borough, but approved by the City Council. When the Borough reconsidered and later approved the project, East side residents organized a protest headed by Harold Gilliam, who was running for mayor. He vehemently opposed the project as being ill-advised, mishandled and trampling on the rights and security of pioneer citizens. The Alaska State Housing Authority said they chose the East side site for urban renewal to "halt deterioration of a convenient close-in area." Gilliam questioned the validity of the city center concept stating that: "I'm not against development, but, I'm not for growth when it's at the expense of many people and for the benefit of the few."[11] Voters rejected this neighborhood development program in the referendum of October, 1972 and elected Gilliam mayor.

Although the city center plan had been defeated, the Borough continued to use it as aprt of the comprehensive development plan. However, in 1973 the Borough's Pollution Control Commission voiced opposition to the plan citing further consideration of pollution problems in downtown Fairbanks. Later that year, the Borough Planning and Zoning Commission and the Borough Pollution Control Commission tentatively approved a draft, recommending to the city a plan of action for implementing the city center plan, designed to decrease air pollution in Fairbanks. The plan included: 1) closing streets in the core conforming to the intent of the final phase of the city center plan, 2) closing the remaining streets in the central business district on on-street parking, 3) providing headbolt heater outlets in public and private parking lots in the business district, and 4) instituting a transit system.

Pollution had reached such a dangerous level by June 1973 that the Environmental Protection Agency EPA) of the federal government intervened in Fairbanks and issued pollution control proposals intended for implementation by 1975. City officials and residents reacted with astonishment at the sweep and turgidity of the regulations and called for more time to work out present pollution problems. At a public hearing with the EPA a local banker pointed out that the core area, which would be hardest hit by restrictions against downtown traffic, pays sixty percent of the city and borough tax bill. The banker continued, "We're being saddled with a double standard and we are not being given time to work it out." A local businessman commented that if the EPA plan was implemented in its present form, “your operation might be a success but you’re going to kill the patient (the city).” By July, the EPA had endorsed a less severe program. The EPA further eased up on its regulations for the city in November due in large part to the opposition voiced at the public hearings.

In July, 1973 the U.S. Senate passed the pipeline right-of-way bill and Fairbanks officials anticipated “an entire change in the attitude of the people. At the present time they’re despondent, they’re discouraged by the delay.” Businessmen were optimistic concerning the Senate’s passage of the bill. “Prices,” Mayor Carlson commented, “depend on the supplies and the approach taken by the merchants. There is always the incentive to increase the prices. But merchants can control this by getting additional supplies rather than raising prices on the stock they have. The impact should be that the people who have been holding back on construction and investing will have the necessary encouragement to go ahead with their plans."[12]

Ellerbe Engineering and Architectural Company began a feasibility study for a proposed multi-million dollar shopping mall for downtown Fairbanks to include two major stores, a parking garage and possibly a hotel on the city block then occupied by Northern Commercial Co. Building projects under construction at the end of 1973 included the Polaris Building expansion, a new Pizza Hut, a commercial printing addition to the Daily News-Miner building and work on the Chena View Hotel. A six thousand square feet showroom opened at Jim Thompson Ford.

1974-76

When pipeline construction began in April 1974 it created an immediate and unprecedented surge in Fairbanks economic activity. It was estimated that the project provided a direct inputof about $400,000 per day into the Fairbanks economy. Businesses in Fairbanks accustomed to operating on a relatively small scale found themselves struggling to keep up with the demand for goods and services. In many cases their inventories were depleted thus creating shortages in some commodities. The situation was exacerbated when shipments to businesses were delayed due to the heavy transportation requirements of the project itself.

Most businesses experienced critical turnovers in personnel, particularly in low-paying positions as their workers became part of the pipeline workforce which offered the potential for monthly incomes often three times higher than they could make in town. The downtown area was crowded, there were lines and long waits for customers at banks, retail stores and the post office.

Another serious problem businesses encountered was poor phone service. In November 1975 Municipal Utilities System announced that no new telephones were available and that a backlog of eight hundred telephone orders had piled up. The downtown area that was hardest hit. “It’s hard,” telephone spokeswomen Virginia McCotter said, “because so many times I hear (from businesses) ‘we’re losing money’ because they don’t have a telephone.” It was suggested to these businesses that they sign up with an answering service, mobile telephone or ask a neighbor to take messages. In denying any further phone orders, no exceptions were made for businesses.

In 1976, almost simultaneously, plans were announced for building three major Shopping Centers. The largest of these was the Bentley Mall which was constructed on part of a 600 acre tract which previously housed a junkyard. The City and Borough were powerless to force the development to occur downtown rather than north of the City because the land was zoned “unrestricted use”. Merchants in the dwntown area were approached by the malls to become tenants. The increased crime in the downtown area was a major factor which influenced some businesses to move to the malls. A number of the businesses opted to retain their downtown locations and open branches in the malls.

In addition to the trend toward malls outside the core area an increasing number of national chains entered the Fairbanks market. In 1974 the Northern Commercial Company was purchased by Nordstrom, Inc. a large Seattle-based retailer which invested a large amount of money to refurbish and expand the Fairbanks store. Other chains to open new outlets in Fairbanks included Pay ‘N Save, Pay ‘N Pak, Quik Stop, Team Electronics, Clown Town, Pier 1, Laments, Zales, Burger King, Pizza Hut and Shakeys. A Fairbanks Daily News-Miner Editorial in 1976 commented that:

> "... it is no coincidence that so many Fairbanks businesses have changed hands in the past two or three years, many of them going to large national firms. The former owners - in many cases a family operation - found it both profitable and a relief to get out from under the massive growth of business in Fairbanks. For many, it was a way to continue the former lifestyle which prompted the decision to sell out."[13]

Mim Dixon provided a description of the results of the unprecended up-turn on the local economy:

> ' Prosperity was probably most apparent as Fairbanksans did their Christmas shopping in 1975. Three days before Christmas, one of the two local department stores reported that it was selling 4 to 5 microwave ovens each hour. It had the best Christmas season in its lengthy history as one of the oldest stores in Fairbanks. The largest drug and hardware store in Fairbanks also reported the busiest season in its history.[14]

Amidst the prosperity come some condemnation. In a memorable farewell address, Borough Planning Director, Don Gilmer who had been unsuccessful in gaining support for the city center redevelopment plan said:

> "I am concerned about the greed that this community is showing and that greed is probably worst in people who have been here the longest. There are prices being charged here now that have no reason to be charged except for the lack of competition."[15]

He used as example the attempt of the business community to block the entrance of more competitive businesses into the community.

Between 1974 and 1976 the number of persons employed in retail trade rose from 2679 to 3779, an increase of 41 percent.

<u>1977-78</u>

The Bentley Mall opened in April 1977, University Center opened in May and Shoppers Forum opened in June. Combined they contained three grocery stores, three large retail outlets and about 50 small specialty stores. Excluding the grocery stores they contained more than 300,000 square feet of new retail space. The city center plan had projected that between 1972 and 1980 only 200,000 new feet of retail space would be needed in the entire community.

The pipeline project was completed and oil flowed in June 1977. There was not an immediate decline in retail expenditure. In fact the economy was termed "surprisingly good" for 1977 which proved to be a record year for new housing construction.

In a 1978 study Dr. John Kruse noted:

> "...consumer expenditures have not declined a great deal on a per capita basis (between 1976 and 1978) and should remain at or near their current levels unless households are basing their purchase plans on anticipated income which does not materialize. The fate of Fairbanks businesses, however, will only in part depend on per capita spending. Some sectors of our economy may have over-expanded to meet peak population demands. Further, net losses in population are not unlikely and this will put added pressure on some businesses. In addition, the loss of Alyeska local expenditures cannot be ignored. Providing businesses are not tied into high fixed costs and can gear down operations, there does appear to be a sound, but much smaller, economic base in Fairbanks."[16]

By late 1978 the economy of Fairbanks was clearly in a slump. Unemployment was at an all time high and the opoulation had declined. A number of businesses both downtown and in the mall had closed.

Additionally it was widely reported that many businesses, particularly those in the malls were barely able to cover the overhead on their operations.

Despite this downturn, Fred Meyer began construction of a huge retail store across from the Bentley Mall which is scheduled to open in mid 1979. Two new chain restaurants also began constructing outlets.

In June 1978 Northwest Alaskan Pipeline Company announced that it would locate its headquarters in Fairbanks. However, the gas pipeline project was not expected to have a significant effect on the local economy until about 1980 or 1981. In addition there was uncertainty surrounding the project due to the potential for delays and changing market conditions.

As a result of the oil pipeline outside business interests dramatically expanded their activities in the area, so much so in fact that the supply of retail space and services far exceeded the demand in the past pipeline economy.

RETAIL TRADE PROFILE

FOOTNOTES

[1] All Alaska Meekly, Sept. 22, 1978, p. 8.

[2] Fairbanks Daily News Miner, Aug. 14, 1971, p. 4.

[3] Dixon, Mire, What Happened to Fairbanks, Westview Press, Boulder Colorado, 1978, p. 294.

[4] Dixon, Mire, op. cit., P. 133.

[5] Larry Smith & Company, Inc., Economic Base Study and City Center Development Opportunities, prepared for the Fairbanks North Star Borough, May 1, 1972, p. i.

[6] Ibid., p. ii.

[7] 1bid., p. vii.

[8] Ibid., p. viii.

'Ibid., p. 20.

[10] Ibid. , p. 21.

[11] All Alaska Weekly, September 22, 1972, p. 8.

[12] All Alaska Weekly, July 20, 1973, p. 1.

[13] Fairbanks Daily News-Miner, January 7, 1976, p. 3.

[14] Dixon, Mire, op. cit., p. 41.

[15] Ibid. , p. 141.

[16] Kruse, Dr. John A., Community Information Center Special Report No. 1 "Fairbanks Petrochemical Study", March 31, 1978, pp. 81,82.

Electrical Power in Fairbanks 1968-1978: A Profile Based on Documentary Sources

ELECTRIC POWER

Introduction

The Fairbanks North Star Borough is served by two electrical utility companies: Fairbanks Municipal Utilities System (MUS) which supplies electricity to the area within the 1963 boundaries of the city of Fairbanks, and Golden Valley Electric Association (GVEA) which provides electricity to the remainder of the borough.[1]

During the pipeline period, MUS was controlled by a Public Utilities Board (PUB), but rate increases, the budget and major contracts had also to be approved by the Fairbanks City Council. GVEA is a consumer-owned cooperative run by a seven-member board of directors who are elected from the districts in which they reside. The MUS electrical utility was established in 1949 when the city purchased the utility from Northern Commercial Company. The MUS generating facilities, located on the Chena River near downtown Fairbanks, use a combination of coal-fired steam turbines, gas turbines and diesel engines. GVEA was incorporated in 1946 to electrify the rural areas surrounding Fairbanks. Regulated by the Alaska Public Utilities Commission (APUC), GVEA receives loan funds from the Rural Electrification Administration (REA) and the National Rural Utilities Cooperative Finance Corporation. GVEA's generating facilities include a coal-fired generating plant in Healy and diesel and gas turbine generators in Fairbanks, Delta and North Pole.[2]

In August of 1968, the Fairbanks Chamber of Commerce recommended swift action by the community to upgrade utilities in order to attract and take advantage of North Slope oil development. The Chamber of Commerce formed an Oil Impact Committee to develop a Comprehensive Master Plan for the development of Fairbanks. As drilling activity on the North Slope continued throughout 1968 and into 1969, there was great excitement in Fairbanks about the prospective development. During 1968 there was a gradual increase in population associated with the oil support and drilling activities. Fairbanks utilities were considered to be inadequate to meet the increased demand associated with the prospect of oil development.

1. Golden Valley Electric Association

1968-1973

In September 1968, GVEA requested a management study to be made by REA because it was experiencing operating deficits. Some of the results of the study were criticisms of too many personnel on the payroll, the continuing loss of profit on the appliance store and recommendations to conduct a complete rate study for the cooperative. Operating deficits were experienced in 1967 and 1968. The 1967 deficit was attributed to flood losses and failure of the newly installed Healy power plant, forcing GVEA to use the more expensive power plant in Fairbanks. Power plant failures were responsible for increased costs. In 1968, GVEA customers purchased five times as much energy as they had in 1959, while the average price of a kilowatt-hour dropped from 6.43 cents in 1959 to 3.96 cents in 1968. In January 1969, the GVEA board of directors, in response to the 1968 REA study findings, fired the utility manager for mismanagement. They then began to study alternative sources of energy for the utility.

