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THE FISCAL IMPACT OF THE KNIK ARM CROSSING: THE MUNICIPALITY OF ANCHORAGE

by

Dona Lehr
Institute of Social and Economic Research

Lee Huskey
University of Alaska - Anchorage

Phil Rowe
Institute of Social and Economic Research

for

Municipality of Anchorage
Community Planning Department

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I. INTRODUCTION

Purpose

A bridge crossing the Knik Arm, north of Anchorage, was first proposed in the 1950s. The purpose of such a crossing would be to provide access to the undeveloped land in the Point MacKenzie area for the future growth of metropolitan Anchorage. In addition, the crossing would reduce the travel time north.

The Alaska legislature authorized funds in 1981 for an economic feasibility study and environmental impact statement of such a project. Through this process, the most feasible corridors for the crossing were selected. These commitments of funds reflect the support for the project in the state. The project would be a significant expenditure for the state. Its estimated capital cost is over one-half billion dollars; maintenance costs are estimated to run over one million dollars a year (State of Alaska, 1984). In decisions of this magnitude, the full costs and benefits must be carefully weighed. This study is an attempt to add to the analysis of the effects of the construction of the Knik Arm Crossing (KAC) [State of Alaska, 1984].

The purpose of this study is to examine the fiscal impact of the Knik Arm Crossing on the Municipality of Anchorage. Any public project generates a series of costs and benefits. One aspect of the analysis of costs and benefits which is sometimes ignored is that

the people who bear the costs and receive the benefits are not always the same people. Because of this, the distribution of costs and benefits as well as the net effect of the project must be considered. This study examines the effect of construction of the KAC on public revenues and costs from the point of view of the Municipality of Anchorage (MOA); it examines the public costs and revenue effects for one group, residents of the Municipality.

Methodology

What is a fiscal impact study? It is not a complete cost-benefit analysis of the project or a complete impact study. It is incomplete because we focus on one group, the residents of the Municipality; and we examine only one part of the effects, the effect on public revenues and expenditures. It is this narrow focus which defines a fiscal impact study. Many other sectors, excluded in a study of purely fiscal effects, will experience changes as the result of a KAC. Groups such as residents of the Matanuska-Susitna (Mat-Su) Borough, individual property and business owners, residents of other areas of the state, and possibly consumers of Alaska resources would be affected. In addition, the crossing would have many nonfiscal effects on Anchorage residents. Construction of the project would affect Anchorage land markets, retail business, construction activities, and many other sectors. This study excludes these other effects and other groups and seeks only to identify and examine direct cost and revenue effects on the Municipality. Our purpose and design are intentionally limited. The fiscal impacts on the MOA

are an important topic; however, it should be clear that these results are far from a comprehensive look at all of the issues associated with a Knik Arm Crossing.

This study presents projections of the fiscal impact of the KAC under a series of alternative assumptions. None of these projections can be taken as a forecast of future public revenues and costs. We are not able to estimate the exact future level of costs or revenues; our projections show what will happen if a series of assumptions about the future come true. This reflects uncertainty about the level of major variables which will determine public costs and revenues as well as what particular crossing and land development pattern might ultimately occur. The approach used here reflects our specific interest in the changes resulting from the Knik Arm Crossing. This study is concerned with marginal changes or impacts at a point in time, as opposed to an overall evaluation of the Municipality's fiscal condition over time. This study is intended to provide a general sense of the direction and magnitude of the fiscal effects of construction of the Knik Arm Crossing on the Municipality.

This paper is one in a series of studies conducted by the Municipality in an attempt to provide information to local and state decision makers. Two other studies were conducted by the Municipal Planning Department. These studies examine the amount of land available for development in Anchorage and the specific effects the

Knik Arm Crossing will have on the Municipality's transportation system. These accompanying studies provide greater detail of certain specific fiscal impacts (transportation) and an examination of some of the implicit assumptions which lie behind the stated purpose of the Knik Arm Crossing (land shortage).

This examination of fiscal impacts examines only a portion of Municipal activities: specifically "tax-supported" Municipal programs, as included in the Municipality's and Anchorage School District's annual budgets. Excluded from our study are the Municipal utilities and enterprise funds which are supported primarily by user fees. This exclusion reflects a philosophy implicit in the passage of Proposition 24--that these activities pay their own way and that changes in expenditures (costs) will be reflected in changes in revenues (fees charged for services).

One final methodological note concerns the time frame of the study. Our projections cover only ten years after the Knik Arm Crossing is built; the study period is from 1990 to 2000. The main reason for this truncation is the uncertainty connected with projecting beyond fifteen years in the future. So many things could be different past the year 2000 that numbers beyond this period are of little value. Our pre-2000 projections will establish a pattern of impact which can be assumed to continue into the future.

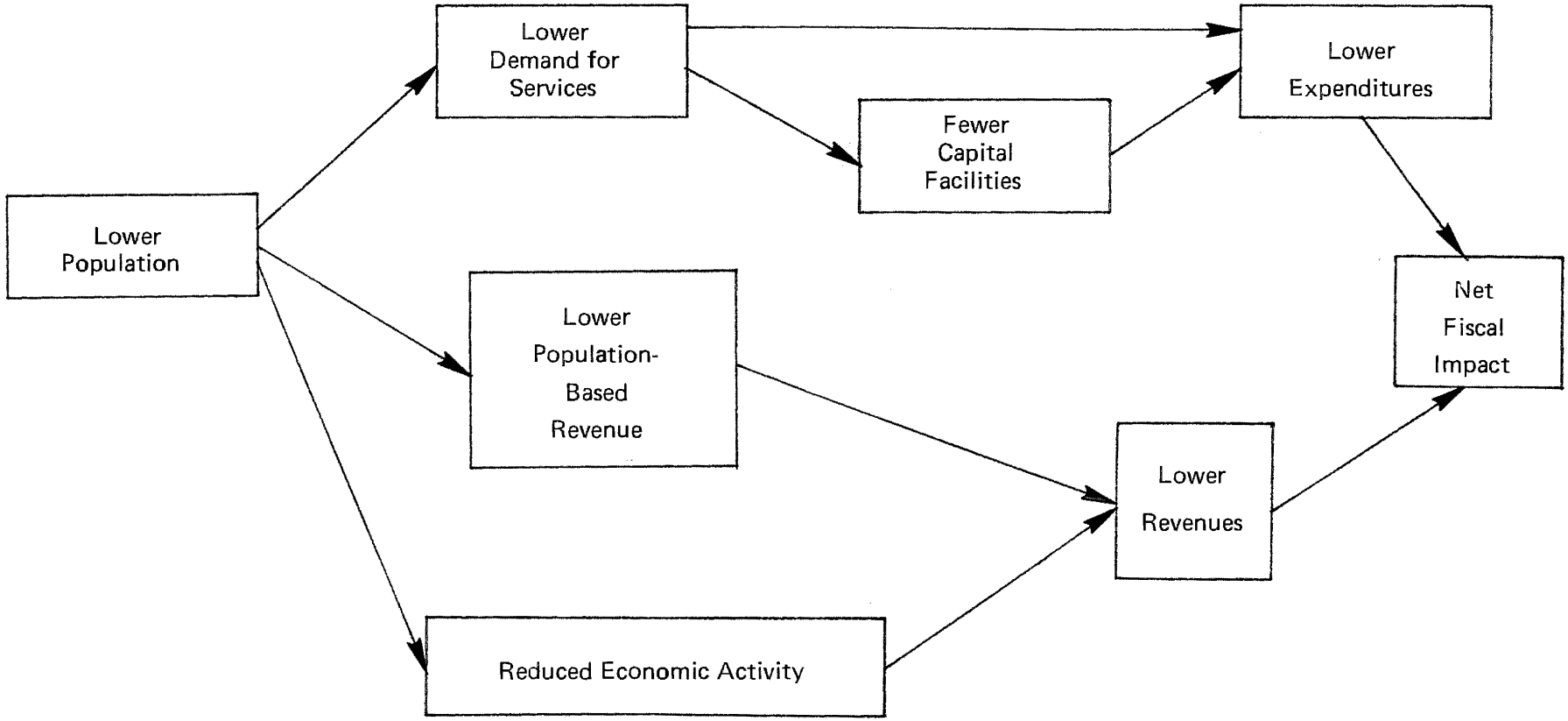
The Basis for the Impact Projections

Construction of a bridge across the Knik Arm will affect the Anchorage fiscal sector in two ways. The first possible effect reflects the opportunity cost of the project. Depending on the chosen financing scheme, use of state and federal funds for construction may take those funds from other uses. The other uses could include other transportation projects or other types of capital projects which alternatively could have been supported by state funds. The extent of the opportunity-cost effect depends upon the extent that private funds are found for the KAC, the future of state revenues, and the future availability of federal highway funds. This opportunity-cost effect is examined in the companion paper for transportation.

This paper examines the second way the Municipal fiscal sector would be affected by the KAC--the direct fiscal effect. The direct fiscal effect is the reduction of expenditures and revenues associated with the different settlement pattern which would result because of the construction of the Knik Arm Crossing. Construction of the KAC would open the undeveloped lands in the Point MacKenzie area to urban development. This area is closer than the current alternative to residential development in Anchorage, the Mat-Su Valley. The improved access to undeveloped land would result in more households choosing to live in the Mat-Su Borough than would do so without the crossing. The reduction of population in the Anchorage Municipality would be the major factor affecting Municipal revenues and expenditures.

