Knik Arm Crossing
Planning Implementation Plan

Prepared for:

Knik Arm Bridge and Toll Authority
550 W. 7th Avenue, Suite 1850
Anchorage, AK 99501

Prepared by:

HDR Alaska, Inc.
2525 C Street, Suite 305
Anchorage, AK 99503

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Introduction

The Knik Arm Crossing (KAC) will provide improved access to readily developable land in the Mat-Su Borough (MSB). The change in accessibility will affect land markets in both the Municipality of Anchorage (MOA) and the MSB, which in turn would affect a change in the distribution of land uses for things like housing and employment. How big these changes are and where they are anticipated to occur will drive other analyses and decisions pertinent to the Environmental Impact Statement (EIS), including:

- Future demographic and economic inputs to forecast future traffic.
- Documentation of conditions (existing and future) that could support the purpose and need for the project.
- Refinement of the project termini and area of influence.
- Indirect and cumulative impact analysis to land uses, existing plans, local government services etc.
- Direct traffic impacts to existing and planned road networks.
- Air quality and noise analysis.
- Economic effects and user benefits.

The purpose of this implementation plan is to describe the methodology and approach to producing the information and analysis to show how demographics, economics, land use, and transportation will change as a result of the project and how that information will be used to document the direct and indirect implications of those changes.

Study Area

The potentially affected area for the planning analysis would encompass the Municipality of Anchorage (MOA) and the Matanuska-Susitna Borough (MSB), which includes the incorporated cities of Palmer, Wasilla, and Houston. This broad area is anticipated to encompass the area which could experience reduced growth rates for future housing and employment as a result of the project.

A smaller, sub-area on the Mat-Su side of the crossing is anticipated to experience increased growth and development with a bridge. This smaller area includes the area from Point MacKenzie/Port MacKenzie to approximately the Parks Highway and includes the Big Lake and the Knik-Fairview areas. These areas are anticipated to be the focus of the indirect effects analysis evaluating induced growth.

On the Anchorage side of the crossing, the Government Hill neighborhood, downtown Anchorage, the Ship Creek industrial area, the Port of Anchorage, and Elmendorf Air Force Base are areas likely to see changes in traffic levels and potential effects of that traffic on air quality and noise levels. In part, the proposed analysis will be used to refine this study area to identify (1) logical termini and (2) the area of influence of the project.

Methodology

The proposed methodology is based on techniques identified in "Land Use Impacts of Transportation: A Guidebook" which was prepared for the National Cooperative Highway Research Program (Transportation Research Board, 1998). The guidebook identifies tools that can be used to determine what influence a transportation project will have on land use. This project will make extensive use of

four of those tools: qualitative methods, Geographical Information Systems (GIS), land use models, and regional economic models.

Qualitative Methods. According to the guidebook, qualitative methods, including interviews, Deplhi, surveys, and expert analysis, can provide an effective means of:

- gathering and analyzing information from local experts, their choices, and their motivations;
- estimating future land use locational choices based on an understanding of development processes in the region;
- understanding existing conditions;
- establishing policy assumptions;
- providing insight on population and employment growth;
- gauging local land market and growth patterns to assign households and jobs to zones.

Geographic Information Systems. A second tool to be used is a Geographic Information System (GIS). GIS "provides the ability to map, display, and analyze all manner of data with a spatial component" and is "a powerful tool for the spatial analysis of land use and transportation system interactions" (Transportation Research Board, 1998:45). GIS provides a way to "analyze and map the relationships between land supply, constraints and opportunities for development, and choices of households and firms" (Transportation Research Board, 1998:8). GIS will be used in this analysis to help understand existing conditions, inventory and assess developable land, and assign households to zones, and display the results.

Land Use Allocation Models. A land use allocation model, is a computer program or series of algorithms that simulate the growth or change in land markets given a variety of input factors. Anchorage's land use allocation model, which is the formal tool for identifying the future allocation of households and employment in Anchorage for traffic modeling purposes, will be used to assess the potential changes to Anchorage's development patterns with construction of the bridge.