One of the alternatives considered by GVEA management was a new plant in the Fairbanks area, designed to utilize residual fuel refined by the future Atlantic Richfield Company (ARCO) refinery in Fairbanks using oil from the trans-Alaska pipeline. GVEA management entered into discussions with ARCO officials regarding the feasibility of obtaining oil from the pipeline. In June 1969, GVEA applied to REA for a $10 million loan to expand services. The loan was to cover two 3,000 kilowatt diesel, units for installation in 1969 and two gas turbines of 18,000 kilowatts each, one for installation in 1970 and one in 1972. GVEA spokesmen stated that these additions would enable GVEA to provide substantial reserve generating capacity for the Fairbanks area.

A proposal to construct an oil refinery and electric power complex near Fairbanks was made public by a company called Earth Resources Company in November 1969. Earth Resoucres Company announced that eight diesel power units, totalling 11,000 kilowatts, were on order and would be on line by 1970.

With the increase in Fairbanks population, demand for GVEA power began to increase. New residential hookups by GVEA were reported to have increased by 600 during 1969, bringing GVEA'S total subscribers to 6,000. Peak requirements were expected to hit 36,000 kilowatts during the winter of 1969.

In November 1969, a GVEA superintendent speculated that within the next three to four years, GVEA'S peak system requirements would soar to between 90 and 100 million watts if the current trend continued. Plans to meet the projected demand included a link up with the proposed petroleum refinery and power generation complex planned for construction within three years and the possibility of a base load plant fed by residuals from ARCO's refinery to be burned in gas turbines. The superintendent was quoted: "We're going to have to make up our minds by the first of February, and go along with it. . . . The initial cost is less than half of the conventional steam system (coal-fired). . . . If residual oil is available in sufficient quantities at the right price, we would look to burning that in gas turbines. . . . I would certainly anticipate that the use of petroleum products would bring lower costs."[3]

In February 1970, the newly formed subsidiary of Earth Resources, Energy Company of Alaska, proposed a $14 million industrial complex, power station and refinery. By July 17, 1970, Energy Company of Alaska received the green light from the Borough Assembly to proceed with plans for a refinery. When Energy Company revealed its plan in November 1970, estimates for completion reached $40 million and the site chosen to construct the facility was North Pole. Construction was scheduled to start on the refinery as soon as the Trans-Alaska Pipeline System construction permit was granted.

Table 1 lists GVEA's generators in chronological order. In 1967, GVEA completed a 25,000 kilowatt coal-fired generating plant adjacent to the mine at Healy. This supplied the bulk of the utility's power needs until November 1976 when a new 70,000 kilowatt oil-fired gas turbine was installed at North Pole near the oil refinery. As GVEA increased its generating capacity during the period from 1970-1976, its reliance on coal decreased.

Despite delays in pipeline construction, GVEA customers increased from 6,000 in 1969 to 7,068 in 1970 (18 percent), to 7,309 in 1971 (3 percent) and to 7,863 (8 percent) in 1972. The increase in demand associated with the rising number of customers, despite increase in generating capacity in 1970 and 1972, provoked a potentially dangerous situation to exist in which the system experienced a peak demand that exceeded its firm capacity. Firm capacity represents the system's ability to provide power if the largest generating unit fails. A system's firm capacity must exceed peak demand to ensure that needs can be met. During 1970, GVEA peak demand exceeded firm capacity. In spite of the deficit, a potential power failure was averted by a pooling agreement whereby GVEA and MUS purchase power from one another in the event of deficit. Emergency power is also available from all major power plants in the Alaskan Interior through an interconnecting system.

TABLE 1

GENERATING CAPACITY
Golden Valley Electric Association
March 1977

No.	Type Generator	Capacity Per Unit	Year Installed	Location	Total Capacity
8	Diesel	3,000 kw	1961, 1964 and 1970	Fairbanks	24,000 kw
1	Coal-fired	25,000 kw	1967	Healy	25,000 kw
2	Gas turbines	20,000 kw	1971, 1972	Fairbanks	40,000 kw
2	Gas turbines	3,500 kw	1975	Fairbanks	7,000 kw
2	Diesel	250 kw	1975	Delta	500 kw
1	Gas turbine	70,000 kw	1976	North Pole	70,000 kw
				TOTAL :	166,000 kw

Source: Golden Valley Electric Association
Taken from Impact Information Center Final Report.

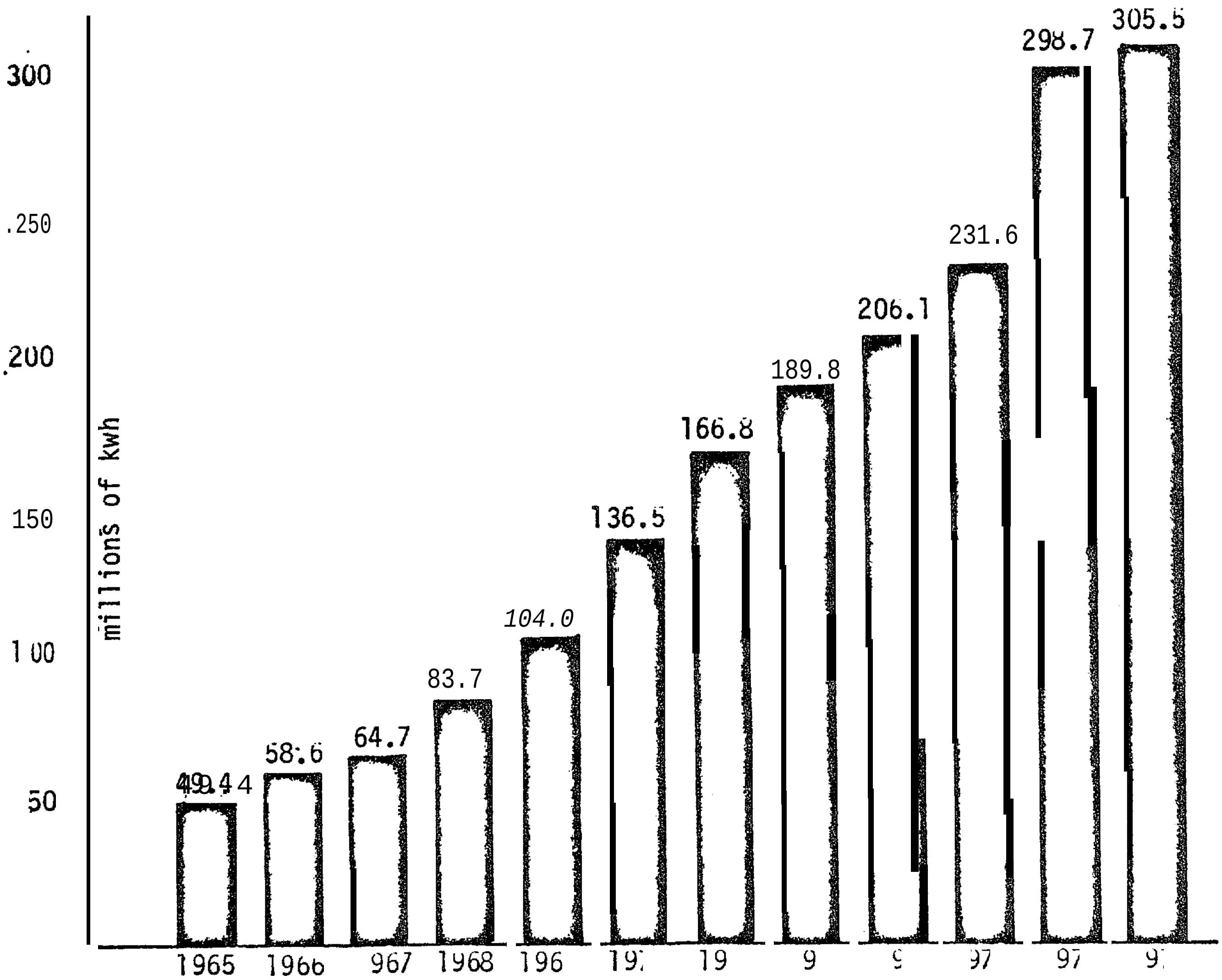
The deficit situation was remedied in late 1970 by the addition of 11,000 kilowatts generating capacity from diesel generators and was further reinforced by the addition of another 20,000 kilowatts in 1971-1972 from gas turbine generators. From the installation of the 20,000 kilowatt gas turbine unit in 1972, until the end of 1973, GVEA's total and firm generating capacity remained constant. The system's peak load remained well within its firm capacity during 1972, although by the end of 1973 firm capacity had diminished to only 8 percent in excess of peak demand. This resulted from sharp increases in demand during the latter part of 1973, as the prospects for construction of the pipeline became firmer. In December 1973, commencement of pipeline construction was authorized. GVEA faced a period of massive increase in demand, unprepared because there had been no further increase in generating capacity in anticipation of pipeline construction.

1974-1978

The period 1974-1976 was characterized by manifest abnormal growth in electrical demand due to pipeline construction activity. An illustration of the escalation in activity is the 32 percent rise in kilowatt-hours sold from 1974 to 1976 (see Figure 1). The relationship of firm capacity to peak demand for the period demonstrates the crisis that persisted from late 1974 to late 1975 (see Figure 2). Despite an additional 7,500 kilowatts provided by the installation of four new generators in mid-1974, peak demand did not begin to fall off until after it had reached a level 13 percent in excess of firm capacity in early 1975. Conditions were ripe for crisis. Further illustration of the devastating onslaught on the utilities by the

FIGURE 1

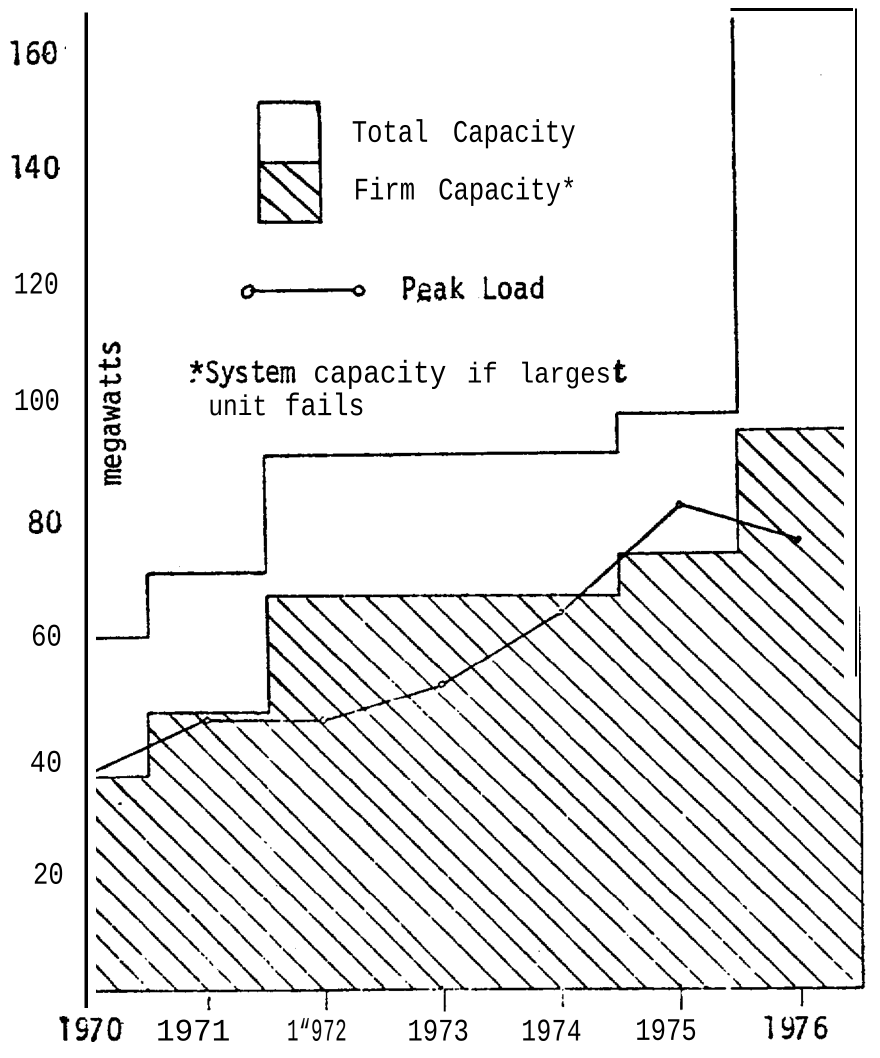
KILOWATT HOURS (KWH) OF ELECTRICITY SOLD
Golden Valley Electric Association
1965 - 1976



Source: Golden Valley Electric Association
Taken from Impact Information Center Final Report

FIGURE 2

GENERATING CAPACITY AND PEAK ELECTRICAL DEMAND
Golden Valley Electric Association
1970 - 1976



Source: Golden Valley Electric Association
Taken from Impact Information Center Final Report

new population that poured into Fairbanks is provided through comparison between the period of unexpected delay in construction (1970-1973) and the period of relentless growth during late 1973-1976.