Figure 1 shows the three major ways lower population will affect the Municipal budget. First, the cost to provide the same level of service to a lower population will be lower, so the Knik Arm Crossing will reduce the expenditures of the Municipality. This reduction will not be proportional to the reduction in population for a number of reasons. One reason is the existence of economies of scale. Economies of scale are said to exist when the same level of service can be provided to larger populations at lower per capita costs. Where economies of scale are evident, lower population means higher per capita costs for any level of service, and thus the reduction in expenditures will not be in proportion to the reduced level of population. Further, certain Municipal costs are determined by the number of facilities required to provide them, for example, debt service expense and operations and maintenance costs. Since facilities serve a range of population, costs may not be lower if the lower population with the Knik Arm Crossing is still within the range requiring a given number and size of facilities. Finally, residents of the Mat-Su Borough consume services of the Municipality without adding directly to the tax base. Thus, even though more people live in the Mat-Su Borough, the Municipality still provides them with certain services and incurs the costs associated with these services.

Figure 1. The Effects of Lower Municipal Population on the Budget



The other two effects of lower population occur on the revenue side; one is a direct effect and one an indirect effect. The direct effect is on those revenues which are allocated by a population-based formula. Certain state and federal revenues are based on an explicit formula, for example, the School Foundation Program. Other programs are determined in the political process where the relation to population is more implicit. Lower population will result in less of these types of revenues. The indirect effect of lower population occurs because lower population results in fewer autos, trucks, and personal property which the Municipality taxes. The ability to live in the Mat-Su Borough also means fewer homes and businesses and less pressure on Anchorage land markets, which will have the effect of reducing the value of real property and, hence, the revenues from property taxes.

Scenarios

Our projections of the fiscal impact of the Knik Arm Crossing are based on projections of the effect of the crossing on future settlement patterns. We examine the effect of four alternative crossing scenarios and compare these to a base case. The effect of the KAC on Anchorage metropolitan settlement patterns depends on a number of factors; these include the rate of growth of population, changes in the relative accessibility of the Wasilla-Palmer-Eagle River areas, the land availability at Point MacKenzie, and the density of development allowed in the Point MacKenzie area (Goldsmith and Reeder, 1983). The four scenarios examined in this

report reflect differences in the level of development as a result of the Knik Arm Crossing. Table 1 shows the five scenarios (including the base case) examined; these were created in two reports, Goldsmith and Reeder, 1983; KAC Group, 1983. The differences reflect crossing location and development density assumptions.

The examination of four alternative scenarios reflects the uncertainty with which we necessarily view the future. The future settlement patterns can vary for any number of reasons. The future level of the important determinants of settlement patterns are unknown at this time. This is especially important in a case like the Knik Arm Crossing where the changes which could result would be nonmarginal and thus cannot be projected by simply extending the current settlement patterns. The presentation of the fiscal impact of a number of alternatives is an attempt to bracket the range of likely futures.

Table 1 shows the base case scenario and the four impact scenarios. All five scenarios are based on the same economic future and the same growth of total metropolitan population. The difference in Anchorage resident population in each scenario results from the construction of the KAC. The differences between population in the base case and in each scenario is the impact population--those people who move to the Mat-Su Borough because the Knik Arm Crossing is built. These people would have lived within the Municipality had

there been no KAC. The four impact scenarios show the effect of varying two of the determinants of settlement patterns, the relative accessibility of the Point MacKenzie area and the density at which settlement in this area is allowed. Of the two proposed crossing corridors, Elmendorf and Downtown, the Downtown crossing would make the area relatively more accessible; we expect greater population to move to the Mat-Su Borough, the greater the accessibility. The other variable in the scenarios is the amount of land developed and the density of its development; the higher the density of development, the greater would be the impact population, all other things being the same. The scenarios show a range of year 2000 impact population from 7,000 in the Elmendorf-Low Density case to 29,300 in the Downtown-High Density case.

TABLE 1. ANCHORAGE OFF-BASE POPULATION (000)

Scenario	1990	1995	2000
Base Case-No Crossing (B)	236.8	267.8	295.8
Elmendorf-Low Density (EL)	236.2	263.6	288.8
Elmendorf-Mid Density (EM)	235.5	260.3	282.9
Downtown-Mid Density (DTM)	234.8	257.2	276.1
Downtown-High Density (DTH)	234.0	251.0	266.5

SOURCE: Goldsmith and Reeder, 1983, and Knik Arm Crossing Group, 1983.

Models

Our projections of fiscal impact are made with a forecasting model (see the model description in Appendix A). Forecasting models offer no magic solution to the problem of uncertainty about the future. Models are analytic tools which, by themselves, cannot provide a certain forecast of the future. Forecasting models are helpful in limiting or narrowing the range of uncertainty about the future.

Models are based on identified persistent relationships between variables. These relationships can be either observed from past changes or based on known or derived theories. The relationships should be logically consistent. A major assumption in the use of a model is that the assumed relationships do not change, or change in a predictable way, over the forecast period.

Forecast models allow the projection of a set of variables of interest (endogenous) from the forecast of a set of variables (exogenous) which can be easily projected in the future. This reduces the user's task to estimating the future path of variables he knows more about or can more easily learn about. The model provides the logical link between those variables the user "knows" about and those he "wishes to know" more about.

The projections of such a model are conditional. The level of endogenous variables will be obtained if the model relations are constant and if the exogenous variables obtain their forecast level. If a decision maker can place probabilities on the range of future exogenous variables, repeated runs of the model can be used to estimate the range and probability of future levels of the variables to be explained. While models will not eliminate uncertainty, they allow us to estimate the sensitivity of our forecast variables to changes in the input variables.

We use the forecasting model to estimate the fiscal impacts. Impacts are estimated by comparing projections made when no KAC is assumed with projections made including a Knik Arm Crossing. For any one variable, the impact of the Crossing can be found by subtracting the projected level in one scenario from another.

The values of parameters used in this study are presented in the following sections. The fiscal impact presented in each scenario differs as a result of different assumptions about the future. Throughout all projections, two common assumptions which are important to the results are maintained. First, our analysis assumes that the same standard of Municipal services will be maintained throughout the study period. Local governments can vary the types and quality of service provided in response to any number of factors. This decision, however, is a political decision, and we cannot forecast the direction and extent of these changes. Secondly,

in all scenarios we assume no new or expanding external sources of revenue. Because state transfers have been an important revenue source for the Municipality, the future of these revenues will affect the projected fiscal future. We assume no additional external sources of revenue and, instead, project the increasing importance of local revenues. These assumptions are consistent with the notion of declining state revenues as a result of a decline in Prudhoe Bay petroleum production.

II. FISCAL CHANGES IN ANCHORAGE

Public Expenditures

To determine fiscal impacts, it is necessary to examine relevant public sector expenditures which are expected to occur in the absence of the Knik Arm Crossing. These costs are then compared with the costs expected in each of the KAC scenarios. The actual level of government expenditures devoted to providing public goods and services will depend upon many factors, including the level and quality of service desired, the population of the area, the rate of growth and density of that population, and the efficiency with which services are provided. In turn, the level and types of services demanded depend upon such things as income, tastes, and demographic composition of the population.

Our approach to public costs for the Municipality of Anchorage is to assume (wherever possible) that the existing level and types of services currently provided are maintained throughout the study period. In those instances where the data are unclear as to the cost of maintaining current service levels, we have tried to approximate those costs.

Costs are divided into two major categories: (1) program activities supported by tax and other sources of general revenues (i.e., those public goods and services contained in the Municipality's and the Anchorage School District's annual operating

budgets) and (2) capital expenditures. The costs for the Municipality and the Anchorage School District are examined separately and then totaled for the final results.

The operating costs and capital expenditures of municipally owned utilities and other enterprise funds are not estimated. Although population and service requirement changes for these entities are not irrelevant and may result in fee schedule changes, the primary emphasis of this study is on services supported by local taxes and other general revenue sources (e.g., state and federal shared revenues). Utilities are predominantly supported by user charges, and it is assumed that this will continue to be the case over the study period.[1] An attempt to estimate the fee structure for utilities between now and the year 2000 with and without the KAC did not appear to be a realistic exercise within the context of this study.

The general program (or operating) and capital costs of the Municipality and the School District are expected to vary among the cases examined (no crossing versus four KAC scenarios) as a function of differences in settlement patterns. For example, a slower growth rate in the Anchorage Bowl associated with the existence of the KAC will lead to more slowly growing demands on the Anchorage school

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[1]The continuance of the practice by the Municipality of issuing self-supporting general obligation bonds for utilities (e.g., Eklutna project) is considered in estimating a debt ceiling for the Municipality.

system as relatively more children attend schools in the Mat-Su Borough. The costs associated with other categories of services such as fire and police services will not be as directly affected. Although a slower rate of population growth within the Municipality will reduce residential demands for public protection, these services must still be provided to commuters to Anchorage from the Point MacKenzie area. Thus, the cost reductions are expected to be somewhat muted by the increase in commuter demands.

The specific assumptions and estimation procedures used to gauge the changes in public costs are explained in Chapter III.

Public Revenues

Public sector revenues are also affected by changes in settlement patterns. Consistent with the approach taken for public costs, the types of revenues examined here are those which are used to fund general government operations for the Municipality and the school district. Intergovernmental grants which are not included in the Municipality's annual budget are excluded from consideration. State funding of both operating and capital projects has been a predominant feature of the revenue picture over the past few years. The possible levels of such funding over the study period are not known.