Regional Economic Models. Regional economic models are used to simulate the economy to estimate the impacts of major economic changes or assumptions, such as population growth, economic expansion or contraction, and other factors. The project team will be using a statewide model that has regional forecasting capabilities developed by ISER, the Institute of Social and Economic Research at the University of Alaska.

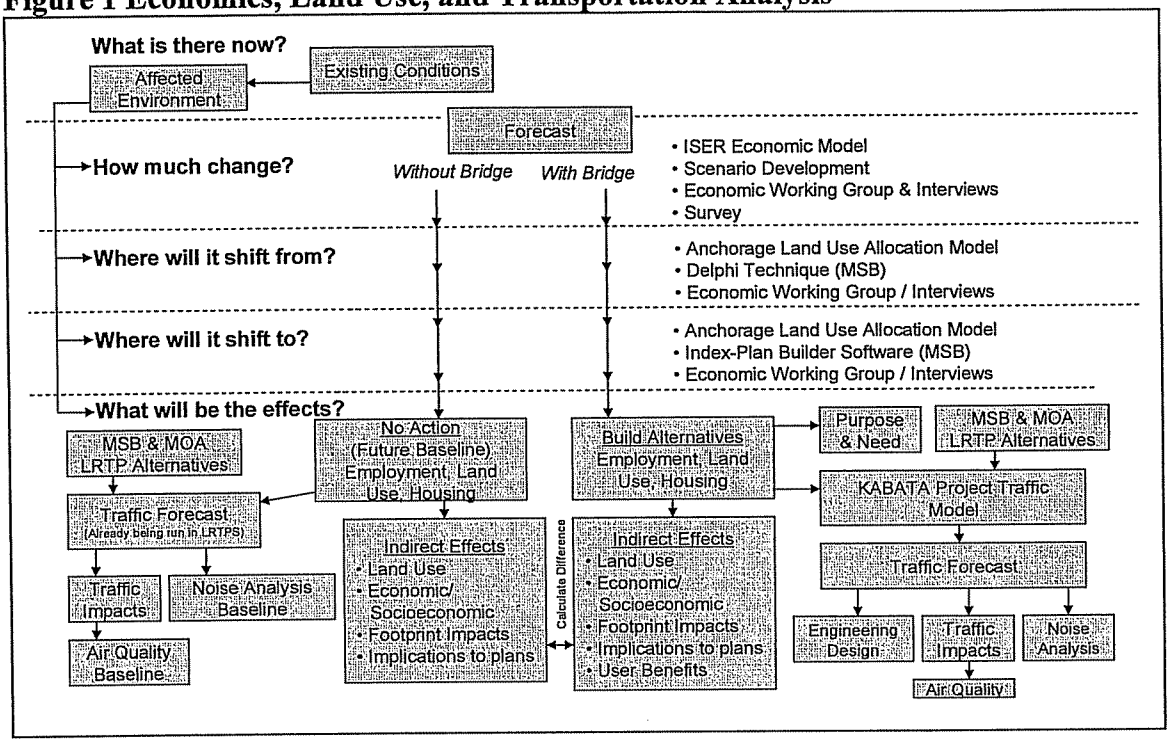
How these techniques will be used for the Knik Arm Crossing project will be discussed in more detail below.

There are five key questions which will be answered to generate the information and analysis that will be required for the EIS. These elements are:

- What is there now?
- How much will change?
- Where will growth shift from?
- Where will growth shift to?
- What will be the effects?

The following flow chart outlines the process for developing answers to these five questions.

Figure 1 Economics, Land Use, and Transportation Analysis



Existing Conditions - What is there now?

Having good baseline data on the environment that could be affected by the project will be critical to the remaining analysis and is a required component of the EIS. Most directly, the baseline conditions will be documented as part of the "existing conditions" chapter of the EIS. The objective of this effort is to describe the environment of the area affected by the proposed action and alternatives. The Affected Environment section would establish the context in which the proposed action must be evaluated (40 C.F.R. 1502.15); and would contain data and analysis that are commensurate in detail with the importance of the impacts.