Although 1970-1973 was plagued with uncertainty because of the delay in issuing the pipeline right-of-way and construction permit, growth was experienced by GVEA in terms of customers and number of kilowatt-hours sold. Residential customers increased by 19 percent and the number of commercial customers grew by 15 percent for a total increase in the number of GVEA customers from 1970 to 1973 of 18 percent. The number of kilowatt-hours consumed rose by 51 percent, representing an annual average increase of 14.6 percent. Average cost per kilowatt hour declined by 5 percent. Total capacity increased by 50 percent and firm capacity by 86 percent.

Between 1973 and 1976, residential electric users increased by a whopping 45 percent and the number of commercial customers increased by an equally stupendous rate of 40 percent. Total customers were up by 44 percent. Total kilowatt-hours sold mounted by 48 percent while the average cost per unit of power escalated from 3.4 cents to 5.3 cents/kwhr (56 percent increase). Total generating capacity grew by86 percent (attributable to 70,000 kilowatts added in 1976) and firm capacity by 39 percent:

From 1974 to 1975, electric consumption jumped dramatically by 29 percent compared to the average annual increase in 1970-1973 of 14.6 percent. The inordinate increase in customers (both residential and commercial) is indicative of the large amount of new construction (directly related to pipeline operations and support) that took place in outlying areas. New housing that was constructed to accommodate the rising population accounted for the spectacular elevation in GVEA residential customers. In April 1975, GVEA announced a moratorium on installation of electric heat. Company officials explained that prior to the pipeline, GVEA received electrical heat applications from only two out of five builders. However, when the pipeline-related housing shortage put pressure on builders to speed up construction schedules, GVEA said nine out of ten builders were applying for electric heat.[4] There were 2,800 new service connections made in 1974-1975 alone.

The rise in large commercial customers needing GVEA'S services was attributable to the creation of Pump Stations 8 and 9, the pipeyard, and the North Star Terminals Complex. Other new GVEA commercial customers whose operations were specific to pipeline support were in areas such as the airport, Van Horn Road and Peger Road.

The stage was set in 1975 for an acute power pinch with peak demand soaring to 13 percent above GVEA'S firm capacity, and only 16 percent under total capacity. Two characteristics of many residential housing units aggravated the situation further beyond the already inflated number of new customers and their power demands.

- New found affluence prompted many customers to buy more energy-hungry type appliances.

- There was an increase in the occupancy rate in single family dwellings due to housing shortages; as a result, consumption per household was greater than normal.

The harsh winter of 1975-1976 also further aggravated the situation, making even the environment a culprit in goading the system to its limits.

Regardless of efforts to persuade customers to conserve electrical energy by using alternative sources of power, insulation, etc., and despite the moratorium imposed in April 1975 on installation of electric heat in new construction, GVEA found it necessary to issue peak load alerts during the winter of 1975-1976. The potential for a major power outage existed under the threat created by excessive peak loads. If the main generator were to malfunction, an inadequate amount of remaining power would unsuccessfully attempt to compensate for high levels of consumption.

During peak load alerts, GVEA appealed to customers to curb their use of appliances, lights and hot water heaters, and to lower thermostats. Some peak load alert measures included the closure of schools and public offices, forced headbolt heater outlet and streetlight shut-offs, and even forced suspension of television broadcasts. The alerts provided the power edge necessary to avoid blackouts or major power outages.

The use of fuel oil for power generation at GVEA succeeded coal as the major fuel source at just the wrong time. Gas and fuel oil shortages were throttling the entire country by 1975. Augmenting GVEA'S power generation headaches was an initial failure to procure fuel from a secondary supplier after the primary one (Tesoro) notified the utility that they could not meet their needs. Tank cars were found to have been tied up on a pipeline-related priority basis. Alyeska Pipeline Service Company agreed, however, to divert their fuel reserves for GVEA during the emergency. The fuel shortage was primarily responsible for the 49 percent escalation in the prices customers were forced to pay for electricity during the pipeline period. The questionable judgment shown on the part of GVEA management in relying on oil-fired gas generators was based on the inaccuracy of future oil price estimates for oil from the North Pole Refinery, and is reflected as a constant reminder in sustained high rates for customers to the present (1977). However, by the time the gravity of the situation became clear with the 1973 Arab oil embargo, GVEA had already locked themselves into financing arrangements for oil-fired generators fired by fuel oil vs. coal--especially significant in terms of sudden pipeline-related demand--helped to overrule a decision to stick with coal.

By 1976, 70 percent of GVEA power generation was oil-fired. Other power producers around the Fairbanks area considered oil too prohibitive in price for power generation use in any but emergency situations. "Other power producers in the part of Alaska. . . are watching with mounting disbelief as GVEA puts all its electric eggs in an oil-fired basket."[5]

GVEA had applied to the Alaska Public Utilities Commission in 1974 for a 25 percent rate increase to cover fuel costs that had increased to a rate in 1974 double that of 1972. The increased number of customers did not provide the revenue necessary to offset the cost of producing energy. During the time APUC deliberated the case, they authorized GVEA to add a surcharge on each customer's bill. This surcharge was designed to recoup the difference between the base cost of fuel in 1972 and current fuel costs. Much to the customer's disgruntlement and disbelief, surcharges took total bills to an astronomically high level. A reaction by such a customer was documented by the Fairbanks Daily News-Miner on January 28, 1976: "We have a small, two-bedroom house, totally electric. Last month our total electric bill, including the surcharge was $99.00. This month, our bill is $292.03. The surcharge is $110.45! This brings our electricity bill to almost double our house payment!" Fuel accounted for 70.3 percent of GVEA total expenditures in 1976 vs. 46.5 percent in 1973 when coal-fired turbines made up a larger portion of power generation fuel types. In 1976, the APUC finally granted GVEA a rate increase but the delay in reaching a determination, coupled with increased fuel expense, brought the rate of increase requested from 25 percent to 48.5 percent. GVEA customers were not paying 5.3 cents per kilowatt-hour in 1976 compared to 3.5 cents in 1974--a 52 percent increase in two years.

With the winter of 1976 came relief in several forms for the management of GVEA and its customers. The winter of 1976-1977 was a comparatively mild one and pipeline activity slowed. In November 1976, a new 70,000 kilowatt oil-fired gas turbine was installed at North Pole. This additional 70,000 kilowatts meant that total capacity swelled by73 percent (from 96,000 kilowatts in 1975 to 166,000 kilowatts in 1976) and that total capacity now was 79 percent in excess of firm capacity (firm capacity, 93,000 kilowatts).

Peak demand levels fell off for the first time since early 1972. Firm capacity remained 24 percent higher than the 1976 peak load (75,000 kilowatt demand) and 12 percent above the record peak demand experienced in 1975 (83,000 kilowatt demand).

MUS and GVEA jointly announced in 1976 plans for construction of a new 150,000 kilowatt coal-fired generating plant at Healy. GVEA would receive 75 percent to MUS's 25 percent of the generator's capacity. However, environmental concerns are expected to delay construction of this project.

Already well along the road to a comfortably high total and firm capacity in 1976, an additional 70,000 kilowatt gas turbine unit was installed at North Pole in 1977. This carried total capacity up by another 40 percent to 232,500 kilowatts, so that total capacity exceeded firm capacity (117,000 kilowatts) by 97 percent and exceeded the 1975 record peak load by 181 percent. Firm capacity in 1977 was 41 percent above the peak demand of 1975. However, with the new 70,000 kilowatt oil-fired gas turbine generator, reliance on oil is increased to 80 percent.

As of 1977, GVEA was hopeful that fuel purchased from the North Pole Refinery, scheduled to begin production in fall 1977, would reduce its fuel costs. The price of oil from the refinery will be determined largely by the price the refinery will pay for oil shipped from Prudhoe Bay via the Alyeska pipeline.

Since 1977, GVEA has built a crude oil pipeline from the Alyeska line to the refinery, guaranteeing a steady oil flow to the North Pole generators. A projected additional $600,000 annually from tariffs earned on this oil would boost revenues significantly. (Projected by GVEA officials in early 1977.)

II. Fairbanks Municipal Utilities System (Electric Department)

MUS was less affected than GVEA by increasing demand during the pipeline period because of more limited expansion capabilities in the areas MUS serves.

1968-1974

During the early part of the pipeline period in Fairbanks, inadequate investment was made in the MUS electric utility. Investment was only made when a crisis situation developed. Long-term planning was impossible because of the uncertainty about oil development and pipeline construction. Community leaders did not find it inappropriate to act from crisis to crisis, many in leadership positions felt this to be the most responsible approach in the uncertain situation.[6]

In January 1970, a proposal to include a capital improvements bond issue on the March 1970 ballot was considered by the Fairbanks City Council. Under consideration was an $11 million revenue bond for long-term capital improvements to electric, telephone, steam heating and water systems. This included the addition of Chena 6, a new power plant, the construction of which was dependent upon future decisions by oil companies with regard to the oil pipeline. Jim Movius, the MUS manager at the time, described the situation as a very uncertain one but he stressed that MUS's growth rate in coming years would be very great. He went on to comment that authorization of the bonds would allow MUS to plan for the future with greater confidence and flexibility. An ordinance to place the utility bond proposition on the March ballot was defeated on January 5, 1970. The City Council decided to delay including the utility bond issue on the ballot until later to avoid confusing the voters who would be considering another bond issue on March 3. However, at least one victory was granted MUS on March 3, 1970. Voters approved an issue on the ballot which would allow for an increase over the current 6 percent interest rate ceiling paid on municipal bonds. The purpose of this issue was to improve the chances for selling further bonds. Although bond approval may be granted by voters, actual selling of bonds can be delayed by the unwillingness of investors to accept low payment of interest and this can hold up service expansion. For example, the power plant that was under construction in 1970 had been authorized by voters in a bond issue in 1962, but had been held up by the slow procedures involved in selling the bonds.

In 1971, the Alaska State Housing Authority published a report on projected needs for public utilities. It offered the following advice:

> In planning to meet these needs the state and local governments should give cognizance to the temporary nature of the pipeline construction and its accompanying increase in employment and community population. In this situation, communities should look for flexible methods of meeting temporary public needs to avoid investing in permanent capital improvements which will be underused in the future. . . .[7]

Between 1968 and 1972, the number of residential customers increased at a slow rate while the growth in commercial customers was attributable to office building additions, hotels and motels. Between 1971 and 1972, the number of residential customers increased by only 1 percent and the number of commercial customers by almost 5 percent. The number of kilowatt-hours sold showed a 1 percent decrease from 1971-1972, although demand levels peaked just slightly higher in 1972 over 1971 (see Tables 2 and 3).

The firm capacity deficiency situation that existed between 1968 and 1970 fluctuated from 7 percent to 28 percent below peak demand levels experienced (Figure 3). This potentially dangerous state of affairs was alleviated in 1970 by the addition of a 20,000 kilowatt steam turbine which enabled firm capacity to remain above all peak demand levels until 1974.

