PARSONS BRINCKERHOFF

Memorandum

To: Lisa Idell-Sassi, Alaska DOT&PF

From: Les Jacobson, PB

Date: July 29, 2015

Subject: **Alaska Iways Architecture Review and Recommendations**

This memo outlines key aspects of the approach to updating the Alaska Iways Architecture (AKIA) and related documentation. There will be a formal work plan and more detailed recommendations developed after the interviews are completed.

Documents Reviewed

The following were reviewed in development of these recommendations:

1. Iways Architecture Maintenance Process Technical Memo, January 5, 2009.
2. Alaska Iways Architecture Change Request Form, January 5, 2009
3. Alaska Iways Architecture Systems Engineering Checklist and Instructions, December, 2008
4. Alaska Iways Architecture Update Summary Report, January 26, 2009
5. Alaska Iways Architecture Update User Needs, September 5, 2008
6. Alaska Iways Architecture Update User Services, September 5, 2008
7. Alaska Iways Architecture Update Long Range Vision, September 5, 2008
8. Alaska Iways Architecture Update Operational Concept, September 5, 2008
9. Alaska Iways Architecture Update Physical ITS Architecture, September 5, 2008
10. Alaska Iways Architecture Update Implementation Plan, March 10, 2009
11. Standards Technical Appendix, February 27, 2009
12. Alaska Iways ITS Architecture, 2009 Update Turbo Architecture files
13. USDOT, National ITS Architecture Version 7.0 (accessed at http://www.iteris.com/itsarch/index.htm)

14. Turbo Architecture Version 7.0 (accessed at http://www.iteris.com/itsarch/html/turbo/turbomain.htm)

Project Recommendations

The current AKIA is a comprehensive documentation of Alaska's planned and potential future ITS systems, as of the 2009 update. Our overall approach is to leverage the information in the AKIA documents and the information in the AKIA Turbo Architecture database to provide an updated and streamlined architecture and architecture documents that are easy to understand and easy to use.

Since the 2009 update was completed, there have been many factors that influence the suggested recommendations to updating the AKIA.

- Six years have passed since the AKIA documentation was completed. The technical work of developing the architecture was completed more than 6 years ago
- Updated National ITS Architecture and Turbo Architecture Tool. Technology has advanced, and the National ITS Architecture version 7.0 includes new and revised service packages, and the AKIA stakeholders may wish to consider these new service packages in their planning.

A key goal of the update is to provide an ITS Architecture that is highly accessible, such that it is understandable, usable, and more readily updated, as compared to the current documentation. This includes presenting the ITS architecture in a single view – the service package view – in the documentation. However, there are many service packages within the AKIA. We propose to tailor and combine these service packages to make the architecture easier to see and understand. We recommend combining service packages that provide a single "service", such as public transportation, rather than having 10 or 12 service packages that make up the public transportation service area.

Given these factors, we propose that a new single primary architecture document be developed for this update, leveraging the information in the 2009 update, and incorporating input from key stakeholders obtained through interviews to be conducted in early 2015 as part of the update process. We recommend a single document organized similarly to the Anchorage Regional Architecture document.

Maintenance Process

We have reviewed the Iways Architecture Maintenance Process Technical Memo and offer the following recommendations:

- The overall process described in the memo is still valid.

- Most of the sections of the memo are still valid. We recommend that the Maintenance Process Technical Memo be updated last. We believe the document and its individual sections can be appended to modify the process after the architecture is updated and a final decision on the maintenance process is made.

- We recommend reducing the number of reasons to update/revise the architecture provided in the maintenance technical memo:

    - Changes in needs, including advancements in technology that modify needs. Incorporate a discussion of institutional frameworks.

    - Significant changes in projects. The current maintenance process memo includes too many separate reasons that all revolve around project changes. We recommend providing a single reason that deals with changes in projects that provides guidance on how to determine if the changes are significant enough to result in a change to the architecture.

    - We recommend removing the requirement to change the Iways Architecture because of a change to National Architecture. Rather, if a change is needed for other reasons, then update to the latest version of the National Architecture.