Currently, the Municipality's operating budget is financed by local taxes (41 percent), other local sources (fees, licenses, and interest earnings) (18 percent), state operating revenues (31 percent), and federal revenues (10 percent).

The Anchorage School District's general fund revenues are primarily from state sources (75.45 percent for fiscal year 1984), complemented by local tax support (24.4 percent) and a small amount from federal sources (.15 percent). State funding of schools is largely dependent upon the number of students within the district and, thus, upon population. Likewise, general government revenues from state and federal sources are based partially on population. Local tax revenues for both Municipal and school district purposes are indirectly population related, since the property tax base (total assessed property value) is in part a function of population growth and land availability. Property taxes comprise over 90 percent of local tax collections.

In October 1983, Anchorage voters approved an amendment to the Municipal charter. This amendment, known as Proposition 24, places legal limitation on the amount of Municipal taxes that can be levied. While the interpretation of the specifics of this limitation have yet to be fully agreed upon, the general thrust is that tax collections are allowed to grow at a rate based upon growth in population and price level. Major exceptions relate to taxes on new construction or improvements, revenues necessary to fund debt

service, and funding for other expenditures which are granted voter approval.

The extent to which Proposition 24 may alter the Municipality's long-term fiscal picture is uncertain. Much will depend upon the willingness of local voters to approve exemptions or additions to the allowable level of taxation. Aside from this major uncertainty, it is clear that a slower growth rate in population, which is predicted in all of the KAC cases examined as compared to the base case (no crossing), will allow for slower growth in tax collections under the formula contained in Proposition 24. We have, therefore, included in our results a rough approximation of how differences in settlement patterns may be reflected in the tax constraint provided for in this charter amendment.

Measures of Fiscal Impact

An ideal fiscal impact analysis would examine the full range of changes in service demands and costs which would occur in the absence of the Knik Arm Crossing and compare these costs with those which would occur with a Knik Arm Crossing. A similar approach would be taken on the revenue side with a full examination of all revenues and expected changes in all sources with and without a crossing. The net effect of these changes on a yearly basis between now and the year 2000 could then be tallied and expressed in terms of present value. The range and depth of information necessary to make such a calculation was not available for this study.

As mentioned earlier, fiscal estimates for Municipal utilities have been excluded from this study. The information on demand for utilities and supply response to differences in the demand in terms of capital facilities over the next fifteen to twenty years is not available. How these expenditures might be translated into fee schedules in the future is a problem at least equally complex. Our assumption for this study is that although utility spending and revenues (fees) will certainly change over time and are likely to be somewhat affected by the KAC, these changes will not be reflected on the tax-supported, general revenue side of the budget. Thus, although fee changes are an important consideration to utility users, they will not affect the net fiscal impact of the Municipality, as examined here.

A similar problem arises when one attempts to design a base case for expenditures against which to compare changes associated with the KAC scenarios. What level and types of capital expenditures will be undertaken over the next twenty years? Although there do exist some service standards for particular kinds of facilities, the actual level of expenditures is not securely tied to those standards. Other factors such as the availability and source of funds for capital spending (especially legislative grants), administrative priorities, and current public preferences play a vital role in the formation and implementation of capital spending plans. None of these factors is easily projected. Thus, for purposes of this study, the composition of the base case capital

expenditures is dealt with in specifics for only two categories of facilities. For the remainder of the capital budget, assumptions are made as to an average amount of yearly expenditures and the proportion of these expenditures which might be financed through general obligation bonds. We then estimate the impact of this capital spending scenario on debt service and debt service per capita.

Transportation (streets, highways, etc.) is the major area of capital expenditure impact expected to result from the Knik Arm Crossing. This important fiscal impact is being separately estimated by the Transportation Section of the Municipal Department of Community Planning.

Given the areas of uncertainty and incomplete data noted above, our approach is to present several aspects (or measures) of fiscal effects rather than a single number representing the total fiscal impact. Although these measures taken alone are not comprehensive (or additive), each addresses an aspect of the fiscal impact of the KAC and gives decision makers a basis for evaluating the fiscal questions which attend the construction of a bridge across Knik Arm.

The aspects of the fiscal question which are addressed in the next two chapters are:

- Net budget impacts for general revenue-supported Municipal activities and the Anchorage School District. This measure includes a general estimate of debt service.

- Capital impacts for population-sensitive facilities (schools and parks).

- Debt service per capita resulting from general assumptions about future capital spending and bonding activities.

- Impact of Proposition 24 on net fiscal results.

III. SPECIFIC ASSUMPTIONS

Municipal Operating Expenditures

The first category of costs, general municipal program activities, includes the services funded through the Municipality of Anchorage (MOA) annual operating budget. We have broken these expenditures into the following categories:

- General Government (e.g., municipal assembly, mayor's office, management support services, internal audit, equal rights commission)
- Public Safety (e.g., police protection, fire protection, and transportation inspection)
- Public Works (e.g., street maintenance, building safety, engineering, public transit, traffic engineering, equipment maintenance)
- Health and Welfare (e.g., health and environment, social services, related grants)
- Recreational and Cultural (e.g., parks and recreation, libraries, museum)

An assumption was made as to the proportion of the expenditure for each component of each category which was primarily dependent on population and the proportion which was fixed, i.e. not sensitive to the level or marginal changes in population. These assumptions were checked against available information regarding the average number of employees per 1,000 population of U.S. cities of comparable sizes and an examination of how such averages tend to change with city size. As further background for our assumptions, the results of empirical studies of economies of scale in the provision of

municipal services were examined (Hirsch, 1984). In general, these studies found that the average unit costs are not likely to change significantly over a fairly wide range of output. In particular, these studies were unable to document economies of scale in provision of services such as police, primary and secondary education, and found only minor economies in the provision of fire services.

In applying these findings to the Anchorage situation and weighting population-sensitive budget components by their relative sizes, we calculated that approximately 65 percent of the services covered in the municipal budget are sensitive to population. A per capita cost multiplier was derived from this estimate. The assumptions regarding population sensitivity imply that approximately 35 percent of municipal services covered are not primarily population related and will tend to increase with the price level but not specifically as a response to growing population. The types of activities which fall into the nonpopulation-sensitive grouping included such items as the assembly and the mayor's office, central administrative services (excluding those services provided other departments); a portion of maintenance and snow removal of existing streets; a portion of operations of existing recreation and cultural facilities. These expenditures were viewed essentially as fixed costs which would not be affected by marginal increases or decreases in population over the study period. Many municipal services are provided to businesses as well

as to households. It was assumed, however, that the proportion of business-related costs to residential costs would remain constant.

SUBURBAN POPULATION EFFECT

Construction of the Knik Arm Crossing will reinforce the current phenomena of the suburbanization of the Anchorage metropolitan population. For fiscal studies, suburbanization is important because it means the same metropolitan population will be served by more than one government. Suburbanization means that the consumers of the services of a local government may include more than the residents of that jurisdiction. Under the current method of financing local government, this results in a separation of revenue and expenditure effects of population.

The Knik Arm Crossing will increase this suburban fiscal effect since more people will move to the Mat-Su Borough. This reduction in Anchorage population will not have a proportional effect on both revenues and expenditures. While lower population will mean lower property values and reduced transfers, it will not have the same effect on expenditures. Residents of the Mat-Su Borough will continue to consume services in Anchorage; as a result, Municipal expenditures will not be lower in proportion to the lower population.

We include this suburbanization effect in our analysis by examining the influence of the "impact population" on Anchorage expenditures. The impact population includes (in each scenario) an

estimate of those residents who would live in Mat-Su rather than Anchorage as a result of the bridge. We assume this impact population continues to affect Municipal expenditures, although by an amount less than Municipal residents.

Mat-Su residents are assumed to affect Municipal expenditures in connection with working and shopping trips to the Municipality. Nonresidents do not affect all categories of expenditures--only those which serve the commercial sector. This includes fire and police services, general government activities, and public works. Each of these Municipal sectors serves both residential and business interests. The effect of a Mat-Su resident on these sectors is assumed to be less than an Anchorage resident because it reflects only service provided to business interests serving this population. In other words, population as a determinant of Municipal expenditures represents both the residential and commercial effects. The sensitivity of Anchorage expenditures to Mat-Su population depends on the Mat-Su population's use of the Anchorage commercial sector.

The following specific assumptions were used to estimate the effect of the impact population of Municipal expenditures:

- The commercial portion of the population expenditure multiplier was thirty-six percent of the total in 1990. This represents the share of real property which is commercial (MOA Financial Report, 1983). Each Anchorage resident has the effect of 2.8 Mat-Su residents on expenditures. This assumption means that each impact resident of the Mat-Su Borough results in $1,337 of expenditures by Municipality per year.

- The effect of the Mat-Su population will change as the population in the Point MacKenzie area grows. As more

commercial activity takes place in the Point MacKenzie area, residents will make fewer trips to Anchorage, which will result in a reduced expenditure impact. This parameter (.36) was assumed to change in response to the growth of the impact population. The pattern of change reflected the change in resident-serving employment per capita found in Eagle River, Mat-Su, and Anchorage (State of Alaska, 1984). The per capita resident-serving employment in Anchorage was assumed to represent consumption. The suburban trip parameter was assumed to decrease as the forecast per capita employment moved toward the Anchorage level. This parameter falls from .36 in 1990 to the level shown in Table 2 for each scenario.