The pipeline delay during the period 1972-73 caused a lull in the growth of Fairbanks. Residential electrical utility customers dropped in number by 2 percent while commercial customers showed a 3 percent gain between 1972 and 1973. The number of kilowatt-hours sold mounted by 6 percent. By the end of June 1972, MUS officials were announcing that "if all goes according to schedule, electricity rates will be raised 25-35 percent." The Fairbanks Public Utilities Board (PUB) recommended the rate increase to the City Council. This increase was the first since MUS purchased the utility company over 20 years before. Jim Movius, the utility manager, announced, "We are now in a deficit position. If the proposed rates had been in effect last year, they would have yielded a net revenue. Over the past few years, MUS has been subject to great increases in labor, fuel and debt services

TABLE 2

ELECTRICAL CUSTOMERS
Fairbanks Municipal Utilities System
1971 - 1976

Year	Residential	Commercial	Other	Total
1971	4,493	846	171	5,510
1972	4,540	884	181	5,605
1973	4,443	910	177	5,530
1974	4,618	941	171	5,730
1975	4,634	968	167	5,769
1976	4,687	978	166	5,831

Source: Fairbanks Municipal Utilities System
Taken from Impact Information Center Final Report

TABLE 3

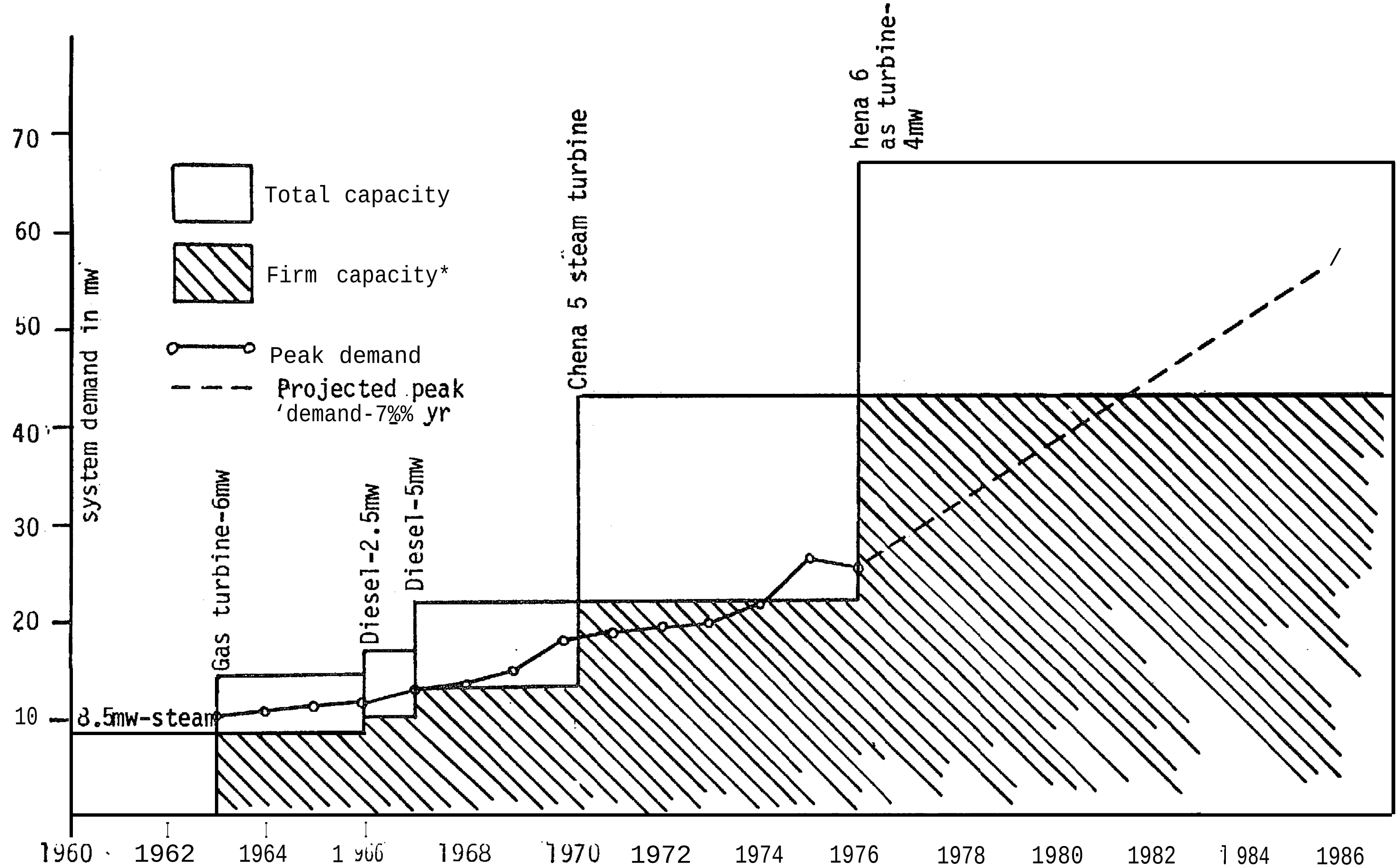
GENERATING CAPACITY
MUS Electrical Department
March 1977

No.	Type of Generator	Installation	Voltage	Capacity
Chena 2	Steam Turbine	1952	4.16 kv	2,000 kw
Chena 3	Steam Turbine	1952	4.16 kv	1,500 kw
Chena 1	Steam Turbine	1954	4.16 kv	5,000 kw
Chena 4	Gas Turbine	1963	12.47 kv	5,350 kw
Diesel 1	Diesel Engine	1967	12.47 kv	2,665 kw
Diesel 2	Diesel Engine	1968	12.47 kv	2,665 kw
Diesel 3	Diesel Engine	1968	12.47 kv	2,665 kw
Chena 5	Steam Turbine	1970	12.47 kv	20,000 kw
Chena 6	Gas Turbine	1976	12.47 kv	23,500 kw

Source: Fairbanks Municipal Utilities System
Taken from Impact Information Center Final Report

FIGURE 3

GENERATING CAPACITY AND PEAK ELECTRICAL DEMAND
Fairbanks Municipal Utilities System
1960 - 1986



*System capacity if largest unit fails

Source: Fairbanks Municipal Utilities System
Taken from Impact Information Center Final Report

for the new MUS plant expansion. . . . I think people understand that because we don't have stockholders collecting profits off utilities, whatever monies we have go right back into the system. With the new proposed approach, everyone pays the same rate no matter how much electricity they use; quantity users, therefore, no longer receive lower rates. Since the demand for electricity nearly exceeds supply, there is no need for promotion rates."[8] The new rate was to be 5.5 cents per kilowatt-hour for all customers regardless of quantity used.

In June 1972, a $6 million bond issue for electric projects including a generating and transmission plant was passed by voters. Revenue bonds do not oblige the property owners in the community and do not permit taxes to be levied to pay for them. It is required that the bonds be paid out of the revenues collected from use of the project funded. As a result, there was no strong opposition to the revenue bond.

Less than two months after the passage of the $6 million revenue bond, the mayor announced that the MUS bonding was in jeopardy, because the city had broken covenants in its bond and bond ordinances by failing to maintain required reserves. By 1973, MUS was bankrupt and could not sell any bonds because of poor credit ratings. Again in 1973, MUS consultants recognized the necessity for a 24 percent increase in electric rates but were consistently turned down by City Council.

The period 1972-1973 marked the end of gradual increases in consumption with demand levels peaking 10 percent higher in 1973 over 1972 peak load. As no new generating plants or generating units were installed from mid 1970 to 1976, firm capacity remained constant. As a result, the steady upswing in electric consumption cut the margin of firm capacity held over peak demand levels during 1972 and 1973 from 11 percent to 1 percent. This set MUS up for another peak demand crisis to occur during the high level of pipeline construction activity in 1974-1976.

1974-1976

By July 1974, city officials were authorized to sell revenue bonds approved by voters in 1972, but they believed further bonding would be intolerable. Lack of financial resources crippled bond capacity and prevented badly needed expansion in 1974. Between 1974 and 1976 the number of residential customers rose by less than 2 percent while the number of commercial customers increased by 4 percent. However, the number of kilowatt-hours sold surged by 21 percent. Demand levels peaked above firm capacity during the entire 1974-1976 period. The change in actual number of customers is not significant enough to explain the growth experienced by the MUS system relative to demand. Because the number of residential customers remained relatively constant and electric consumption increased (between 1971 and 1975, consumption increased per residence by 30 percent while the number of residential customers remained constant) it has been assumed that the "doubling up" phenomenon that occurred during a time of severe housing shortages was partially responsible. Many single family homes turned into dormitories or even boarding houses to cash in on the number of pipeline workers or pipeline work seekers looking for a place to stay. Another reason for increased consumption was that the same customers were experiencing a new found affluence enabling them to purchase more and varied types of appliances. Consumption between 1974 and 1975 reached record heights as the number of kilowatt-hours sold increased by 20 percent. Demand peaked at 19 percent over firm capacity in 1975 (Figure 3). MUS dependence on fuel oil was less than that of GVEA. Fuel oil made up only 13 percent of the total energy sources in use at MUS. The fuel shortage, however, affected MUS as well.

MUS's main generator (Chena 5) broke down several times during the winter of 1975-1976. Many union employees at MUS's power plant had come to Alaska eager for pipeline jobs but needed to put in some time elsewhere before they could meet pipeline job eligibility residency requirements. This led to high turnover at MUS. Because of high turnover, (forty-eight hires and fires for the same thirty-four positions in 1975) theMUS power plant fell victim to the less experienced hands of transients. Equipment broke down and required frequent maintenance as a result.

The borough mayor told a public gathering in April 1975, "Because of lack of commitment by the oil industry, it was difficult for people here to justify spending money, either their own or the public's, in preparation for the boom that might never come."[9]

Political and procedural delays were ultimately responsible for precipitating the critical power situation in 1975. A 24 percent rate increase was recognized as necessary by the MUS consultants as early as 1973. A Fairbanks Daily News-Miner editorial of May 25, 1976 attributed the

"..... second guessing," and stalling by council to have ". . . significantly delayed MUS's preparation for the pipeline boom." An 8.21 percent rate increase was requested by the Public Utilities Board in October 1975. Not only did the City Council delay their decision for four months, but when approval finally came to pass, they had whittled the rate down to only 4 percent.

Once over the hump in 1975, with the help of a mild winter and slowed economic growth, peak demand levels began to fall off in 1976. The number of residential customers increased by only 1 percent; the number of new commercial customers rose by only 1 percent; and the amount of kilowatt-hours sold rose by less than 1 percent between 1975 and 1976. MUS overhauled its taxed main generator at a cost of $0.5 million over the summer of 1976. By December 1976, a new 23,500 kw gas turbine generator (Chena 6--the generator proposed for inclusion on a 1970 bond ballot but denied for ballot inclusion by City Council.) was installed and in use, bringing MUS dependence on fuel oil to 44 percent of the total power generation units. Following installation of Chena 6, firm capacity rose to 59 percent in excess of the record peak load levels experienced in 1975-1976 which would be adequate to serve predicted demand until approximately 1981. Total generating capacity increased by 56 percent between 1975 and 1976 (41,845 kw in 1975 vs. 63,345 kw in 1976).

Frustrated with a city council that refused to grant the total rate increase requested in October 1975 and whose record of response was marked by a four month delay even while a potential power crisis loomed, the MUS controller handed in his resignation in June 1976. The controller cited several occasions on which the city council ignored PUB recommendations. He was quoted by the Fairbanks Daily News-Miner on June 22, 1976, "Ifwe continue on the way we are, the electric department is going to lose $1 to $2 million, not to mention the money needed for power plant maintenance."

A July 1976 19 percent rate increase request was approved in September 1976 by the City Council. The rate was successfully defended by the PUB with data to prove the controller's dire prediction of revenue loss, as well as documentation of the financial losses experienced for the past several months by MUS. The 19 percent increase included the 4 percent that the City Council had failed to approve in February 1976, as well as 6 percent to cover the new generator expenditure and 9 percent for increased fuel and labor costs.

Hindsight appeared to be the only impetus for action on the part of the City Council during the impact period. Rather than take early action to ensure accommodation of probable increase demand, MUS expansion only took place after the system had nearly strangled on its own inability to provide reliable service.