Existing economic, demographic, land use, and transportation hubs in the region will be documented using information already developed in previous efforts. Available project area documentation includes the 1984 DEIS, various reports and area-wide plans from DOT&PF, 2004 KABATA transition report and appendices, as well as reports generated by the MOA and MSB. Information will be summarized to provide appropriate baseline context for evaluating the potential impacts of project alternatives. Input from scoping, interested agencies, and other preliminary review materials will be utilized to define the appropriate level of information to be included in the Affected Environment section.

The existing conditions that are most pertinent to future growth, land development, and transportation will be described accordingly, including:

- Demographics and socioeconomics
- Transportation systems and usage
- Existing land use and ownership
- Administrative and regulatory controls over development
- Physical and environmental constraints to development
- Planning documents and other guidance on future development
- Fiscal conditions and public services information
- Employment and income data

- Economic and business activity.

Forecast the Future – How much change?

Once a solid baseline has been established, the team will begin the process of assessing what the future will look like with and without the crossing. This first step will be to estimate the overall amount of change anticipated to occur. How much overall growth is forecast for the region? Will that growth projection change, if access to large tracts of developable land are opened up minutes from downtown Anchorage? Answers to these questions will establish our forecast of future population and employment (the primary drivers in predicting future land use needs and resultant traffic demand). It should be noted that both the MSB and MOA are currently in the process of updating their respective Long Range Transportation Plans. In doing so, each jurisdiction already has (or will have shortly) a future forecast of housing and employment, its allocation, and resultant traffic generation without the KAC – i.e. the no-build condition.

The approach engages the a "panel of experts" (i.e. an economic working group of planners, developers, real estate agents, demographers, and economists) to assess existing conditions information and provide input on the major economic drivers anticipated to affect the future, and to convert that information into assumptions for use in an econom forecasting model developed by ISER at the University of Alaska Anchorage.

The following tasks will be undertaken to estimate the level of future change:

1. Create an Economic Working Group (EWG). Establish an economic working group of qualified individuals to sit on an advisory panel that will provide input to the consultant team and KABATA on economic and land use assumptions. Members will include planners and demographers from the Municipality of Anchorage (MOA), the Matanuska-Susitna Borough (MSB), and the Alaska Department of Transportation and Public Facilities(DOT&PF). In addition, private sector developers, real estate agents, and economists will be invited to participate.

2. Conduct Interviews with Other Stakeholders. Concurrent with the creation of the economic working group, a series of interviews will be conducted with other organizations and agencies that may have substantive input into discussions about the economic future and development of the State and Southcentral Alaska in particular. The Port of Anchorage, Port MacKenzie, and Ted Stevens Anchorage International Airport are among the organizations that will be contacted.

3. **Conduct a survey of MOA and MSB Households** to determine housing and location preferences. While the ISER model will provide a forecast of future population overall a critical question is where those people will reside given the accessibility changes provided by the KAC. What are the housing market factors that will affect where someone will choose to live in the future? How might the availability of land closer to Anchorage, shorter commute times, and changing costs of travel and housing change those decisions? What are the demographics of the population likely to move across the Knik Arm if the project were to be developed? This survey will address these questions and will commence early in the process. The results will be used to help round out the scenarios, provide useful demographic data for the travel demand model, and for forecasting future growth and housing shifts.

4. **Develop Scenarios.** A series of meetings will be held with the EWG to develop assumptions for the low, mid, and high scenarios to be employed in the ISER model. The information from the interviews and the survey will be important data for the EWG in developing the scenarios. The scenario development will provide data input to ISER's model, but will also form the basis for future land use development in the MSB, a key component forming the basis for the indirect effects analysis.

5. Run ISER Model. The ISER model will provide annual forecasts through 2030 on population, households, employment, and personal income for the MOA and the MSB with and without the KAC. These outputs will be inputs to the land use allocation models and the traffic forecast model, and form the foundation for the subsequent analysis of land use and socioeconomic effects.

The results through this phase of analysis will predict how much growth we can expect in Anchorage and the Mat-su Borough with and without the project. Where that growth will occur, and how its distribution will change with the project will be discussed next.