TABLE 2. SUBURBAN FISCAL EFFECT ASSUMPTIONS

	2000	
Scenario	Per Capita Employment	Fiscal Effect Parameter
Downtown-High	.60	.20
Downtown-Mid	.41	.25
Elmendorf-Mid	.20	.31
Elmendorf-Low	0.00	.36

CAPITAL EXPENDITURES

Planning Department staff examined several categories of capital facilities in order to determine which types of capital requirements might be affected by the differences in settlement patterns associated with the KAC. The analysis covered the following types of facilities: parkland, schools, water, sewer, storm water, snow disposal sites, libraries, police, and fire. The types of facilities expected to be significantly influenced by the population changes envisioned in the KAC scenarios were narrowed to parkland

acquisition and school facilities. Appendix B contains the assumptions and procedures used by the Planning Department staff.

Parkland Acquisition. The primary factors from this municipal study which we incorporated into our work were the types of facilities to be considered and the municipal standards which define how population changes are to be translated into capital expenditures. The parkland acreage standards and the current municipal holdings are presented in Table 3 below.

Column 3 of Table 3 gives average acres per 1,000 population for each park type, based on total acres of parkland held within the Municipality. A more detailed analysis, based on ten subareas of Anchorage, shows deficits (cases in which standards are not met) by subareas which currently exist and are expected with continued population growth. For example, although community parkland on average appears to exceed the national standard, there are three subareas which include no current holdings of this land category. Thus, a subarea analysis yields parkland deficits which require land acquisition over the study period for both community and neighborhood parkland. Details by subarea are contained in Appendix B, prepared by Planning Department Staff.

The amount of parkland which may be purchased between now and 1990, the beginning of the KAC impact period, is not estimated. Potential expenditures for this purpose in the near term are assumed

TABLE 3. PARKLAND STANDARDS AND CURRENT AVAILABILITY

(1) Type of Park	(2) Standard[1] (acres/1000 population)	(3) Current[2] (acres/1000 population)
Neighborhood	2.5/1,000	1.76/1,000
Community	2.5/1,000	3.1/1,000
Urban	5.0 1,000	10.5/1,000
Regional	20.0 1,000	40.4/1,000

[1]Parkland acreage standard from the National Recreational Park Association, used in Anchorage since 1974.

[2]Population figure of 208,800 used in these calculations is an estimate of permanent Anchorage population for 1984, excluding on-base military personnel.

to be contained in the general capital budget estimate, which is discussed below. We do not assume that the Municipality will meet the standard in all subareas by the year 1990; but we do assume that after 1990 every increase of population of 1,000 persons will result in the required acquisition of 2.5 acres for community and/or neighborhood parklands in those subareas where deficiency from the standards exist. No acquisitions for urban or regional parks are required throughout the study period.

The KAC scenarios with their slower population growth for the Municipality reduce the average acreage requirement in the range of six to fourteen acres per year in 1995. This reduced requirement is

translated into a reduction in required capital expenditures by applying an average per-acre cost of $50,000 in 1984 dollars.

School Facilities. Schools are the second category of capital facility determined to be population sensitive within the range of population differences associated with the KAC. To measure this capital facility impact, we calculated the number of schools which will be needed to the year 2000. Facility acquisition between 1984 and 1992 was based on the School District's 1984 Capital Improvement Program. Population projections used by the Anchorage School District for planning purposes were compared with those used in this study (Goldsmith and Reeder, 1984) for the base case and for each of the KAC scenarios. A threshold enrollment of students was used to determine when a new school will be needed. Calculations were made by the ten subareas and then aggregated for a total for the Anchorage School District. It was assumed that no schools would be shut down; rather that the effect of slower population growth would be later construction of new facilities.

Once the numbers and types of facilities required were determined, these facilities were cost out in nominal dollars of the year in which they were built. Cost estimates were developed in 1984 dollars and were then inflated to the appropriate year assuming an annual inflation rate of 5 percent. Land prices assumed were $54,000 per acre (for large parcels) within the Anchorage Bowl and $25,000 per acre outside the Bowl. For the facilities themselves,

cost estimates were based on those used for similar facilities in the Anchorage School District 1984-1994 Capital Improvement Program. Elementary Schools were estimated to cost $10.2 million; junior high schools, $20 million ($740,000 average cost per room); and senior high schools, $30 million. It was assumed that costs of major repairs or replacement for existing schools would not differ among the base case and KAC cases. Assumptions regarding the proportion of school construction to be financed with general obligation bonds and the amount of such debt service to be reimbursed by the state are discussed below.

Debt Service. We incorporated the effect of capital expenditures on the Municipal and School District budgets by calculating debt service schedules and adding these annual debt service requirements to the respective operating budgets. Debt service on existing debt was taken from the Municipal debt schedule dated December 31, 1983. An additional $10 million in general obligation bonds for roads and drainage projects were approved by voters in October 1983, and the Municipality intends to issue those bonds in June 1984. We have assumed that these bonds will be of fifteen-year term with an interest rate of 10 percent.

The total amount of capital expenditures which will be bonded between now and the year 2000 is, of course, uncertain. For the years 1985 through 1989, we have assumed the amounts contained in the 1984 Capital Improvement Plan. Between 1990 and 2000, we assume

that approximately $25 million (in 1984 dollars) of bonds are issued annually for general government purposes. These purposes would include such items as road and drainage projects, parkland acquisition and development, and public buildings. Capital expenditures for these and other projects could be well in excess of the figures used here. We are concerned at this point only with the amount of capital spending financed with general obligation bonds. The general obligation bonds for general government purposes issued between 1990 and 2000 are assumed to have fifteen-year terms, 10 percent interest costs (calculated on an annual basis), with an equal payment structure.

General obligation bonding is also assumed for school facilities. In the case of these facilities, the amount bonded is based upon estimates of the number of and costs for schools to be constructed between now and the year 2000. We have assumed that 25 percent of the costs of new facilities incurred through 1989 will be financed by general obligation bonds, with this percentage rising to 50 percent for 1990 and thereafter. This reflects our assumption of a decline in the direct legislative funding of school facilities as state petroleum revenues decline in the 1990s. For school bonds, we have assumed a bond structure similar to that described for general government purposes; however, the length of term is twenty years.

To ensure that the amount of debt provided for by these assumptions was within reasonable limits for the Municipality, a "debt ceiling" was calculated. This ceiling was based on a rule of thumb that debt should not exceed 5 percent of a jurisdiction's property values. In every year of the study period, the debt assumed here fell far below such a limit. This would leave room for the Municipality to continue its current practice of issuing "self-financing" general obligation bonds for utility projects such as the Eklutna Water project.

Differences in the amount of annual debt service among KAC scenarios result from the impact of differences in settlement patterns on the acquisition of parkland and the construction of school facilities. The higher the impact population (i.e., the lower the Anchorage population), the lower will be the necessary expenditures for parkland acquisition and school construction. For all cases, the amounts bonded were rounded: for general government, to the nearest $250,000; and for schools, to the nearest $1 million. The resulting differences in per capita debt service are discussed in Chapter IV.

Municipal Revenues

Municipal general government revenues contained in the 1984 Approved Municipal Budget totaled nearly $164 million. The percentage distribution of these revenues by source is shown in Table 4, below. In order to evaluate the fiscal impact of the change in settlement patterns brought about by the KAC, it was

necessary to estimate base case (no-crossing) revenues between now and the year 2000 and compare these revenues with the revenue streams estimated for each of the KAC scenarios. Since property tax revenues are generally a residual category (i.e., the mill rate is calculated on the basis of the difference between expenditures and revenues from other sources), we have estimated assessed property value (the tax base) rather than the amount of tax from this source at current rates.

TABLE 4. GENERAL GOVERNMENT REVENUES
1984 APPROVED MUNICIPAL BUDGET

Revenue Type	Percent of Total Revenues	Percent of Revenue Type
Local Tax Revenues	41	
Property Tax	36	89
Hotel/Motel Tax	2	6
Motor Vehicle Reg. Tax	2	5
Local Nontax Revenues	18	
User Fees, Licenses, Penalties, Other	14	76
Interest	4	24
State Revenues	31	
Municipal Assistance	19.7	64
Revenue Sharing	10.6	34
Other	0.7	2
Federal Revenues*	10	
Revenue Sharing	9.3	93
Other	.7	7

*Numbers updated by Office of Program Planning and Budgeting, April 17, 1984.

SOURCE: 1984 Approved Budget, Municipality of Anchorage.

LOCAL TAXES

One of the major problems faced in fiscal impact analysis is the limited data available for estimating important parameters. The local tax sector is unlike the other revenue and expenditure sectors in that historic, time series information was available, and regression analysis could be used to estimate parameters. Two sets of regressions were run, direct taxes and property values.

Table 5 shows the results of two regressions explaining the hotel-motel tax revenues and the motor vehicle registration tax (also called auto fees). The motor vehicle registration tax is provided by state statute (A.S. 28.10.431) as a tax option which municipalities can impose in lieu of local personal property taxes on motor vehicles. If a municipality chooses to impose this tax, it uses the fee schedule established in the state statute, and the tax is collected by the Alaska State Department of Public Safety as part of its licensing activities. The Department then returns these revenues to the municipality after deducting a fee for collection. The tax varies by type, age, and use of the vehicles being registered but is a set dollar amount, rather than a percentage of value. The fee schedules have not changed over the time period for which data was available on the Municipality's revenue from this source. Assuming the rate schedule remains constant, inflation will not be a factor in revenues collected. Thus, this tax declines on a real per-unit basis, as the price level rises. Tax revenues from the motor vehicle tax were estimated as a function of lagged

population. The regression performs fairly well, explaining 62 percent of the variation. The remaining variation may be, in part, the result of year-to-year differences in enforcement of (or compliance with) state licensing provisions. Further, since different fees are charged for vehicles depending upon their age, information on factors which influence the age distribution of vehicles would likely improve the results. Since motor vehicle registration taxes are a function of population, these revenues will be smaller in the KAC case than in the base case.