Conclusions

Under normal circumstances, expansion of utilities in Fairbanks is hampered by the short construction season and by the prohibitive cost of the long supply lines needed for a population that is scattered due to many areas characterized by permafrost or swamp. During the pipeline period, the responsiveness of both power utilities serving the Fairbanks area was poor. The utilities coped with increased demand, only barely avoiding breakdowns and outages, rather than planning in advance to meet the demand. Neither of the power companies were adequately prepared to meet the soaring demand that accompanied pipeline construction. The need for planning and expansion was recognized as early as 1969 but plans were not carried out. The community was unwilling to make major investments in utility expansion in the absence of assurances regarding the sustained growth of Fairbanks, both during and after the pipeline construction. The community was unable to generate accurate and credible predictions of demand during pipeline construction and had no means of assessing Fairbanks' long-term economic prospects.

Both capital investment and rate increases were held up by cumbersome procedural requirements. Decision-makers responded after-the-fact, not in advance. There is no better illustration of this than the MUS 19 percent rate increase in 1976 that came two years too late. Lack of adequate advance planning also led to unnecessary dependence upon expensive fuel oil: fuel oil generators could be brought on-line more quickly to meet the rising demand than could coal-fired generators.

The response of the electric power utilities in Fairbanks during the pipeline period was far from satsifactory, consisting of reaction to increased demand and coping with crises, rather than planned, rational expansion to accommodate predicted increased demands.

TABLE 1

GENERATING CAPACITY
Golden Valley Electric Association
March 1977

No.	Type Generator	Capacity Per Unit	Year Installed	Location	Total Capacity
8	Diesel	3,000 kw	1961,1964 and 1970	Fairbanks	24,000 kw
1	Coal-fired	25,000 kw	1967	Healy	25,000 kw
2	Gas turbines	20,000 kw	1971,1972	Fairbanks	40,000 kw
2	Gas turbines	3,500 kw	1975	Fairbanks	7,000 kw
2	Diesel	250 kw	1975	Delta	500 kw
1	Gas turbine	70,000 kw	1976	North Pole	70,000 kw
				TOTAL :	166,000 kw

Source: Golden Valley Electric Association
Taken from Impact Information Center Final Report.

ELECTRICAL POWER PROFILE

FOOTNOTES

[1] Susan R. Fison and Cindy L. Quisenberry, Impact Information Center Final Report, Chapter XIII, Public Utilities, Fairbanks North Star Borough, 1977, pp. xiii-i.

[2] Ibid., pp. xiii-8.

[3] Fairbanks Daily New-Miner, November 11, 1969, p. PA1.

[4] Fison and Quisenberry, op. cit., pp. xiii-15.

[5] All Alaska Weekly, March 5, 1976.

[6] Mim Dixon, What Happened to Fairbanks, Westview Press, 1978, p.138.

[7] Quoted in Dixon, op. cit., pp. 134-135.

[8] All Alaska Weekly, June30, 1972, p. 1.

[9] Dixon, op. cit., p. 135.

Telephone Service in Fairbanks 1968-1978: A Profile Based on Documentary Sources

The Fairbanks Municipal Utilities System (Telephone Department) provides telephone service to all areas of the city and borough of Fairbanks except for Chena Hot Springs Road and North Pole which are served by Glacier State Telephone Company. Long distance toll service is through RCA Alaska Communications.

1968-1971

As a result of the failure of the voters in 1965 to pass a $1.2 million bond for telephone service expansion and development, the MUS telephone system entered the pipeline period in poor shape. Failure of that bond had meant that the system had failed to keep up with growth and technology. Again in 1968, the voters of Fairbanks rejected a bond issue proposal for $3 million for telephone service upgrading. A Fairbanks Daily News-Miner editorial on October 5, 1968 noted the volume of complaints about the telephone system. " The defeated bond issue would have supplied desperately needed equipment. In 1968, 500 people were waiting for telephones.

On October 11, 1968, the Utilities Board called for a $3 million resolution to upgrade the telephone system in response to expansion needs and existing demand in accordance with a five year plan. A Fairbanks Daily News-Miner editorial exhorted the public to pass the bond if the community was concerned about attracting oil companies to the area. The bond issue passed in

January 1969. In May of 1969, the Utilities Board approved the purchase of land for a new telephone service center. Land was again purchased for telephone expansion in July 1969.

Information from the Fairbanks Community Survey (obtained in 1976)[1] showed that 32 percent of the residents sampled considered that telephone service prior to the pipeline development had been poor or the worst Fairbanks' service. Forty-seven percent of the residents considered telephone service to have been fair or mixed and only 21 percent were of the opinion that the service was good.

In January 1970, a proposal to include an $11 million long-term capital improvements bond ($7 million of which was to go toward telephone improvements) in the spring ballot was defeated by the City Council.

Between 1970 and 1971, the number of main telephone stations rose from 9,718 to 10,086, an increase of 4 percent. The average monthly number of installation orders worked rose from 279 to 291 (4 percent) while there was a drop of 29 percent in the number of installation orders that had to be held due to lack of facilities and/or equipment. There was a 4 percent decline in average monthly trouble reports that year (601 to 578) but the number of trouble reports proliferated from 1971 on.

1972-1973

In June of 1972, a $5.5 million bond for telephone improvements was passed

TABLE 1

TELEPHONE STATISTICS
Fairbanks Municipal Utilities System
1970-1976

	1970	1971	1972	1973	1974	1975	1976	% Change 1973-1976
Telephones								
Main Telephone Stations:								
Business	3,053	3,202	3,310	3,635	4,502	5,208	5,517	52%
Residence	6,536	6,764	7,030	7,033	7,513	8,643	8,896	27Z
Coin	119	120	118	128	138	111	156	22%
Sub-Total	9,718	10,086	10,458	10,796	12,149	13,962	14,569	35%
Extension Telephones:								
Business	9,175	9,411	10,033	10,245	10,929	12,185	12,650	24%
Residence	3,152	3,308	3,465	3,631	3,887	4,100	4,359	20%
Sub-Total	12,327	12,719	13,498	13,876	14,816	16,285	17,009	23%
Total Telephones	22,045	22,805	23,956	24,672	26,965	30,247	31,578	28%
Exchanges								
Globe (452 and 456 numbers)	7,467	7,594	7,840	7,S52	8,932	10,140	10,634	35%
Greenwood (479 numbers)	2,251	2,492	2,618	2,944	3,217	3,822	3,935	50%
Trouble Reports (average monthly)	601	578	688	1,173	1,186	1,882.	2,399	105Z
Installations (average monthly)								
Orders Worked	279	291	286	220	318	352	296	35%
Orders Held - no facilities and/or equipment	212	150	134	162	259	265	459	183%
Toll Calls								
Annual Total (in 1,000's)		562	664	710	1,198	1,779		
Per Telephone (main station)		56	63	66	99	127		
Total Revenues								
Amount (in 1,000's)	$	"$2,521	$2,949	$3,363	$4,332	$7,082	$8,095	141%
Per Telephone (main station)		$ 25o	$ 282	$ 312	$ 357	$ 507	$ 556	78%

Source: Fairbanks Municipal Utilities System
Taken from Impact Information Center Final Report

by the voters. The bond was intended to pay for a downtown central office, switching equipment, a portable central office, cable plant, addition to the telephone service center and direct distance dialing identification equipment. Since repayment of revenue bonds comes through the collection of utility payments (it is required that these bonds be repaid out of revenues collected from the use of the projects) there was no great objection to passage of the proposal. However, by August 11, 1972, the city mayor announced that MUS had failed to maintain the required reserves as stipulated by bond ordinances and as a result, the future of MUS bond selling was in jeopardy. It was also made public that the operation and maintenance fund (intended to be twice the next year's operation and maintenance expense--about $.750,000) balance was zero. The telephone utility was in a disastrous financial situation. The mayor underscored the need for substantial rate increases and identified the situation as a major crisis.

On June 27, the PUB recommended utility rate increases to the City Council. The proposed increase would take the monthly charge on one-party residential phones up 35 percent (from $9 to $12).

By 1973, the telephone department of MUS was bankrupt and was unable to sell bonds for improvement because of its depleted reserves position. Rates were raised by 15 percent resulting in solvency for the telephone deparment and making it the only profit making department in MUS.

Between 1972 and 1973, main telephone stations increased by 3 percent (from 10,458 to 10,796). Average monthly installation orders worked dropped by

23 percent (from 286 to 220) while the number of orders held because of lack of facilities and/or equipment swelled by 21 percent (from 134 to 162). Trouble reports on existing service swamped the utility, mounting by 71 percent for the period. Total revenue grew by 14 percent.

1974-1976

"MUS and the Chamber of Commerce officials have identified what may be labeled the Fairbanks area's 'Impact Crisis No. One' and are moving swiftly to attempt to respond affirmatively to it. While most Fairbanksans are painfully aware of the prevailing telephone service deficiencies, few outside of the MUS system itself fully grasp the serious and critical management problems that are at the root of them, most particularly the lack of ready capital needed to expand and upgrade system facilities to meet pressing, current, as well as projected needs in the impending boom years. Although MUS spokesmen have consistently warned of an imminent phone system crisis, it was brought forcefully to the floor last week by chamber manager, Wally Bear, who urged the chamber board to take immediate steps to aid MUS meeting the crisis."[2]

In June 1972, voters had approved a $5.5 million bond proposal for upgrading service. Although in July of 1974, the city manager was authorized to issue the bonds, community leaders and MUS believed that further bonding would be intolerable. Officials in Juneau refused to let city officials use the $3 million worth of impact funds awarded to Fairbanks for upgrading telephone service because they considered that the situation was born out of poor planning and that it pre-existed pipeline demand. Again, inadequate financial resources in the form of bonding capacity thwarted efforts to meet needs.

In September 1974 during pipeline construction, 1,000 new phones were added to the Globe exchange and in October 600 additional phone lines were available on the Greenwood exchange. Although twenty expansion projects were started in August 1974, few were completed during the pipeline boom period.

In November 1974, central telephone office equipment was purchased to provide additional trunk lines to serve Alyeska Pipeline Service Co. facilities at Ft. Wainwright. MUS allocated $11,000 and Alyeska paid for the cost of engineering, installation and maintenance of the equipment. Also in 1974, a $3.5 million switching system was ordered to increase capacity for new phones as well as provide better service.

The onset of pipeline construction in 1974 resulted in an accelerated demand that could not be coped with because the required preliminary planning had not been done. A hopeless financial situation that existed prior to the 15 percent increase in rates in 1973 was responsible for the absence of preparation for the boom in terms of facilities, additions and improvements. By June 1975, MUS announced it had "run out of telephone numbers." The new $3.5 million switching equipment was not scheduled to be installed until 1976. Until that time, no new customers could be assumed. The new state office building sat ready to receive its occupants but due to unavailability of office phones, the opening was delayed. From May 1974 to May 1975, depositors on the waiting list for phones increased by 125 percent.

By November 1975, MUS had 800 subscribers on the waiting list and refused to take any additional applications for new phones until July 1976.

While MUS provides telephone service for the entire borough, it is under the political control of the city of Fairbanks. Residents of the rapidly growing outlying areas were powerless to influence investment decisions which would have provided more service to areas outside city limits. At least half of the 1,564 people on the waiting list for telephone service in May 1975 lived in areas where there simply were no facilities to provide service. Even when the new switch was installed in 1976, it did not increase telephone service for outlying suburban areas.

Between 1974 and 1975, main telephone stations increased by 15 percent (from 12,149 to 13,962). Average monthly installation orders worked rose by 11 percent (from 318 to 352) while the average number of orders held rose by 2 percent (259 to 265). Average monthly trouble reports shot up in 1975 to 59 percent over that of 1974 (1186 to 1882). Total revenue continued to grow: between 1974 and 1975 it increased by 63 percent. By August 1975, the telephone department reported that revenues exceeded $4.9 million (the expected figure) by $1 million (20 percent more than expected).

In an interview published in the Fairbanks Daily News-Miner, August 19, 1975, telephone department manager, Earl Land, said that the MUS telephone department planned to serve 42,000 customers by 1980. He said that 28,000 telephones were in use but that the demand had already reached 42,000. As would be expected in this situation, with a glut in would-be telephone subscribers, combined with excessive strain on the existing system, quality plummeted and customers became exasperated. They took to writing letters to the Fairbanks Daily News-Miner to complain. One letter to the editor had a disenchanted customer reporting that he waited twenty-six minutes for a dial tone. Other idiosyncrasies of the throttled system included busy signals before the process of dialing was completed. Many recognized, however, that the telephone service in Fairbanks had always been erratic. So the change was a change in degree rather than in kind.