Where will growth shift from?

Improved accessibility to developable land will change the desirability of property in the MSB across Knik Arm. The shorter commute time there, as compared to other areas of the MSB, will cause growth to slow in those areas with longer commute times. The availability of cheaper land or larger lot sizes in close proximity to Anchorage will affect growth patterns in Anchorage as well. This section describes the approach that will be used to estimate which areas will be experiencing slower population and employment growth rates as a result on the Knick Arm Crossing. In other words, as the Port MacKenzie area grows with bridge construction, where would that growth have occurred had there been no bridge.

Due to the availability of different analysis tools and data in the two jurisdictions, different methods will be used to estimate growth changes in each. These two approaches are discussed below.

Land Use Allocation Model. In Anchorage, the approach to determining how Anchorage's growth patterns will change relies on the use of Anchorage's Land Use Allocation Model. "The land use allocation model (using a Microsoft Excel spreadsheet platform) projects the density and distribution of future population, households, and employment by sector (retail, professional services, health, education, other services, and industrial). Output from the land use allocation model is used as the primary input for the FHWA approved transportation demand model. The land use allocation model uses a two phase process to step down the regional growth projections developed by the Institute of Social and Economic Research (ISER) to the Traffic Analysis Zone estimates usable by the transportation demand model" (MOA, 2002).

2. Delphi Technique. The MSB does not currently use a land use allocation model. To determine where the population will shift from, the Delphi technique will be used in conjunction with the EWG. The Delphi technique is an intuitive/iterative forecasting technique that relies on a group of experts to develop an initial estimate. The estimate is then refined by the group members until a reasonable consensus occurs. For more details about Delphi, please see Section 2.2 of *Land Use Impacts of Transportation: A Guidebook.*

3. Economic Working Group/Interviews. The economic working group analysis will be supplemented with interviews of other knowledgeable stakeholders to refine and review the results.

Where will the growth shift to?

This section describes the approach that will be used to estimate which areas will be experiencing increased population and employment growth rates as a result on the Knick Arm Crossing. In Anchorage, the approach relies on the Land Use Allocation Model discussed earlier. In the MSB, a software package called Index PlanBuilder will be used in conjunction with GIS analysis, and input from the EWG.

1. Anchorage. The previously discussed Land Use Allocation Model will be used to identify if any area would be predicted to see an increase in growth with development of the bridge.

2. MSB. Predicting where growth will occur in the MSB will be a two step process. The MSB has not implemented zoning over the area likely to develop with the bridge. To try to gauge where development is likely to occur, a development constraint approach will be employed. The first step involves developing a constraints map which will be used to identify areas which are physically constrained (e.g. steep topography), environmentally constrained (e.g. sensitive wetlands), ownership constrained (e.g. public parks and refuges), or those areas facing regulatory constraint (e.g. the agricultural reserve lands). To identify the constrained areas, a modern version of an overlay process introduced in the 1960s by Ian McHarg, a well-known landscape architect, will be used. McHarg developed the overlay process to better consider the environment at the planning stage. It entails mapping environmental resources separately and then combining them in a layered format to develop a better understanding of the environmental opportunities and constraints of an area.

The process starts with the identification of the factors to be considered. Potential factors to be included are:

- Wetlands
- Elevation/Slope
- Gravel Sub Surface
- Water Bodies
- Land Ownership

For each factor, a GIS layer will be developed with ratings/gradations representing areas with the greatest value (or greatest constraint) and the lightest gradations representing the areas with the lowest values (or least constraint). The layers will be superimposed on each other to form a composite map. The darkest areas will identify the areas with the greatest overall constraints, and the lightest with the least.

Using the constraints map as a base, the future development scenarios will be built and placed into the study area using PlanBuilder software. Index PlanBuilder is a GIS-based tool designed to facilitate scenario development and evaluation of those scenarios by providing indices to assess the scenarios. Plan Builder has been used on other project including Envision Utah and Atlanta Mobility 2030. PlanBuilder will be used in conjunction with the MSB representation on the EWG to help identify likely future locations for growth and the density of that growth. The kinds of indicators that can be assessed include:

- Population density
- Student Enrollment Levels
- Open Space Connectivity
- Residential Water Consumption
- Employment Density
- Park Space Supply.