TABLE 5. TAX REGRESSIONS*

Motor Vehicle Registration Taxes (Auto Fees)

Auto Fees = -4616.8 + 41.56 * Population (-1) R^2=.62

Hotel-Motel Tax

Hotel-Motel Tax = -.471 + .002 * Visitors R^2=.83

*All coefficients significant at the 90 percent level.

The hotel-motel tax is an 8 percent levy upon the value of hotel and motel accommodations sold to nongovernmental occupants. This tax is in the form of a rate (percentage of value), so revenues increase with increases in the price of rooms. The real value of

revenues from this source was estimated as a function of the number of visitors to the area. This simple formulation performs well, explaining 80 percent of the variation. Actual receipts on a year-to-year basis will depend not only on visitors (or rather visitor days) but on the amount of hotel/motel capacity (rooms) and the changing cost for these rooms, be it increasing more slowly or more rapidly than the overall rate of inflation. Since hotel/motel tax revenues are not population sensitive, there are no differences in these revenues among our scenarios.

Table 6 shows two regression equations used to explain real and personal property. Personal property is explained well by lagged population; this equation explains over 90 percent of the variation in personal property values over the historic period. The change in the value of real property is explained by the lagged change in population; this assumes a major reason for the increase in real property values is the investment to serve new population with housing and commercial space; the lags reflect lags in the construction process. This equation explains over 80 percent of the historical variation in the change in real property value. Both of these equations were estimated in constant dollars.

Property taxes are calculated in our projections as the residual revenue source, that is the amount required to make total revenues equal total expenditures. In our projections, the tax rate is found in the base case, and this base case rate is applied to each impact case.

TABLE 6. PROPERTY VALUE REGRESSIONS*

Personal Property Value = -190.38 + 3.0011 * Population (-1) R^2=.96
(in 1967 dollars)

Real Property Value = 34.43 + 9.62 * (Population (-1) - Population (-2))
(in 1967 dollars) + 6.39 * (Population (-2) - Population (-3))
R^2=.83

*All coefficients significant at the 90 percent level.

LOCAL NONTAX REVENUES

User fees, licenses, franchises, reimbursed costs, contributions from other funds, and penalty and interest on delinquent taxes comprise the major part of local nontax revenues. We have assumed that this category of revenues will, over the long run, increase with inflation and population. Although the majority of the fees appear to be set amounts (rather than percentage values or rates), we are assuming that these fees will periodically be adjusted to reflect changes in the cost of supplying services. Similarly, as population increases, the number of users increases, resulting in higher collections. Further, given Proposition 24, the tax limitation charter amendment, it appears likely that more attention will be given to nontax revenues as an income source.

The second category of local nontax revenues is interest earnings on the Municipality's short-term cash flow. Since the

Municipality's receipt of revenues and expenditures does not occur simultaneously, interest earning deposits are made in local financial institutions. We have assumed that the amount of these earnings will depend upon the size of the budget (a proxy for total income received) and the rate of interest. Having reviewed historical trends in short-term interest rates we have selected a rate of 8 percent and have further assumed that this rate should apply to half the dollar amount of the budget. This reflects the fact that only a portion of receipts will be available for deposits throughout the year.

STATE REVENUES

Over 30 percent of the Municipality's general government revenues are currently received from the State of Alaska. This percentage is exclusive of capital and special operating grants which are also received from state sources. Two state programs--municipal assistance (A.S.43.20.016) and state revenue sharing (A.S.29.88 and 29.89)--comprise 98 percent of revenues from this source. The municipal assistance and revenue sharing programs allow for distribution of legislatively appropriated funds among eligible localities. Municipal assistance, although statutorily established as a percentage of the state's receipt of corporate income taxes, is subject to appropriation of more or less than that target amount. The total appropriation is distributed among eligible recipients according to a formula in which population is the most important factor.

State revenue sharing is also subject to total appropriation and is distributed according to a formula which includes population, relative local ability to generate revenue (measured by property tax base), and local tax burden (local revenues generated relative to local tax base).

Since population is an important factor in the distribution of both of these state programs, it might be expected that these revenues would vary significantly with the differences in settlement patterns associated with the KAC. To the extent that more population locates in the Mat-Su Borough than within the MOA, the lower would be the Municipality's share of these state funds. There may, however, be an overriding factor which alters this distribution. As noted above, the state legislature may choose to over- or underappropriate the total amount of funds devoted to these programs. The amounts appropriated to these programs in fiscal years 1983 and 1984 remained essentially constant in nominal terms, as did the Governor's request and the budget passed by the House of Representatives for fiscal year 1985.[2] In other words, state appropriations have not been increasing to allow for population growth or inflation. As state revenues begin to fall in the 1990s, it is expected that these programs will be subject to even greater pressure. To account for this, we have assumed in our base case

[2]The Senate budget for FY 1985 was somewhat higher than that of the House. These differences were resolved by the Budget Conference Committee at a level above the Governor's request and are now subject to gubernatorial approval.

and KAC scenarios that the Municipality of Anchorage will continue to receive the current nominal dollar amount from these state sources over the study period. Alternative assumptions are discussed along with the sensitivity tests contained in Chapter IV.

The third category of state revenues is entitled "Other" and contains shared taxes such as the fish tax, liquor licenses, tax on amusement and gaming devices, aviation fuel tax, tax on electric cooperatives, and other minor sources. Although these taxes are currently budgeted by the state for fiscal year 1985 at the 1984 level, they did increase slightly between 1983 and 1984. We have assumed that the receipts from these taxes will increase over time with inflation and population. Although this assumption may not be appropriate for a single tax in the group, it appears a reasonable approximation for the category as a whole over the long run.

FEDERAL REVENUES

The main component of local general revenues from the federal government is the federal revenue sharing program. Appropriated funds are distributed to local governments according to formulas which incorporate population, tax effort, relative income, and urbanized population. Anchorage's share depends not only on what happens here, but local changes relative to changes in all eligible communities across the United States. Thus, estimation of the level of future revenues from this source is highly problematic.

Other federal revenues, amounting to slightly more than one million dollars, come from federal payments in lieu of taxes, mass transportation grants, and national forest payments. These sources were lumped together with federal revenue sharing payments and assumed to increase with inflation over the study period. Since we have not assumed a direct linkage between federal revenues and population, these revenues do not vary among our impact cases and thus do not influence the net fiscal impact results.

Table 7 below summarizes the assumptions made by major revenue type.

TABLE 7. REVENUE ESTIMATION ASSUMPTIONS

	Function of:
Local Tax Revenues	
Property Values	Population growth; inflation (see regression equations)
Hotel/Motel Tax	Number of visitors; inflation
Motor Vehicle Registration Tax	Population (lagged)
Local Nontax Revenues	
User fees, Licenses, etc.	Population; inflation
Interest earnings	Size of budget, interest rate
State Revenues	
Municipal Assistance and State Revenue Sharing	(1) Constant nominal dollars (2) Populaton and inflation (for sensitivty testing purposes)
Other State Revenues	Population; inflation
Federal Revenues	Inflation

Anchorage School District Fiscal Assumptions

The Anchorage School District (ASD) budget is comparable in size to the Municipality's general government budget. In fiscal year 1984,[3], the ASD budget was $212.3 million; the FY 85 budget was $231.8 million. This budget has grown by $135.6 million since FY 76, at an average annual rate of 10.3 percent a year. The growth in the budget reflects changes in the cost of living, number of students, number of schools, and the level of schooling provided.

The construction of the Knik Arm Crossing will affect both the revenues and expenditures of the ASD. The primary effect will occur because there will be fewer students to serve in the ASD. Fewer students will also mean fewer schools, although the relation will not be proportional. This section describes the specific assumptions used to project the impacts of the KAC on ASD budgets.

EXPENDITURES

Four factors determine the growth of school district expenditures: increases in the cost of living, increases in the service standard, increases in the number of facilities, and increases in the school population. Knik Arm will affect the expenditures through changes in the facilities required and school population. We did not account for changes in service levels; this is a political decision, and we cannot hope to forecast this decision.

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[3]The ASD operates on a fiscal year from July to July.

We assume then that the future growth of revenues will be a function of growth in population, facilities, and cost of living.

Our expenditure parameters are based on an examination of the FY 84 and 85 budgets. We divided budget units into the following three groups:

- Fixed Expenditures: The expenditures which are constant in real dollars throughout the study period. These include primarily district-wide administrative functions.

- Population Sensitive: The expenditures which are constant in real per capita dollars. In real terms, these expenditures increase with population. These include student-specific expenditures at the district level such as student services, art and music, and special services. Population-sensitive expenditures also include expenditures at specific facilities, primarily faculty salaries and benefits.

- Facilities Sensitive: Certain expenditures are assumed to be related to the number of facilities and to be independent of the population in each facility. These facility-specific expenditures include such costs as Principal salaries and operations and maintenance. They are distinguished by secondary and primary facilities.

- Debt Service: This includes principal and interest on the debt. Debt is related to the capital expenditure made over time.