Long distance direct dialing for single party phones was introduced in May 1975 by RCA. In July 1975, RCA purchased a $100,000 toll train to improve by 70 percent the chances of getting long distance connections.

There was a 4 percent increase in the number of main telephone stations (from 13,962 to 14,569) between 1975 and 1976. This reveals the marked deceleration in the system's ability to fill demand. Perhaps even more indicative of MUS's ineffectiveness was the 16 percent (from 352 to 296) decrease in the number of installation orders worked and the 73 percent leap (from 265 to 459) in the average monthly number of orders held. Trouble reports continued their ceaseless uptrend at a 27 percent rate (from 1,882 to 2,399), however, at a rate only half that experienced between 1974 and 1975. Total revenue gained by 14 percent, a somewhat less dramatic increase than that enjoyed in 1974-75.

The entire period of abnormal growth (1974-1976) is illustrated clearly by telephone statistics for the same period. Main telephone stations increased by20 percent (12,149 to 14,569). However, the average monthly number of installation orders worked fell by 7 percent (318 to 296) and the average monthly number of installation orders held upsurged spectacularly by 77 percent (from 259 to 459). The overburdened system was the brunt of a 102 percent increase in trouble reports (from 1,186 to 2,399 average monthly). One bright spot for the utility was its overall 87 percent growth in revenues between 1974 and 1976.

When the new $3.5 million switch was finally installed in 1976, trouble reports remained high due to what the MUS manager described as "debugging" the new switch and simply because the switch facilitated the very action of calling in a report by customers. Available telephone statistics do not allow for actual determination of increase demand for service, only increased use. The following article from the Fairbanks Daily News-Miner of June 29, 1976 elucidates more clearly the amplitude of the tide waiting when the switching system became operational:

> Incredulous city officials watched the efforts of unclogging the city's telephone system Monday and, for the first time, measured a demand for telephone service that no one had come near predicting. Some 400,000 local calls were attempted Monday, with an 88 percent completion rate. It was the first regular business day since the Municipal Utilities System's new $3.5 million computerized switch was cutover Saturday night.
>
> In comparison, on an average business day the month before, when the system operating on the old, mechanical switch, only 135,000 attempts were. made.
>
> MUS never before had an accurate means of measuring the success rate of telephone calls locally, but all concerned agreed that the 88 percent rate was considerably higher than the previous rate.

> MUS telephone division manager, Earl Land, was shocked at the number of calls going through the system. He likened the cut-over of the new switch to uncorking a champagne bottle that was really a 55 gallon drum. . . . According to Land, the telephone industry estimates 100,000 calls per day as typical for a city the size of Fairbanks. However, the estimate does not take into account activity stimulated by a pipeline economy.

Since 1975, the MUS telephone department has planned several expansions, none of which have been completed, nor does the prospect of their completion seem likely. Although the telephone department realizes a profit, it does not have financing available for capital improvements. The City Council has refused rate increases for other MUS utilities that are not profitable, and is using telephone department revenues to make up the deficits on the other utilities.

Conclusions

The MUS telephone utility entered the pipeline period in poor shape because of earlier denial of bond funding for development. The MUS telephone department was quite incapable of coping with the increased demand associated with pipeline development. Some upgrading of the system was carried out in 1969 but further upgrading in 1972 was prevented by MUS bonding irregularities. In 1973, the MUS telephone department was bankrupt. Only then were telephone rates raised, resulting later in profits.

During pipeline construction, the MUS telephone department was unable to respond to the increased demand because the financial chaos that had prevailed until 1974 had prevented any anticipatory planning or preparation.

Not until June 1976 was new switch gear installed, by which time pipeline activity had begun a downtrend. Of all services, the telephone system failed most miserably to respond to the increased demand of the pipeline period. Response was rendered impossible because of lack of financing to improve an already overburdened system to meet new demands.

TELEPHONE SERVICE PROFILE

FOOTNOTES

[1] John A. Kruse, Research Notes, Institute of Social and Economic Research, University of Alaska, Fairbanks, December 1976.

[2] Impact Information Center, Report No. 1, July 11, 1974, p. 5.

APPENDIX C

COMPARISON OF FAIRBANKS AND VALDEZ SURVEY RESULTS USED IN ANALYSIS OF INDIVIDUAL CHANGE

(percent distributions)

	Fairbanks			Valdez		
	Residents	Immigrants	Total	Residents	Immigrants	Total
PERSONAL CHARACTERISTICS						
Sex of Head of Household						
Female	13	7	10	11	7	9
Male	87	93	90	89	93	91
	100	100	100	100	100	100
Number of Respondents:	240	168	408	214	194	408
Sex of Respondent						
Female	54	52	53	44	45	45
Male	46	48	47	56	55	55
	100	100	100	100	100	100
Number of Respondents:	240	168	408	214	194	408
Marital Status						
Married	73	74	73	77	77	77
Single	27	26	27	23	23	
	100	100	100	100	100	1::
Number of Respondents:	240	168	408	211	194	405
Presence of Children under 18						
None	46	58	51	52	59	56
1	23	13	19	16	14	15
2	15	16	15	16	17	17
3	12	8	10	9	7	7
4 or more	4	5	5	7	3	5
	100	100	100	100	100	100
Number of Respondents:	240	168	408	214	194	408

	Fairbanks			Valdez		
	Residents	Immigrants	Total	Residents	Immigrants	Total
Age of Head						
17-24 years	9	14	11	3	19	13
25-34 years	29	42	35	24	29	27
35-44 years	25	22	24	25	30	28
45--54 years	20	14	17	21	13	16
55-64 years	11	7	9	19	8	12
65 years and over	6	1	4	8	1	4
	100	100	100	100	100	100
Number of Respondents:	239	167	406	211	192	403

	Fairbanks			Valdez		
	Residents	Immigrants	Total	Residents	Immigrants	Total
Occupation of Head Prior to Development						
Professional-technical	23	24	24	16	15	16
Manager-administrator	13	13	13	16	18	17
Sales-clerical	12	8	10	4	4	4
Skilled blue collar	35	40	37	27	31	29
Laborer	6	7	6	8	9	9
Service	11	8	10	23	21	22
Farm, fish	0			6		
	100	10:	10:	100	10:	10:
Number of Respondents:	216	155	371	193	186	379

	Fairbanks			Valdez		
	Residents	Immigrants	Total	Residents	Immigrants	Total
Education of Head						
Less than high school	16	14	15	25	11	18
High school	33	25	30	38	35	37
Some college	25	25	25	16	30	23
College or more	26	36	30	21	24	22 "
	100	100	100	100	100	100
Number of Respondents:	234	164	398	209	191	400

	Fairbanks			Valdez		
	Residents	Immigrants	Total	Residents	Immigrants	Total
Desire for Personal Economic Benefit						
Not at all important	28	12	21	26	21	22
Not very important	19	18	19			
Moderately important	19	22	20	56	49	51
Very, important	23	26	24			
Extremely important	11	22	16	18	30	27
	100	100	100	100	100	100
Number of Respondents:	235	167	402	85	125	210

	Fairbanks			Valdez		
	Residents	Immigrants	Total	Residents	Immigrants	Total
Desire for Small Town Living Environment						
Not at all important	25	41	32	6	2	3
Not very important	15	24	19			
Moderately important	17	19	18	66	67	67
Very important	34	12	25			
Extremely important	9	4	6	28	31	30
	100	100	100	100	100	100
Number of Respondents:	232	167	403	85	125	210
Desire for a Self-Reliant Life Style						
Not at all important	18	23	20	10	21	18
Not very important	24	39	31			
Moderately important	31	23	27	64	52	56
Very important	21	10	17			
Extremely important	6	5	5	26	27	26
	100	100	100	100	100	100
Number of Respondents:	234	167	401	129	90	219
Desire for More Community Growth						
Strongly oppose	17	8	13	38	50	41
Mildly oppose	15	12	14			
No opinion	11	39	23	19	8	16
Mildly favor	34	17	27			
Strongly favor	23	24	23	43	42	43
	100	100	100	100	100	100
Number of Respondents:	237	167	404	208	73	281
Ties to Community						
Few	33	79	52	69	94	74
Many	67	21	48	31	6	26
	100	100	100	100	100	100
Number of Respondents:	240	168	408	213	290	403
Ties to Outside Community						
Few	91	58	78	88	30	52
Many	9	42	22	12	70	48
	100	100	100	100	100	100
Number of Respondents:	240	168	408	213	190	403

	Fairbanks			Valdez		
	Residents	Immigrants	Total	Residents	Immigrants	Total
PERSONAL EXPERIENCES						
Head Work Directly on Energy Project						
Not working and without. intentions of working	64	43	55	84	48	57
Not presently interested in working	16	13	15	0	0	0
Interested in working but not employed on pipeline	6	14	9	0	0	0
Working now on pipeline	14	30	21	16	52	43
	100	100	100	100	100	100
Number of Respondents:	233	166	399	85	132	229
Job Improvement Indirectly Due to Energy Project						
Strongly disagree	7	25	13			
Disagree	12	11	11			
Mixed	20	17	19			
Agree somewhat	14	19	16			
Strongly agree	47	28	41			
	100	100	100			
Number of Respondents:	110	57	167			
Increase in Time Spent Working						
Less	11	10	10			
Same	45	32	40			
More	44	58	50			
	100	100	100			
Number of Respondents:	240	168	408			
Income Change Between 1974 and 1975						
Absolute income decline	6	21	12	5	7	5
No change in income	28	16	23	12	7	11
$1-10,000 income gain	43	20	34	21	20	21
$10,001-20,000 income gain	15	17	16	25	20	24
$20,001-30,000 income gain	4	16	9	8	26	11
over $30,000 income gain	4	10	6	29	20	28
	100	100	100	100	100	100
Number of Respondents:	222	165	387	76	15	’91

	Fairbanks			Valdez		
	Residents	Immigrants	Total	Residents	Immigrants	Total
Decrease in Time Spent with Family						
Yes	39	41	40			
No	61	59	60			
	100	100	100			
Number of Respondents:	240	168	408			
Decrease in Time Spent Visiting						
Yes	29	42	34			
No	71	58	66			
	100	100	100			
Number of Respondents:	240	168	408			
Decrease in Amount of Participation in Formal Organizations						
Yes	18	23	20	17	13	17
No	82	77	80	83	87	83
	100	100	100	100	100	100
Number of Respondents:	240	168	408	86	16	102
Decrease in Time Spent on Outdoor Recreation						
Yes	37	44	40			
No	63	56	60			
	100	100	100			
Number of Respondents:	240	168	408			
Decrease in Time Spent in General Leisure Activities						
Yes				44	57	54
No				56	43	46
				100	100	100
Number of Respondents:				89	129	218

	Fairbanks Residents	Fairbanks Immigrants	Fairbanks Total	Valdez Residents	Valdez Immigrants	Valdez Total
Decrease in Time Spent Hunting and Fishing						
Yes	30	26	29	46	33	44
No	70	74	71	54	67	56
	100	100	100	100	100	100
Number of Respondents:	240	1"68	408	85	15	100
Purchase of Housing or Land						
Yes	25	19	22			
No	75	81	78			
	100	100	100			
Number of Respondents:	240	168	408			
Purchase of Other Costly Items						
More than one	42	33	38			
One	33	29	36			
None	25	28	26			
	100	100	100			
Number of Respondents:	240	168	408			

	Fairbanks			Valdez		
	Residents	Immigrants	Total	Residents	Immigrants	Total
PERSONAL ASSESSMENTS						
(Change in Community Assessments Predevelopment to Peak Development)						
School S						
Much worse	27	10	20			
Somewhat worse	32	22	29	28	20	24
No change/some better	41	68	51	62	41	48
Much better				10	39	28
	100	100	100	100	100	100
Number of Respondents:	207	116	323	78	77	155
Fire Protection						
Much worse	9	10	9			
Somewhat worse	17	18	18	9	48	37
No change/some better	73	68	71	89	52	62
Much better	1	4	2	2	0	1
	100	100	100	100	100	100
Number of Respondents:	217	148	365	88	98	186
Telephone Service						
Much worse	37	31	35			
Somewhat worse	30	31	30	39	2	11
No change/some better	32	36	33	60	93	85
Much better	1	2	2	1	5	4
	100	100	100	100	100	100
Number of Respondents:	229	153	382	88	128	216
Medical Care						
Much worse	10	15	12			
Somewhat worse	23	15	20	8	28	23
No change/some better	66	69	67	62	38	44
Much better	1	1	1	30	34	33
	100	100	100	100	100	100
Number of Respondents:	224	151	375	83	108	191

