

PROJECT REPORT

ALASKA IWAYS ARCHITECTURE
FEDERAL #ITS-9802(1)



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Project Location: Alaska

FY01 ITS Earmark \$425,000 (50/30/20)

Total:

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OVERVIEW

The Alaska Department of Transportation and Public Facilities (ADOT&PF) is continually looking at ways to improve the efficiency, safety, and reliability of Alaska's transportation system. This effort includes the application of advanced communications, control, and information processing technologies including computer hardware and software at locations throughout the state. When used together, technologies like these forms what is commonly referred to as an Intelligent Transportation System (ITS). To ensure that these relatively expensive technologies are implemented in an effective, coordinated, and cost-effective fashion the ADOT&PF through its consultant PB Farradyne developed the Alaska Iways Architecture. Iways is the state adopted label for ITS that stands for intelligence, integration, internet and information (the "I") for air, sea, and roadways (the "ways").

The following six documents or chapters comprise the Alaska Iways Architecture:

- Chapter 1: User Needs
- Chapter 2: User Services
- Chapter 3: ITS Long-Range Vision
- Chapter 4: Concept of Operations
- Chapter 5: Physical ITS Architecture
- Chapter 6: Implementation Plan

Each chapter listed above correlates to one of the six main phases that were undertaken to develop Alaska's Iways Architecture. Development of Alaska's Iways Architecture began with the identification of transportation user needs and concluded with Chapter 6-Implementation Plan.

The first and perhaps the most important step in the Alaska Iways Architecture development process was the identification of transportation user needs. This is due to the fact that transportation user needs acts as the foundation that supports all other activities undertaken as part of the Alaska Iways Architecture development effort. In other words, development of Chapters 2-6 of the Alaska Iways Architecture depends on the transportation user needs identified and documented in Chapter 1.

ADOT&PF is soliciting proposals for services to update the Alaska Iways Architecture in 2005. This update will include additional ITS elements, conversion to the National ITS Architecture version 5.0, conversion to Turbo Architecture and sample systems engineering analysis reports for ITS project managers to use.

PB Farradyne developed the Municipality of Anchorage (MOA) Regional ITS Architecture concurrently with the development of the Alaska Iways Architecture. PB Farradyne used similar project management plans to develop both architectures.

ALASKA IWAYS ARCHITECTURE PROJECT TIMELINE

ITS Earmark Secured	June 1999
Request for Proposal	September 1999
Vendor Selected (PB Farradyne).....	October 1999
Kickoff Meetings & Outreach	February 2000
Stakeholder Interviews Begin.....	March 2000
User Needs.....	April 2000
User Services.....	May 2000
Long Range Vision	June 2000
Concept of Operations.....	November 2000
Physical Architecture	December 2000
Implementation Plan	May 2002
Homeland Security Workshop.....	October 2002
Technical Appendices	April 2003
Final Report	December 2003
Architecture Update	January 2006

ANCHORAGE REGIONAL ITS ARCHITECTURE PROJECT TIMELINE

MOA Scoping Meeting	February 2001
Kickoff Meeting & Outreach	April 2001
Stakeholder Interviews Begin.....	April 2001
User Needs.....	December 2001
User Services.....	February 2002
Long Range Vision	February 2002
Concept of Operations.....	May 2002
Physical Architecture	December 2002
Implementation Plan	May 2003
Final Report	December 2003
Architecture Update	January 2006

LESSONS LEARNED

Institutional

Internal

The majority of internal issues that caused project development delays relate to getting feedback on the draft documents, changes in user needs as the project develops, and ITS reservations from personnel and the ITS Policy Committee. Once PB Farradyne completed drafts of each chapter, they were sent to ADOT&PF for review and comment. This process was lengthy and time consuming in trying to get personnel to review and comment. This may be due to various reasons. ITS was still a very new concept from 2000-2002 when most of the documents were circulated. Reviewing documents with ITS verbiage and physical architecture diagrams was not straightforward for readers who were unfamiliar with ITS. Delay in response was also due to lack of personnel taking the time to review lengthy documents. These reports were lengthy and time consuming for ADOT&PF personnel to read and review, sometimes taking months for a response.

Another internal issue is that user needs changed drastically when the September 11, 2001 terrorist attack in New York occurred. This caused ADOT&PF to reexamine its homeland security needs in regards to ITS. ADOT&PF requested that PB Farradyne add a technical appendix to the Alaska Iways Architecture. To generate the user needs, PB Farradyne initiated a Homeland Security Workshop in October 2002. The needs identified at this meeting were used to create a Homeland Security technical appendix. The purpose of the technical appendix is to acknowledge identified threats to Alaska transportation and other infrastructure elements, document the range of possible solutions identified at the workshop, and map these solutions to existing and planned ITS systems as identified in the Alaska Iways Architecture.

Other internal issues included personnel that held reservations in regards to ITS in general. Some personnel were reluctant to participate in ITS activities due to reservations about the concept of ITS. In some cases this reluctance was based on personnel that were unaware or misinformed about ITS. In other cases, personnel simply did not agree with the new ITS federal rules and policies. Through discussions with various personnel, many felt that the Federal Highway Administration (FHWA) was introducing and pushing new technologies that were too advanced and had not been proven in the field yet. In addition, along with the new ITS concept came a whole new set of deployment rules and policies that required more work and training, such as the systems engineering analysis, ITS Standards, National ITS Architecture, etc. For example, securing ITS Earmarks requires an in-depth application process that can be 30 pages or more to secure the funding.