Table 8 illustrates the specific expenditure assumptions used in our projections. We assume the majority of expenditures are population sensitive and that only a very small share (8 percent) will not increase over the period. This suggests the presence of limited economies of scale in the provision of school services. This assumption is supported by the economic analysis of public school expenditure which funds no significant economies of scale (Hirsch, 1984).

TABLE 8. SPECIFIC SCHOOL EXPENDITURE ASSUMPTIONS

	Expenditure (millions)		Projection Parameter
	1984	1985	
Population Sensitive	141.61	152.11	$3,840 per student
Facilities Sensitive			
Primary	18.45	20.95	$380,000 per school
Secondary	20.03	21.80	$1,442,000 per school
Fixed	13.09	17.61	$15.35 million
Total	193.18	212.47	

SOURCE: Anchorage School District, Proposed Financial Plan, FY 1984-85.

Examining past expenditures also supports this assumption. Table 9 shows two periods over which real (nondebt service) spending per student is similar. In 1982, real per capita spending increased by $300; this jump could have resulted from the increase in school facilities but was probably an increase in service standards in response to increased state revenues. Historic analysis suggests that assuming a constant level of real per capita spending at a given level of service will provide a good projection of the future.

TABLE 9. HISTORIC SCHOOL BUDGET

Fiscal Year	Students	Budget	Debt Service Share	Per Student	Real Dollars (1967=100) Budget	Per Student	Net of Debt Service Per Student
1976	38.9	96.168	.125	2,473	63.144	1,624	1,421
1980	36.9	130.969	.096	3,550	63.118	1,711	1,547
1981	34.5	137.999	.091	4,000	61.442	1,781	1,619
1982	36.0	158.583	.068	4,410	65.557	2,113	1,969
1983	36.8	188.180	.085	5,111	73.623	2,000	1,830
1984	39.4	212.270	.095	5,390	80.162	2,035	1,842
1985	39.8	231.826	.086	5,826	82.984*	2,083	1,904

*Assumes CPI increase at 5.5 percent 1983 to 1984.

REVENUES

The major source of revenues for education in Anchorage is the state; state revenues provided almost 73 percent of total requirements in FY 84. In contrast, local taxes provided approximately 22 percent of the total requirements in FY 84. Over the last ten years, local tax revenues accounted for as much as 29 percent and as little as 16 percent of total requirements; on average only 22 percent of total ASD requirements were provided by local revenues. The remainder of the sources (3 percent in FY 84) are federal transfers (R.O.T.C. and through PL 81-874) and nontax local revenues.

State contributions are from two primary sources, the Foundation Program and State Reimbursement for Debt Service. These programs are a significant portion of Municipal revenues. Both of these programs have experienced rapid growth in response to the rapid rise in state revenues associated with petroleum production at Prudhoe Bay. Foundation support for Anchorage schools increased almost 200 percent in the ten-year period (1976-1985). These major revenue sources are subject to the availability of funds and political decisions. These determinants mean a high degree of uncertainty must be associated with any given assumption about state revenues.

Nontax revenues were assumed to be one of three types:

- Fixed Revenues. Revenue sources which remain constant in real dollars. The primary sources were state tuitions and federal PL81-874 transfers.

- Population-Sensitive Revenues. The majority of nontax, nondebt service revenues are of this type. For these, real per capita revenues remain constant in real dollars, so they increase with the change in student population. These include the foundation program, state grants for student transportation, and federal R.O.T.C. transfers.

- Revenues as a Share. Two sources of revenue increase with factors other than students. These are interest on temporary deposits and state debt service reimbursement. Interest earnings are a function of the size of the budget; we assumed a return of 8 percent over one-half year (or 4 percent). State debt service reimbursement was assumed to be 70 percent of the debt service; this historical level reflects less than recent funding.

Table 10 shows the basic school revenue assumptions used in these projections.

TABLE 10. SPECIFIC REVENUE ASSUMPTIONS

	Revenue		Projection Parameter
	1984	1985	
Population	136.13	143.83	$3,660 per student
Fixed	4.14	5.04	$4.59 million
Share			
Interest	1.90	2.10	8% with 6 months average holding
Debt Service Reimbursement	14.18	17.55	70% state reimbursed

IV. THE FISCAL IMPACT OF THE KNIK ARM CROSSING

This chapter analyzes the effect of construction of the Knik Arm Crossing on the fiscal sector of the Municipality. We examine four different aspects of this impact:

- Budget impact under general assumptions about future debt service
- Capital spending impacts on those items isolated as being population sensitive
- Debt service impact
- The impact of the Proposition 24 spending limit

Each of these reflects one particular dimension of the overall fiscal impact. As discussed above, this approach substitutes for a complete impact analysis, which uncertainty about future public decisions makes impossible.

We analyze the impacts by comparing the future growth in the case where the KAC is not built to each of the four cases in which it is built. Each case differs among three sets of variables. First, each case assumes a different level of resident population growth in Anchorage; both total and school-age population differ. Secondly, the suburban externality effect differs in each case; the greater the impact population, the smaller the total requirements for MOA expenditures. Finally, each scenario differs in the assumed capital construction; this affects both debt service and facilities-related costs.

The Base Case

The base case provides the projection to which the impact cases are compared. In the base case, with no Knik Arm Crossing, total off-base population is projected to grow to 295,800 by the year 2000 (total population, 314,000). This population growth is accompanied by a 42 percent increase in school-age population by the year 2000. The school district is projected to add 6 secondary and 25 primary schools between 1984 and 2000 to meet this increased student population. The cost of living, as measured by the consumer price index, more than doubles (CPI in the year 2000 equals 242.1 where 1984=100).

These changes lead to the growth in Municipal fiscal sector described in Tables 11 through 13. From 1984 to 2000, total expenditures of the Municipality and the School District increase at an average annual rate of 7.8 percent. In real terms, when inflation is accounted for, expenditures increase at an average annual rate of approximately 2 percent. This slow rate of growth reflects our assumption that there will be no new services added or increases in service standards.

Our assumption about debt service shows a tripling over the period. This reflects an assumption that as state revenues decline, the Municipality must pick up a greater share of capital projects. In real per capita terms, debt service is projected to fall.

TABLE 11. BASE CASE FISCAL SECTOR

Year	Expenditures (millions) MOA	ASD	Total (in 1984 dollars)	Debt Service (millions) MOA	ASD	Total per Capita (in 1984 dollars)
1990	266.5	326.7	428.0	26.4	22.2	148
1995	385.4	481.2	474.1	43.0	35.0	159
2000	551.5	690.8	513.1	67.3	26.3	131

SOURCE: Fiscmod computer runs

TABLE 12. BASE CASE NONTAX REVENUE
(millions)

Year	Municipality of Anchorage	Anchorage School District
1990	118.9	243.0
1995	148.6	359.2
2000	190.0	520.9

SOURCE: Fiscmod computer runs

TABLE 13. BASE CASE TAX REVENUE
(millions)

Year	Total Tax	Municipality of Anchorage Nonproperty Tax	Mill Rate	Anchorage School District Total Tax	Mill Rate	Property Value
1990	147.6	11.9	.008	83.7	.005	18,009.5
1995	236.8	17.6	.008	122.0	.005	26,568.8
2000	361.5	25.2	.009	169.9	.004	38,249.6

SOURCE: Fiscmod computer runs

The major change in revenues is in the increased importance of local tax revenues. This results from the slow growth of nontax revenues; nontax revenues increase in real terms at a rate of only 1.1 percent a year. This reflects our assumption about the majority of state-shared revenues staying constant in nominal dollars. The increased importance of local tax revenues results in an increase in the mill rate even though property values increase.

Budget Impacts

The change in settlement patterns resulting from construction of the Knik Arm Crossing will be reflected in a decline in both revenues and expenditures by the MOA. Within our projection period (1990-2000), only in 1990 are the expenditures reduced by more than revenues (see Tables 14 and 15). In all scenarios, the negative net effect grows over the period; this result reflects two assumptions we have made. First, costs do not fall in proportion to the decline in population since Point MacKenzie residents continue to consume some Municipal services but do not contribute significantly to Municipal revenues. Secondly, the fall in the relative importance of state revenues over time means that revenues are increasing their population sensitivity since property taxes and property values are sensitive to population growth.[4]

[4]Property tax rates are assumed to be the same as in the base case; the net effect shows the amount which must be made up through increased taxes.

TABLE 14. REVENUE AND EXPENDITURE IMPACTS
(millions of 1984 dollars)

	Difference from the Base Case							
	Revenues				Expenditures			
Year	EL	EM	DTM	DTH	EL	EM	DTM	DTH
1990	-.5	-1.1	-1.8	-2.4	-.7	-1.4	-2.2	-3.0
1995	-5.9	-10.3	-14.9	-22.7	-5.1	-9.2	-13.2	-20.5
2000	-11.7	-20.3	-31.5	-45.6	-9.5	-16.4	-25.8	-37.2

SOURCE: Fiscmod computer runs

TABLE 15. NET FISCAL EFFECT
(millions of 1984 dollars)

(change in revenues minus change in expenditures)

	EL	EM	DTM	DTH
1990	.123	.277	.419	.597
1991	-.093	-.232	-.333	-.421
1992	-.228	-.535	-.826	-1.156
1993	-.343	-.764	-1.174	-1.55
1994	.538	-.942	-1.503	-1.962
1995	-.827	-1.126	-1.764	-2.183
1996	-1.579	-2.311	-3.313	-4.865
1997	-2.229	-3.120	-4.338	-6.453
1998	-1.963	-3.471	-4.736	-7.061
1999	-2.202	-3.785	-5.065	-7.671
2000	-2.25	-3.913	-5.718	-8.378

Table 16 illustrates the present value of the net fiscal impact for the projection period. The present value is the amount one would give up today to receive a certain flow of money in the future; since the flow in our case is negative, the present value would be the amount one would give up today rather than over time. Each future payment is discounted because having the money today allows a person to earn an investment return. The rate of return is the discount rate used to find the present value; in Table 16, a 3 percent discount rate was used.