	Fairbanks Residents	Fairbanks In-migrants	Fairbanks Total	Valdez Residents	Valdez Immigrants	Valdez Total
(Change in Community Assessments Predevelopment to Peak Development}						
Amount of Fish and Game Available						
Much worse	52	31	43			
Somewhat worse	29	30	30	16	41	34
No change	19	38	27	80	58	64
Better	0	1	0	4	1	2
	100	100	100	100	100	100
Number of Respondents:	220	146	366	73	90	163
Outdoor Recreation Opportunities						
Worse	26	10	20			
Somewhat worse	27	35	30	8	1	3
No change/some better	47	54	49	56	59	58
Better	0	1	1	36	40	39
	100	100	100	100	100	1 00
Number of Respondents:	227	153	370	87	121	208
Special Problems Like: Drugs, Drinking, Vandalism						
Much worse	27 "	27	27			
Somewhat worse	20	28	23	29	42	31
No change/some better	52	45	49	48	41	47
Much better	1	0	1	23	17	22
	100	100	100	100	100	100
Number of Respondents:	220	150	370	83	17	100
Crime						
Much worse	44	34	40			
Somewhat worse	25	25	25	85	80	84
No change/some better	30	40	34	3	0	2
Much better	1	1	1	12	20	14
	100	100	100	100	100	100
Number of Respondents:	232	160	392	81	16	97

(Change in Community Assessments Predevelopment to Peak Development)

	Fairbanks Residents	Fairbanks Immigrants	Fairbanks Total	Valdez Residents	Valdez Immigrants	Valdez Total
Amount of Food and Goods Available						
Much worse	13	16	14			
Somewhat worse	23	20	22	25	2	8
No change/some better	62	62	62	60	59	58
Much better	2	2	2	15	39	34
	100	100	100	100	100	100
Number of Respondents:	232	158	390	88	132	220
Police Protection						
Much worse	22	26	23			
Worse	34	28	32	12	16	15
No change/some better	44	46	45	76	52	59
Much better	0	0	0	12	32	26
	100	100	100	100	100	100
Number of Respondents:	227	150	377	85	118	203
Garbage Removal						
Much worse	9	13	11			
Somewhat worse	16	17	16	16	38	31
No change/some better	72	67	70	82	61	67
Much better	3		3	2	1	
	100	10:	100	100	100	10:
Number of Respondents:	204	149	353	87	118	205
Electric Service						
Worse	40	27	35			
Somewhat worse	30	28	29			
No change/some better	30	43	35			
Better	0	2	1			
	100	100	100			
Number of Respondents:	227	156	383			

	Fairbanks			Valdez		
	Residents	Immigrants	Total	Residents	Immigrants	Total
(Change in Community Assessments Predevelopment to Peak Development)						
Sewage Service						
Worse	4	5	5			
Somewhat worse	16	15	15			
No change/some better	76	79	77			
Better	4	1	3			
	100	100	100			
Number of Respondents:	188	142	330			
Amount of Unspoiled Nature						
Worse	49	30	42			
Somewhat worse	31	36	33			
No change/some better	20	33	25			
Much better	0	1	0			
	100	100	100			
Number of Respondents:	230	158	388			
Noise Level in Neighborhood						
Worse	41	31	37			
Somewhat worse	25	31	27			
No change/some better	33	37	35			
Better	1	1	1			
	100	100	100			
Number of Respondents:	234	161	395			
Traffic Congestion						
Worse	81	62	73			
Somewhat worse	13	28	19			
No change/some better	4	9	6			
Better	2	1	2			
	100	100	100			
Number of Respondents:	238	162	400			

	Fairbanks Residents	Fairbanks Immigrants	Fairbanks Total	Valdez Residents	Valdez Immigrants	Valdez Total
(Change in Community Assessments Predevelopment to Peak Development)						
Time Spent in Lines						
Worse	74	63	69			
Somewhat worse	14	23	18			
No change/some better	8	13	10			
Better	4	1	3			
	100	100	100			
Number of Respondents:						
Overall Mood of Community						
Worse	61	47	55			
Somewhat worse	22	25	23			
No change/some better	15	28	21			
Better	2	0	1			
	100	100	100			
Number of Respondents:	226	157	383			
Relations Between Groups						
Worse	26	21	24			
Somewhat worse	32	33	33			
No change/some better	42	45	43			
Better	0	1	0			
	100	100	100			
Number of Respondents:	217	145	362			
Relations with Neighbors						
Worse	20	23	21			
Somewhat worse	19	20	19			
No change	61	56	59			
Better	0	1	1			
	100	100	100			
Number of Respondents:	226	159	385			

	Fairbanks			Valdez		
	Residents	Immigrants	Total	Residents	Immigrants	Total
(Change in Community Assessments Predevelopment to Peak Development)						
Amount of Government Regulation						
Worse	20	14	17			
Somewhat worse	37	24	32			
No change/some better	42	61	50			
Better	1	1	1			
	100	100	100			
Number of Respondents:	217	139	356			
Air Quality						
Worse	38	32	36			
Somewhat worse	36	36	36			
No change/some better	26	32	28			
Better	0	0	0			
	100	100	100			
Number of Respondents:	234	158	392			
Knowing People Around Town						
Worse	57	30	46			
Somewhat worse	13	23	17			
No change	28	43	34			
Better	2	4	3			
	100	100	100			
Number of Respondents:	232	153	385			
Privacy in the Home						
Worse	15	17	16			
Somewhat worse	19	25	21			
No change/some better	65	57	62			
Better	1	1	1			
	100	100	100			
Number of Respondents:	229	160	389			

	Fairbanks			Valdez		
	Residents	Immigrants	'Total	Residents	Immigrants	Total
(Change in Community Assessments Predevelopment to Peak Development) "						
Quality of Local Services Like Car Repair						
Worse	37	29	34			
Somewhat worse	33	33	33	1	11	8
No change/some better	29	37	32	77	76	77
Better	1	1	1	22	13	15
	100	100	100	100	100	100
Number of Respondents:	220	155	375	90	134	224
Quality and Cost of Housing						
Worse	49	30	41			
Somewhat worse	31	36	33			
No change/some better	20	33	25			
Better		1	1			
	100	100	100			
Number of Respondents:	230	158	388			
Communication with Outside						
Worse	20	23	21			
Somewhat worse	17	18	17			
No change/some better	60	53	57			
Better	3	6	5			
	100	100	100			
Number of Respondents:	229	158	387			
Variety of Wildlife in the Area						
Worse	61	40	53			
Somewhat worse	25	32	28			
No change/some better	14	28	19			
	100	100	100			
Number of Respondents:	225	149	374			

	Fairbanks			Valdez		
	Residents	Immigrants	Total	Residents	Immigrants	Total
Assessment of Current Environmental Conditions						
No problems exist				8	5	6
Slight problems				31	36	34
Significant problems				44	41	42
Serious problems				17	18	18
				100	100	100
Number of Respondents:				99	133	221
Overall Community Assessment						
Much worse	40	25	34			
Worse	38	40	39	14	21	19
Some or better	22	34	27	69	56	60
Better	0	1	0	17	23	21
	100	100	100	100	100	100
Number of Respondents:	231	159	390	90	134	224
Personal Satisfaction						
costs	55	34	47	24	24	24
Mixed	28	29	28	32	22	24
Benefits	17	37	25	44	54	52
	100	100	100	100	100	100
Number of Respondents:	239	166	405	88	124	212
Desire for More Community Growth						
Strongly oppose	11	6	9	17	24	21
Mildly oppose	22	17	20	28	26	27
No opinion	34	26	31	0	0	0
Mildly favor	22	35	27	39	37	38
Strongly favor	11	16	13	6	13	14
	100	100	100	100	100	100
Number of Respondents:	240	168	408	90	134	224

	Fairbanks			Valdez		
	Residents	Immigrants	Total	Residents	Immigrants	Total
Plans to Move from Community after Development Construction Completed						
Yes	15	40	25	51	91	75
No	85	60	75	49	9	25
	100	100	100	100	100	100
Number of Respondents:	240	168	408	209	190	399

APPENDIX D

COMPARISON OF SURVEY RESULTS FROM PREDEVELOPMENT RESIDENTS IN FAIRBANKS, VALOEZ AND FIVE KENAI PENINSULA COMMUNITIES ON VARIABLES USED IN ANALYSIS OF INDIVIDUAL CHANGE

(percent distributions)

	Fairbanks	Valdez	Seldovia	Seward	Homer	Port Graham	English Bay
PERSONAL CHARACTERISTICS							
Sex of Head of Household:							
female	13	11	17	16	12	7	
male	87	89	83	84	88	93	100
	100	100	100	100	100	100	100
Number of Respondents:	240	214	52	100	235	12	14
Sex of Respondent							
female	54	44	42	56	51	29	42
male	46	56	58	44	49	71	58
	100	100	100	100	100	100	100
Number of Respondents:	240	214	52	100	235	14	12
Age of Head of Household:							
17-24 years	9	3	6	12	8 1/		17
25-34 years	29	24	37	21	42	14	17
35-44 years	25	25	25	20	16	29	41
45-54 years	20	21	18	25	15	21	17
55-64 years	11	19	2	9	11	7	8
65 and-over		8	12	13	8	29	
	10:	100	100	100	100	100	100
Number of Respondents:	239	211	52	98	233	14	9

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COMPARISON OF SURVEY RESULTS FROM PREDEVELOPMENT RESIDENTS IN FAIRBANKS, VALDEZ AND FIVE KENAI PENINSULA COMMUNITIES ON VARIABLES USED IN ANALYSIS OF INDIVIDUAL CHANGE
(percent distributions)

	Fairbanks	Valdez	Seldovia	Seward	Homer	Port Graham	English Bay
Age of Respondent:							
17-24 years	13	6	10	17	8	7	17
25-34 years	30	25	31	23	42	21	8
35-44 years	24	22	27	19	16	21	50
45-54 years	18	22	18	19	15	15	17
55-64 years	10	18	2	9	11	15	8
65 and over		7	12	13	8	21	0
	10:	100	100	100	100	100	100
Number of Respondents:	240	213	51	98	233	14	9
Education of Head of Household:							
Less than High School	16	25	38	21	14[1/]	79[1/]	100[1/]
High School	33	38	38	39	35	21	0
Some College	25	16	14	25	23	0	0
College plus	26	21	10	15	28	0	0
	100	100	100	100	100	100	100
Number of Respondents:	234	209	50	95	235	14	12
Education of Respondent:							
Less than High School	16	18	32	24	14	79	100
High School	32	33	36	41	35	21	0
Some College	26	24	22	25	23	0	0
College plus	26	25	10	10	28	0	0
	100	100	100	100	100	100	100
Number of Respondents:		240	49	100	235	14	12

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COMPARISON OF SURVEY RESULTS FROM PREDEVELOPMENT RESIDENTS IN FAIRBANKS, VALDEZ AND FIVE KENAI PENINSULA COMMUNITIES ON VARIABLES USED IN ANALYSIS OF INDIVIDUAL CHANGE

(percent distributions)

	Fairbanks	Valdez	Seldovia	Seward	Homer	Port Graham	English Bay
Race of Head of Household:							
Native	6	9	19	9	2[1/]	79[1/]	100[1/]
Non-Native	94	91	81	91	98	21	9
	100	00	100	100	100	100	100
Number of Respondents:	408	151	52	100	235	14	12
Race of Respondent:							
Native	7	9	17	9	2	79	100
Non-Native	93	91	83	91	98	21	0
	100	100	100	100	100	100	100
Number of Respondents:	248	236	52	100	235	14	12
Expected Length of Residency in Community:							
1 year or less	7	3	6	9	2	0	0
1 to 3 years	8	19	4	4	7	0	0
Longer than 3 years	20	29	23	31	30	0	8
Permanent	65	49	67	56	61	100	92
	100	100	100	100	100	100	100
Number of Respondents:	240	209	52	100	234	14	12