A full list of indices available as outputs of the planbuilder software is available in attachment A.

3. Economic Working Group/Interviews. MSB representatives of the economic working group will provide input to refine the scenarios and review measures generated by the software.

What will be the effects?

The work done up to this point will have laid the groundwork for the primary objective of NEPA—the identification and evaluation of potential positive and adverse impacts of the project. The CEQ NEPA Regulations require the environmental consequences section of an EIS to discuss both direct and indirect environmental effects and their significance.

The analysis completed in this phase will provide the information for the Environmental Consequences (EQ) section of the EIS document, particularly those topics in the EIS that deal with the human environment. The objective of this effort is to explore and objectively evaluate the effects of all reasonable project alternatives. A good faith effort will be made to disclose the environmental consequences of the alternatives.

Direct Effects are caused by the alternatives and occur at the same time and place as the action. A list of potential direct effects such as construction-period economic impacts, loss of housing as a result of right of way acquisition, effects on port revenues, will be developed. The analysis of direct effects will be based on generally accepted qualitative and quantitative tools, including commonly used planning and economic models for economic impact assessments.

Indirect Effects are reasonably foreseeable effects caused by the proposed action or alternatives, but occur later in time or are further removed from the project site than direct effects. As indicated in the *Preliminary Indirect and Cumulative Impact Assessment Technical Memorandum*, the key to the successful indirect effects analysis for this kind of transportation project is characterizing the future growth scenario(s) for the region relative to the project alternatives and determining the amount of traffic that would be accommodated.

The scenarios built to forecast growth will largely represent the indirect changes to land use and demographics anticipated with the project. The effects of the project will be based on the future anticipated differences between the build and no-build conditions. Demographic, employment, and land use (as developed through the ISER Model, the EWG, and land use allocation model) will be compared to the no build (as developed within each of the respective LRTPs) to identify changes with and without the project. To the effect that these changes are in line with KABATA's mission or support the purpose and need for the project they would be considered benefits.

Those benefits might also come at a cost to the environment, which would also be documented. The results of the scenario development and PlanBuilder software measures will be summarized to identify anticipated effects to demographics, land use, housing, employment, environmental factors, and travel indices.

Demographic and land use assumptions developed in the scenarios will be input into the KABATA project traffic model. A traffic model assists in predicting changes in traffic patterns and how the transportation system reacts to changes in development, population, etc. The KABATA regional traffic model was created by merging the MOA and MSB traffic models using TransCAD and is the first and only model able to evaluate traffic on a regional basis between the MSB and MOA. The model will be used to generate travel forecasts that will support the engineering effort in bridge design and for the approaches to the bridge. The traffic forecast will also be used to identify future traffic impacts, to gauge regional air quality conformity, and to feed microscale (hot spot) air quality analysis. Because the project traffic model is built using the two FHWA approved travel models for the respective jurisdictions, it should suffice for generating acceptable traffic forecasts and for air quality analysis. Noise analysis will also be developed based on travel forecasts generated by the project model.

The socioeconomic effects of the alternatives will be evaluated using the low, medium, and high economic growth scenarios developed by the economic working group. The effects would consider potential changes on the affected environment including the following:

1) Economic activity (employment, business activity, military)
2) Income
3) Land and housing supply and demand; and prices
4) Transportation (ports, airport, and ferry)

5) Fiscal effects
6) Effects on Public services
7) Land use changes
8) Changes to community character
9) Recreational resources
10) Subsistence activities
11) Social Values

Both quantitative and qualitative approaches would be utilized for this task. A spreadsheet model similar to the analysis provided for the Gravina Bridge would be developed. This model would be an integrated model that would incorporate economic, land use, and traffic models.

In addition, a user benefits model would be developed to "evaluate how a Knik Arm crossing may benefit the regional economically." The user benefits model will quantify project benefits such as travel time savings, vehicle operating cost savings, reduced accidents, etc.

References

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