TABLE 16. NET FISCAL IMPACT PRESENT VALUE
(millions of 1984 dollars)

	EL	EM	DTM	DTH
Present Value at 3% Discount Rate	-7.243	-11.896	-16.958	-24.519
Percent of FY84 Budget	1.9%	3.2%	4.5%	6.5%

As Table 16 shows, the Knik Arm Crossing results in a net negative impact on the Anchorage fiscal sector. The present value of this effect ranges from $-7.2 million in the Elmendorf-Low Density case to $-24.5 million in the Downtown-High Density case. These effects, while in millions of dollars, are not very significant when compared to the size of the budget. The negative fiscal effect is less than 7 percent of the combined MOA and ASD 1984 expenditures.

The fiscal impact of the KAC depends on the relative sensitivity to population of revenues and expenditures. If revenues are more sensitive to population changes, the fiscal effect will be negative; if expenditures are more sensitive, the net fiscal effect will be positive. Under our assumptions, revenues are more population sensitive. There is a significant share of costs which are fixed. In addition, a decline in population does not fully reduce expenditures since the nonresident impact population continues to affect expenditures. Locally collected revenues, on the other hand, are quite population sensitive. Our assumptions result in an increase in the share of revenues raised through taxes; holding the tax rate constant at the base case level means taxes are determined by property values which are determined by population growth.

Capital Impacts

The two facility types for which specific variation in costs were estimated are parkland acquisition and schools. The facility types were derived by the Planning Department staff from a longer list of capital spending requirements, most of which were deemed to be nonpopulation sensitive within the range of population effects associated with a KAC. Tables 17, 18, and 19 show the differences in facilities and capital expenditures which would occur for each scenario vis-a-vis the base case. These expenditure differences range from $13 million for the Elmendorf-Low Density case, to $50 million for the Downtown-High Density case. As expected, the slower the Anchorage growth (the more people move to the Point

MacKenzie area who would otherwise have lived in Anchorage), the larger will be the reduction in capital costs for population-sensitive facilities.

TABLE 17. DIFFERENCES IN PARK ACQUISITION REQUIREMENTS (in acres)

Year	EL	EM	DTM	DTH
1991	3.2	5.7	8.2	12.7
1992	3.2	5.7	8.2	12.7
1993	3.2	5.7	8.2	12.7
1994	3.2	5.7	8.2	12.7
1995	3.2	5.7	8.2	12.7
1996	6.2	8.4	10.1	13.7
1997	6.2	8.4	10.1	13.7
1998	6.2	8.4	10.1	13.7
1999	6.2	8.4	10.1	13.7
2000	6.2	8.4	10.1	13.7

TABLE 18. DIFFERENCES IN SCHOOL FACILITIES REQUIREMENTS (number of schools)

Year	EL	EM	DTM	DTH
1990	0	0	0	0
1991	0	0	0	0
1992	0	0	0	0
1993	0	1	1	2
1994	0	0	0	0
1995	0	0	0	0
1996	0	0	0	0
1997	0	0	1	1
1998	1	1	0	0
1999	0	0	1	1
2000	0	0	0	0

TABLE 19. CUMULATIVE CAPITAL COST REQUIREMENTS
PARK ACQUISITION AND SCHOOLS
(1990-2000)

(in millions of 1984 dollars)

	Base	EL	EM	DTM	DTH
TOTAL	284	271	259	247	234
DIFFERENCE		-13	-25	-37	-50

These differences in capital costs were incorporated into our estimate of net budget impact through assumptions regarding the proportion of these costs which would be general obligation bonded and the characteristics of those bond issues. In the case of schools, the impact was further mitigated by the assumption that 70 percent of the debt service incurred by the Anchorage School District would be funded by state revenues under the State Reimbursement for School Debt Service. If a larger proportion of capital expenditures were bonded, the net impact on the Municipal budget would be larger as debt service became more substantial. Likewise, if the level of school debt service reimbursed by the state were to decline over time with falling petroleum revenues, capital expenditures for school facilities would have a more substantial impact on total annual school district budget.

Debt Service Impacts

Even when the net fiscal impact is zero, there is the possibility of another type of impact. Fewer residents will have to share any fixed costs. This may mean that the public cost burden on each individual rises.

One example of this type of effect is debt service. As the analysis in Appendix B shows, few of the major capital improvements appear population sensitive within the range of population changes projected; this means that most of the spending for capital projects will be done whether the KAC is built or not. The debt service for these projects will be a fixed cost in the sense that it will be paid independent of the level of population.

Table 20 shows the debt service per capita in each of our scenarios. The greatest difference from the base case is a difference of $6 per person in 1995 in the Downtown high case. Debt service impact under our assumptions is not very significant. The effect depends on our assumptions. The larger the debt service, the greater will be the effect. The size of this effect depends on factors such as political decisions about capital spending and state support.

TABLE 20. DEBT SERVICE PER CAPITA
(1984 dollars)

	EL	EM	DTM	DTH	Base
1990	148	149	149	150	148
1995	162	162	163	165	159
2000	131	133	134	136	131

SOURCE: Fiscmod computer runs

Proposition 24

Voters recently approved a spending limitation in Anchorage. This adopted rule holds the increase in taxes collected from existing property to the rate of growth in population and prices. The effective tax rate on existing property can then be applied to new property. If we assume the rate of increase in the value of existing property is similar to the rate of growth in the CPI, then this rule effectively holds the increase in the property tax rate to the rate of growth of population.

In our projections, the effect of Proposition 24 in limiting spending was ignored. Comparison of projected expenditures with those allowed by the limit suggests little trouble with exceeding this ceiling. This is because we assume no increases in services or service standards, and we start from an already constrained budget (FY84).

We can examine the impact of the KAC on spending under Proposition 24 by looking at the projected spending limit under each scenario. We would expect the spending limit to be reduced if the KAC is built because the primary effect on Anchorage of the KAC will be to reduce Anchorage population. If we were spending to the limit, comparing the limit in each scenario shows how much Municipal spending would be cut back.

Table 21 compares the spending limit in each scenario. By the year 2000, the spending limit would be reduced by as much as $102 million dollars. This is over 20 percent of the 1984 limit (in 1984 dollars) and 8 percent of the year 2000 limit. These effects depend on assumptions about nontax revenues and their population sensitivity; the greater their share of nontax revenues and the less sensitive these sources are to population, the lower will be this effect.

TABLE 21. ALLOWABLE SPENDING UNDER PROPOSITION 24
SPENDING LIMIT

(millions of dollars)

	Base	EL	EM	DTM	DTH
1990	590.2	589.5	588.6	587.7	586.9
1995	871.4	861.2	853.4	845.4	831.4
2000	1250.4	1226.5	1208.7	1183.5	1148.82

Sensitivity Tests

The fiscal impacts presented above depend importantly on what we assume will determine the future pattern of Municipal revenues and expenditures. We have hypothesized above that fiscal impact depends on the relative sensitivity of revenues and expenditures to population. In this section, we examine the effect of varying our assumptions about the determinants of revenues and expenditures.

In this section, we examine four alternative sets of fiscal impact assumptions. We compare the effects of these assumptions under the Downtown Crossing-Mid-Density Scenario. The following assumptions describe our four alternative fiscal scenarios:

- Increased Suburban Effect. In this scenario, we assume that nonresidents have a greater impact on Municipal expenditures than in the base case. This has the effect of reducing the sensitivity of expenditures to changes in the level of resident population.

- Growth in State Revenues. In this scenario, we assume that state revenues do not decline in the future. This allows state transfers to the Municipality to remain constant in real per capita terms. This has the effect of increasing the population sensitivity of state revenues. The overall effect will depend on whether state revenues or taxes which they replace have a greater population sensitivity.

- No Fixed Costs. This scenario assumes that there is no fixed expenditures component to the Municipal budget; all expenditures are assumed to increase with population. This has the effect of making expenditures more population sensitive than in the base case.

- Limited Suburban Effect. This scenario assumes that in addition to there being no fixed expenditure component, nonresidents have only a limited impact on expenditures. This has the effect of increasing the population sensitivity of Municipal expenditures.

These alternative scenarios provide two cases in which the relative population sensitivity of revenues is increased compared to the base and two in which expenditures are made relatively more sensitive. According to our hypothesis, the fiscal impact will be more negative the greater the relative population sensitivity of revenues. The results shown in Table 22 support this hypothesis. The negative impacts are greater in those cases (2 and 3) in which revenues are made relatively more sensitive and smaller in those cases (4 and 5) in which expenditures are made more sensitive.