APPENDIX D

COMPARISON OF SURVEY RESULTS FROM PREDEVELOPMENT RESIDENTS IN FAIRBANKS, VALDEZ AND FIVE KENAI PENINSULA COMMUNITIES ON VARIABLES USED IN ANALYSIS OF INDIVIDUAL CHANGE
(percent distributions)

	Fairbanks	Valdez	Seldovia	Seward	Homer	port Graham	English Bay
Number of Children in Household Under Age 18:							
none	46	52	48	55	39	36	17
one or more	54	48	52	45	61	63	83
	100	100	100	100	100	100	100
Number of Respondents:	24	214	52	100	235	14	12
Marital Status:							
Married	73	77	60	63	80	93	100
Single	27	23	40	37	20	7	0
	100	100	100	100	100	100	100
Number of Respondents:	240	211	52	100	232	14	12
Occupation of Head of Household:							
Professional-Technical	23	16	8	10	32	0	9
Managerial-Administrative	13	16	8	23	6	0	9
Sales-Clerical	12	4	5	4	3	0	0
Skilled Blue Collar	35	27	11	32	25	8	9
Laborers	6	8	18	7	5	8	18
Service Worker	11	23	11	9	6	8	0
Fishing & Farming		6	39	15		76	55
	10:	1 00	100	100	1;;	100	100
Number of Respondents:	216	193	38	79	185	12	11

APPENDIX D

COMPARISON OF SURVEY RESULTS FROM PREDEVELOPMENT RESIDENTS IN FAIRBANKS, VALDEZ AND FIVE KENAI PENINSULA COMMUNITIES ON VARIABLES USED IN ANALYSIS OF INDIVIDUAL CHANGE

(percent distributions)

	Fairbanks	Valdez	Seldovia	Seward	Homer	Port Graham	English Bay
Occupation of Respondent:							
Professional-Technical	26	24	12	11	35	10	20
Managerial-Administrative	10	10	9	19	8		
Sales - Clerical	23	24	15	11	8	10	
Skilled Blue Collar	15	28	9	16	18		10
Laborer	12	5	6	6	3	10	20
Service Worker	5	8	12	25	12	10	10
Fishing & Farming	9	1	38	11	16	60	40
	100	100	100	100	100	100	100
Number of Respondents:	319	240	34	63	157	10	10
Initial Attitudes to Growth:							
Strongly Oppose	17	38	33	2	21		25
Mildly Oppose	15		23	15	30	8	33
Mixed	11	19	19	28	22	31	25
Mildly Favor	34		8	25	15	23	17
Strongly Favor	23	43	17	30	12	38	
	100	100	100	100	100	100	100
Number of Respondents:	237	208	52	100	235	13	12

APPENDI D

COMPARISON OF SURVEY RESULTS FROM PREDEVELOPMENT RESIDENTS IN FAIRBANKS, VALDEZ AND FIVE KENAI PENINSULA COMMUNITIES ON VARIABLES USED IN ANALYSIS OF INDIVIDUAL CHANGE

(percent distributions)

	Fairbanks	Valdez	Seldovia	Sewar	Homer	Port Graham	English Bay
Small Town Motivation:							
Not at all Important	25	6	18 2/	9 2/	1	0	0
Not very important	15				9	8	8
Moderately Important	17	66	33	27	23	0	0
Very Important	34				52	5	58
Extremely Important	9	28	49	64	15	34	3
	100	100	100	100	100	108 0	104 0
N of Respondents:	232	85	49	88	234	13	12
Personal Economic Gain Motivation:							
Not at all Important	28	26	90	90 2/	40 2/	93	00
Not very Important	19	0	0	0	0	7	0
Moderately Important	19	56	10	9	40	0	0
Very Important	23	0	0	0	0	0	0
Extremely Important	11	1	0	1	20	0	0
	100	108 00	100	100	100	100	00
Number of Respondents:	235	85	52	100	232	14	12

APPENDIX D

COMPARISON OF SURVEY RESULTS FROM PREDEVELOPMENT RESIDENTS IN FAIRBANKS, VALDEZ AND FIVE KENAI PENINSULA COMMUNITIES ON VARIABLES USED IN ANALYSIS OF INDIVIDUAL CHANGE
(percent distributions)

	Fairbanks	Valdez	Seldovia	Seward	Homer	Port Graham	English Bay
Self Reliant Life-Style Motivation:							
Very low	18	10	14[3/]	60[3/]	3	0	0
Low	24	0	44	40	14	7	0
Medium	31	64	17	0	28	29	0
High	21	0	19	0	34	57	42
Very High	6	26	6	0	21	7	58
	100	100	100	00	100	100	100
Number of Respondents:	234	129	52	99	235	14	2
Proportion Meat and Fish Gained from Subsistence:							
None	36		14	60	21	7	0
Less than 25 percent	46		44	40	29	57	0
25 to 49 percent	11		17	0	23	22	33
50 to 74 percent	6		19	0	20	14	33
Over 74 percent	1		6	0	7	0	34
	100		100	00	100	100	100
Number of Respondents:	240		52	99	235	14	12

APPENDIX D

COMPARISON OF SURVEY RESULTS FROM PREDEVELOPMENT RESIDENTS IN FAIRBANKS, VALDEZ AND FIVE KENAI PENINSULA COMMUNITIES ON VARIABLES USED IN ANALYSIS OF INDIVIDUAL CHANGE

(percent distributions]

	Fairbanks	Valdez	Seldovia	Seward	Homer	Port Graham	English Bay
Local Ties to Community:							
Few	9	12	18[4/]	26[4/]	22[4/]		
Some	24	56	24	23	29		
Many	67	32	58	51	49	N/A	N/A
	100	100	100	100	100		
Number of Respondents:	240	213	51	100	235		

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1 Assumptions based on age, education and race of respondent. Separate demographic data was not obtained in the surveys on the head of household where he/she was not the respondent.

2 Measured indirectly through mention of small town qualities or financial matters in response to open ended questions concerning reasons for moving to the community and what is valued most about the community.

3 Derived exclusively from subsistence measure (proportion of fish and meat gained from subsistence).

4 Seldovia, Seward and Homer ties are measured exclusively on the basis of local friendships and are not strictly comparable to those of Valdez and Fairbanks. The Valdez and Fairbanks measures are also not strictly comparable.

APPENDIX E
TECHNICAL DESCRIPTION OF INDIVIDUAL CHANGE ANALYSIS METHOD

We have not attempted to give a technical description of the analysis technique employed in the Individual Change Component in the main body of the report. A brief, non-technical description is given on pages III-8 to 111-20. However, persons wishing to replicate the analysis or to apply the analytical approach elsewhere will need some additional information. The individual change analysis objectives are to:

- predict individual scores on a *series* of dependent variables in Fairbanks and Valdez using more than one independent variable in each prediction. Independent variables are assumed to be causally related to the dependent variables.

- to provide an overall measure of predictive success for each dependent variable in each case study community.

- to determine whether individual independent variables contribute significantly to the overall prediction of dependent variable *scores.*

- to assess whether the direction of observed relationships between each independent and dependent variable is the same in both case study communities.

- to construct a general predictive equation for each dependent variable based on an interpretation of the analysis results.

- to use these general equations to predict the magnitude and distribution of individual changes resulting from major energy developments.

The dependent variables are either interal or ordinal measure; the interval scaled variables are dichotomous. The independent variables also are either interval or ordinal measures. Many independent variables are dummy variables constructed from variables that were initially nominally seal ed.

A general regression model best fits the analysis requirements. However, the specific form of the regression analysis has to be tailored to fit the scaling characteristics of the independent variables. Multiple Classification Analysis (MCA) fits our particular requirements but an MCA program package designed to handle more than five independent variables is *not* currently available on the University of Alaska Honeywell computer.[1] Instead, we used the standard multiple regression program available in Version 6.0 of the SPSS program package. Independent variables were entered and interpreted according to the suggestions made by Sweeney and Ulveling.[2]

The comparison of independent variable effects in Fairbanks and Valdez is based on unstandardized regression coefficients in order to avoid confounding the relative magnitude of the effect and variance of each independent variable in the two samples.[3] The significance of each regression

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[1] For a description of Multiple Classification Analysis, see F.M. Andrews et al., Multiple Classification Analysis: A Report on a Computer Program for Multiple Regression Using Categorical Predictors, Second Edition, (Ann Arbor, Michigan: The University of Michigan, Institute for Social Research, 1973).

[2] Robert E. Sweeney and Edwin F. Ulveling, "A Transformation for Simplifying the Interpretation of Coefficients of Binary Variables in Regression Analysis," The American Statistician 26 (December 1972): 30-32.

[3] This approach is suggested in Norman H. Nie et al., Statistical Package for the Social Sciences, Second Edition (New York: McGraw-Hill, 1975), pp. 394-397,

coefficient is tested by constructing 80 percent confidence intervals based on the standard error measures reported in the SPSS regression results. The traditional 95 percent confidence intervals were not used because small sample sizes placed a severe constraint on the analysis which could only be dealt with by relaxing the criterion applied to tests of statistical significance. The reader will note, however, that the regression coefficients themselves are not reported and only the direction of the relationship is discussed. In cases where the relative importance of one or more independent variables is particularly enlightening we have performed stepwise regressions to give intermediate R* values. The regression coefficients were used in the construction of generalized predictive equations.

The construction of general predictive equations based on the analysis results proved to be difficult for several reasons. First, the results in Fairbanks and Valdez are not entirely consistent in direction, much less in the magnitude of the regression coefficients. In many cases, we are able to discount the inconsistency because it appears to result from measurement problems rather than from underlying causal differences. However, the generalized prediction equation then becomes a mix of two independently derived equations. Second, we are aware of variables which should be included in the general predictive equations that could not be tested. As a result, appropriate regression coefficients could not be empirically calculated although in some cases rough estimates could be derived. In sum, the generalized equations cannot simply be statistically derived; informed judgment is needed as well.

Fortunately, when the objective is to make a prediction, the particular weights (regression coefficients) used in the equation do not make much difference.[4] In other words, our predictive success is primarily a function of the variables which are included and not the weight given to each variable. As long as we are confident of the direction of the relationship between each independent variable included in the equation and the dependent variable, we have some liberty to alter the regression coefficients.

The actual procedure followed in the construction of generalized predictive equations is as follows. The mean coefficient for each variable shown to have a consistent relationship with the dependent variable is used as the regression coefficient in the generalized equation in most cases. In cases where an observed coefficient is obviously affected by measurement problems in one of the communities, the observed coefficient from the other community is used. The constant for the generalized equation is adjusted to meet two goals. The first goal is to achieve the highest percent of correct individual classifications on the dependent variable. That is, the equation is used to predict an individual's membership among two or three dependent variable categories, depending upon the specific equation. The number of correct predictions over the number of possible predictions (the sample size) is calculated in the case study communities. The constant for the equation is adjusted where necessary.

The second goal is to obtain a predicted distribution that closely matches the actual distribution on each dependent variable. The second goal may conflict with the first in cases where a substantial majority of persons are a member of one category of the dependent variable. For example, if only 15 percent of the sample falls in one of two categories on a dependent

[4] Howard Wainer, "Estimating Coefficients in Linear Models: It Don't Make No Nevermind," Psychological Bulletin 83 (1976): 213-217.

variable, then an equation will be 85 percent correct if all individuals were predicted to fall in the larger category. This is clearly unacceptable because nothing can be said about the membership of the other category. In these cases, some of our overall predictive success is sacrificed in order to improve the predicted distribution. This is easily done by adjusting the constant of the equation.

Since the dependent variable in one analysis often becomes an independent variable in a subsequent analysis, some generalized equations include previously predicted personal characteristics rather than simply a series of observed personal characteristics. As a result, these generalized equations are predtively less successful than they would be if they were based entirely on observed personal characteristics. For example, 83 percent of our Fairbanks respondents were correctly classified in terms of direct employment on the energy project. Seventy-four percent were correctly classified in regard to indirect employment, which is partially dependent on the first prediction. Our success in predicting who receives large income increases drops further to 67 percent.

The generalized predictive equations can only be-used if the variable coding instructions given in Chapter Six are followed exactly. Of course, new variables can be added and regression coefficients can be changed on the basis of further research.

APPENDIX F

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