Other internal issues arose from ADOT&PF initiating ITS from their Headquarters office. This generated some reservations about ITS from the Regional offices. From discussions, some personnel felt that Headquarters was initiating ITS projects and not including the regions. Regional personnel were concerned that their needs were not being addressed, only those high priority needs coming from Headquarters were. These bad feelings, in addition to many misunderstandings about ITS and the direction Headquarters was taking, made it more difficult to gain ITS support from the Regional offices.

Within the last few months, the Regions have begun to accept and support ITS. This is mainly due to clearing up misunderstandings and misconceptions through meetings and discussions and explaining the FHWA ITS Final Rule deadline of April 8th, 2005. The Final Rule deadline encourages ADOT&PF personnel to get involved because FHWA has threatened to suspend funding unless certain guidelines are not followed when deploying ITS. Acceptance is also due to ITS funding availability for the Regions to deploy ITS. The Regions were under the misunderstanding that only Headquarters was deploying ITS and funding was not readily available to them. Last, acceptance is due to the success of several ITS deployments such as the Road Weather Information Systems, 511 Travel Information Number, Maintenance Management System, and more. Once ADOT&PF personnel could see the technology and the benefits, it generated positive interest and requests for additional projects.

Other internal issues arose from having an ITS Policy Committee. During the architecture development, ADOT&PF formed an ITS Policy Committee made up of upper level management to oversee project prioritization and funding allocation. Midway through the architecture development the ITS Policy Committee requested a reevaluation of architecture direction. This delayed the architecture development because of the drastic changes and rewrites requested by the ITS Policy Committee.

Lessons Learned – Internal:

- Provide continuous ITS overviews and training before and after architecture development. This can help alleviate many misunderstandings and reluctant feelings and can help generate support. This can also help alleviate delays in architecture development.
- Be patient. ITS is new and advanced technologies that raise reservations about the need and reliability of the hardware. It takes time to accept new programs and requirements.
- Support the Regions –Ensure Regional personnel that ITS funding is available to deploy and maintain ITS elements. Involve the Regions as much as possible. The Alaska Iways Architecture update in 2005 will include a main contact from each Region to ensure regional representation.

Institutional

External

Very few external institutional issues arose. The contractor conducted interviews with agencies outside of ADOT&PF and most were very supportive and willing to participate. The main issue in working with other agencies, was the lack of ITS knowledge. All potential stakeholders that participated in the interviews were invited to ITS meetings and presentations to generate support. However, not enough has been provided. More training is needed to generate their support on ITS projects.

Lessons Learned-External:

- Provide continuous ITS overviews and training to potential stakeholders outside the ADOT&PF before and after architecture development. This can help

generate support and interest in ITS. This can also help alleviate delays in architecture development.

Financial

The cost of developing the Alaska Iways Architecture was approximately \$500,000. ADOT&PF contracted this project concurrently with RWIS Phase I project management. The original cost was \$425,000 but changes requested by ADOT&PF personnel throughout the development added to the costs. In particular, the Homeland Security addition added significant costs.

Lessons Learned-Financial

- Create a budget that is adequate enough to take into consideration major changes or additions to the project. This is especially true when dealing with a new program.

Procurement

The ADOT&PF used a cost plus fixed fee procurement method. The contractor for the architecture development negotiated a fixed fee for project tasks at the inception of the contract. In addition to the fixed fee, the ADOT&PF reimbursed costs for travel expenses and changes in the scope of work.

The ADOT&PF selected a contractor based on qualifications and cost. The ADOT&PF scored proposals using a ranking system for each criteria: Objectives and Services, Methods, Management, Proposed Project Staff, Quality of Proposal, and Disadvantaged Business Enterprise. This method allowed ADOT&PF to choose a contractor based on qualifications, rather than just cost alone.

Lessons Learned - Procurement

- Use procurement methods that take into consideration unknown project tasks. This method helps keep the procurement methods flexible when there are unknowns and additional costs that arise during development.
- Use selection methods that take into consideration both expertise and cost. Low-bid is not always the best solution for ITS projects since they don't take into consideration expertise and knowledge.

ARCHITECTURE UPDATE

The ADOT&PF is soliciting proposals for services to update and revise the Alaska Iways Architecture. The contracted services will encompass the following:

- Identifying the user needs through stakeholder interviews and updating Chapters 1-6 to reflect those needs. ADOT&PF decided to include ITS elements that were not previously considered, such as traffic signals and counters, and work zone safety technology.
- Ensure that the updated Alaska Iways Architecture conforms to the latest version of the National ITS Architecture. The Alaska Iways Architecture is based on version 3.0.
- Convert the Alaska Iways Architecture to Turbo Architecture.
- Create a systems engineering analysis example for ITS project managers to use as a guide when completing the Systems Engineering Analysis requirements as outlined in Title 23, Code of Federal Regulations, Part 940.

ADOT&PF will complete and upgrade every 2-3 years or as often as necessary to ensure that all ITS projects are included. The Alaska Iways Architecture is a dynamic document that ADOT&PF will continue to upgrade as needs and technology change.