TABLE 22. NET FISCAL IMPACT
DOWNTOWN CROSSING-MID-DENSITY SCENARIO

(Change in Revenues-Change in Expenditures)
(millions of 1984 dollars)

	(1) Base	(2) Increase Suburban Effect	(3) Increase State Revenues	(4) No Fixed Costs	(5) Limited Suburban Effect
1990	.419	.316	-.057	.901	1.091
1995	-1.764	-2.521	-3.356	.429	1.186
2000	-5.718	-7.475	-7.57	-2.162	-1.107

SOURCE: Fiscmod computer runs

V. CONCLUSIONS

The construction of a crossing over the Knik Arm will generate major changes in a number of sectors. These changes will be differences from the way things would be without the crossing. These changes will generate both benefits and costs. Who receives these benefits and bears these costs is an important issue. This study has been an attempt to add information to the discussion of the effects of the Knik Arm Crossing.

From the state's perspective, the most important question concerns the net effect of the crossing. If the positive effects outweigh the negative ones, the project is a good one. Our study examined a portion of the distributional consequences of building the crossing. This study examined the impacts on the fiscal sector of the Municipality of Anchorage.

We found that, under a reasonable set of assumptions about the determinants of revenues and expenditures, the KAC will produce a negative fiscal impact on the Municipality. Although the impact was negative, the budget effect was modest. In no case was the present value of the net fiscal effect greater than 10 percent of the current budget.

The interpretation of these impacts is complicated by three factors. First, their small size increases the importance of our

assumptions. The sensitivity tests showed that under certain assumptions, the fiscal impact might be positive. Secondly, projections in the future are uncertain. Our results are true only if our assumptions hold. Finally, we examine a truncated future, looking only at the period through the year 2000. Effects after 2000 are ignored. Although the pattern projected is an increasing negative impact (see Table 15), the uncertainty past this period is tremendous. There is no guarantee that the pattern will continue.

Finally, the negative direct fiscal impacts must be considered with the potentially more important opportunity cost impact. State funds are an important source for Municipal capital expenditures, having accounted for as much as 74 percent of capital spending in the past (FY 84). State spending on the KAC may reduce funds available for Municipal capital expenditures, forcing either increased tax support or reduced services. This is made more realistic because of the size of the project: the KAC is currently projected to cost more than a half billion dollars to construct. If the money comes from bonds, this will limit the state's ability to bond other things. If the money comes from direct appropriation, it comes from a limited amount of state revenues. For example, if federal highway funds were used for approach roads, the Knik Arm project could exhaust the Anchorage fund allocation for several years. In either case, the importance of state funding for Municipal capital expenditures makes this opportunity cost impact important.

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APPENDIX A

FISCMOD

Variable Definitions

Parameters

E4 Rate of change in nonpopulation-sensitive part of the budget

OBC1 Per capita expenditure, resident only population sensitive

OBC2 Per capita expenditure, suburban and resident population sensitive

OBA84 Nonpopulation-sensitive budget in base year

RVA Fixed revenues in base year

RVB Revenues which are constant in real dollars

RVC Per capita revenues which are constant in per capita terms

RVD Per capita revenues which are constant in per capita terms and real dollars

INT Interest rate

T1, T2, T3 - Regression coefficients

V1-V6 Regression coefficients

SBA83 Nonpopulation-sensitive budget in base year

SC1 Per capita expenditure, population sensitive

SC2 Per facility expenditure, secondary

SC3 Per facility expenditure, primary

SRVA Fixed revenues in base year

SRVB Revenues constant in real dollars

SRVC Per capita revenues, constant in per capita terms

SRVD Per capita revenues, constant in per capita terms and real dollars

Endogenous

CPIM	Rate of change in CPI since 1984
SPOP	Anchorage plus effective units of KA run population
OB	Operating Budget
MB	Municipal budget
MNTREV	Municipal nontax revenues
MTX1	Municipal nonproperty tax (hotel, motel, and auto fees)
RRPVL	Real real property value (1983 dollars)
RPPVL	Real personal property value (1983 dollars)
PVAL	Property value
MPTXR	Municipal property tax rate
MTXRV	Municipal tax revenue
MTOTRV	Municipal total revenue
SOB	School operating budget
SB	School budget
SNTRV	School nontax revenue
SPTXR	School property tax rate
STXRV	School tax revenue
STOTRV	School total revenue
TLMT1	Tax increase limit (old property)
TAX	Total tax limit
MB24	Budget limit with P24
CNST24	Effect of limit

RMB	Real Municipal budget
RSB	Real school budget
RMRV	Real Municipal revenue
RSRV	Real school revenue
TB	Total budget (Municipal and school)
TRV	Total revenue
RTB	Real total budget
RTRV	Real total revenue
NET	Real revenue minus real budget
PVNET	Present value NET
PVNTPC	Present value NET per capita
DSPC	Per capita debt service
RDSPC	Real per capita debt service
PVRDS	Present value RDSPC

MODEL: FISCMOD

FISCMOD IS THE FISCAL MODEL OF ANCHORAGE DEVELOPED FOR THE KNIK ARM CROSSING FISCAL IMPACTS ANALYSIS. THE MODEL WAS CREATED IN MAY 1984.

SYMBOL DECLARATIONS

ENDOGENOUS:
CN24O MPTXR MTXAF MTXHM RPPVL RRPVL SPTXR TAX

DEFINITION:
CNST24 DSPC MB MB24 MNET MNTRV MTOTRV MTXRV MTX1 NET
NTPC OB PVAL RDSPC RMB RMRV RSB RSRV RTB RTRV SB
SNET SNTRV SOB SPOP STOTRV STXRV TB TLMT1 TRV

EXOGENOUS:
A.POPOFF CPIM DSB KA.POP OM PFC SDSB SFC SH1 SKID VST
YR

COEFFICIENT:
T1 T2 T3 T4 V1 V2 V3 V5 V6

PARAMETER:
E4 INT OBA84 OBC1 OBC2 RVA RVB RVC RVD SBA83 SC1 SC2
SC3 SRVA SRVB SRVC SRVD S1 S5

EQUATIONS

1: SPOP == A.POPOFF+SH1*KA.POP

2: OB == (OBA84*(1+E4)**(YR-1983)+OBC1*A.POPOFF+OBC2*SPOP)*CPIM+OM

3: MB == OB+DSB

4: MNTRV == RVA+RVB*CPIM+RVC*A.POPOFF+RVD*A.POPOFF*CPIM+INT*MB/2

5: MTXHM = (T1+T2*VST)*CPIM

6: MTXAF = (T3+T4*(A.POPOFF(-1)+18.2))/1000

7: MTX1 == MTXHM+MTXAF

8: RRPVL = V1+V2*(A.POPOFF(-1)-A.POPOFF(-2))+V3*(A.POPOFF(-2)-
A.POPOFF(-3))+RRPVL(-1)

9: RPPVL = V5+V6*(A.POPOFF(-1)+18.2)

```
10:  PVAL == (RRPVL+RPPVL)*CPIM

11:  MPTXR = (MB-MNTRV-MTX1)/PVAL

12:  MTXRV == MTX1+MPTXR*PVAL

13:  MTOTRV == MTXRV+MNTRV

14:  SOB == (SBA83*(1+S5)**(YR-1983)+SC1*SKID+SC2*SFC+SC3*PFC)*CPIM

15:  SB == SOB+SDSB*S1

16:  SNTRV == SRVA+SRVB*CPIM+SRVC*SKID+SRVD*SKID*CPIM+INT*SB/2

17:  SPTXR = (SB-SNTRV)/PVAL

18:  STXRV == SPTXR*PVAL

19:  STOTRV == SNTRV+STXRV

20:  TLMT1 == (TAX(-1)+CN240(-1))*((A.POPOFF(-1)/A.POPOFF(-2)+A.POPOFF
     (-2)/A.POPOFF(-3)+A.POPOFF(-3)/A.POPOFF(-4)+A.POPOFF(-4)/A.POPOFF
     (-5)+A.POPOFF(-5)/A.POPOFF(-6))/5)*CPIM/CPIM(-1)

21:  TAX = (TLMT1-MTX1)/(PVAL(-1)*CPIM/CPIM(-1))*(PVAL-PVAL(-1)*CPIM/
     CPIM(-1))+TLMT1

22:  MB24 == TAX+MNTRV+SNTRV+DSB+SDSB*S1

23:  CNST24 == MB+SB-MB24

24:  CN240 == IF CNST24 LE 0 THEN CNST24 ELSE 0

25:  RMB == MB/CPIM

26:  RSB == SB/CPIM

27:  RMRV == MTOTRV/CPIM

28:  RSRV == STOTRV/CPIM

29:  TB == MB+SB

30:  TRV == MTOTRV+STOTRV

31:  RTB == TB/CPIM

32:  RTRV == TRV/CPIM

33:  NET == RTRV-RTB
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```
34:  NTPC == (RTRV-RTB)/A.POPOFF

35:  DSPC == (DSB+SDSB)/A.POPOFF

36:  RDSPC == DSPC/CPIM

37:  MNET == RMRV-RMB

38:  SNET == RSRV-RSB
```

FISCMOD - COEFFICIENT AND PARAMETER VALUES

E4	0.	INT	0.08	OBA84	52.4
OBC1	0.0946	OBC2	0.3714	RVA	49.7
RVB	15.7	RVC	0.	RVD	0.112
SBA83	15.35	SC1	3.18	SC2	1.442
SC3	0.38	SRVA	0.	SRVB	4.59
SRVC	0.	SRVD	3.03	S1	0.3
S5	0.	T1	-0.817	T2	0.005
T3	-4761.8	T4	41.56	V1	-55.3
V2	27.2	V3	18.	V5	-431.3
V6	8.5				