- The steps needed to update the architecture are still valid, with some rewording to reflect other changes in the process.

- We recommend adding more explanation on modifying the Turbo files. There is not enough information to make changes and this lack of specificity may inhibit revisions that would be easy to make because there is not enough information on how to make them.

- We recommend adding information on how to update the website and how to archive past architectures. A notification process should also be developed so stakeholders know when the architecture is updated and what changes were made.

AKIA Updates

The biggest change in the architecture will be tailoring and combining service packages. The exact combination and tailoring will be determined in consultation with stakeholders. We recommend that we develop a proposed architecture after completing the stakeholder interviews. We would then hold a webinar on the proposed structure, walking through the proposed service areas and how they compare to the existing AKIA market packages and program areas.

After the architecture structure is agreed upon, the next step would be to combine the architecture documents (the equivalent of Chapters 1 through 5 in the current architecture documentation, plus the Standards appendix) into a single document. We strongly recommend simplifying the

documentation in order to make the architecture easier to use and to make the update process more streamlined. This will likely negate the need for a summary report.

We also recommend discussion of the implementation plan and its purpose.

Finally, the architecture change request form and the system engineering checklist should be discussed after the architecture is updated to determine if any changes are needed to either document.

Work Plan

This section will describe the tasks needed to implement the recommendations discussed above. A high level schedule and level of effort is also included.

Task 1: Project Management

This task provides funding to continue project management activities, as required in the contract, to continue through the Task 3 work items. The on-going Project Management activities include:

- Conducting Bi-Weekly Teleconferences
- Posting and storing project documents on the project website
- Maintain project schedule
- Submit monthly invoices and progress reports

Task 3.1: Architecture Update

This is the work of updating the Turbo Architecture database. In the update, the team will tailor the architecture to DOT&PF and develop service areas that combine some of the service packages in the National Architecture. The approach would include developing the architecture in the same Turbo database file as the Anchorage architecture to make development efficient and to maximize the benefits to users. Based on the stakeholder interviews, the initial architecture update would include 7 service areas

1. **Traffic Management** (including network detection and surveillance, traffic signal systems, DMS, CCTV monitoring, animal detection systems, workzone ITS, and TOC functions).
2. **Winter Maintenance** (including avalanche detection systems)
3. **CVO and Freight** (including rail, air, and port)
4. **Public Transportation** (including Alaska Marine Highways). This service area would also include the passenger side of ARRC and the connection to landside airport passenger information.
5. **Incident and Emergency Management**. This service area includes incident scene ITS that will improve safety of responders as well as the traveling public.
6. **Traveler Information**

7. **Data Archive**

The initial structure of the architecture will be presented to stakeholders during one to three webinars. The webinars will be structured very similarly to an architecture workshop. The team will provide a brief overview of the project and ITS architectures. The overview will also include a description of the existing architecture. In the second part of the webinar, the team will present the proposed structure of the architectures and the make-up of the service areas. The team will solicit input from webinar participants to be used to revise the architecture as needed. In the final portion of the webinar, the team will facilitate a final discussion to receive any last comments on the architecture and then present the next steps for the project. Because it is more difficult to keep participants focused for several hours on a webinar, it may be beneficial to cover a high level description of the proposed architecture and then 2 or 3 service areas in the second part of the webinar. The service areas could be grouped to include similar topics. A potential combination of service areas for the webinars is presented below:

- Webinar #1 – Traffic Management and Incident & Emergency Management
- Webinar #2 – Winter Maintenance and CVO & Freight
- Webinar #3 – Public Transportation, Traveler Information, and Data Archive

Invitations will be targeted to stakeholders who have involvement in the service areas covered by each individual webinar. There are some stakeholders, particularly those involved in planning, design, and safety, who may have interest in service areas covered by multiple webinars. The PB team will send targeted invitations to those stakeholders for all webinars in which they will have an interest. In addition, information on all the webinars will be sent to all the stakeholders in case they have interest in related service areas.

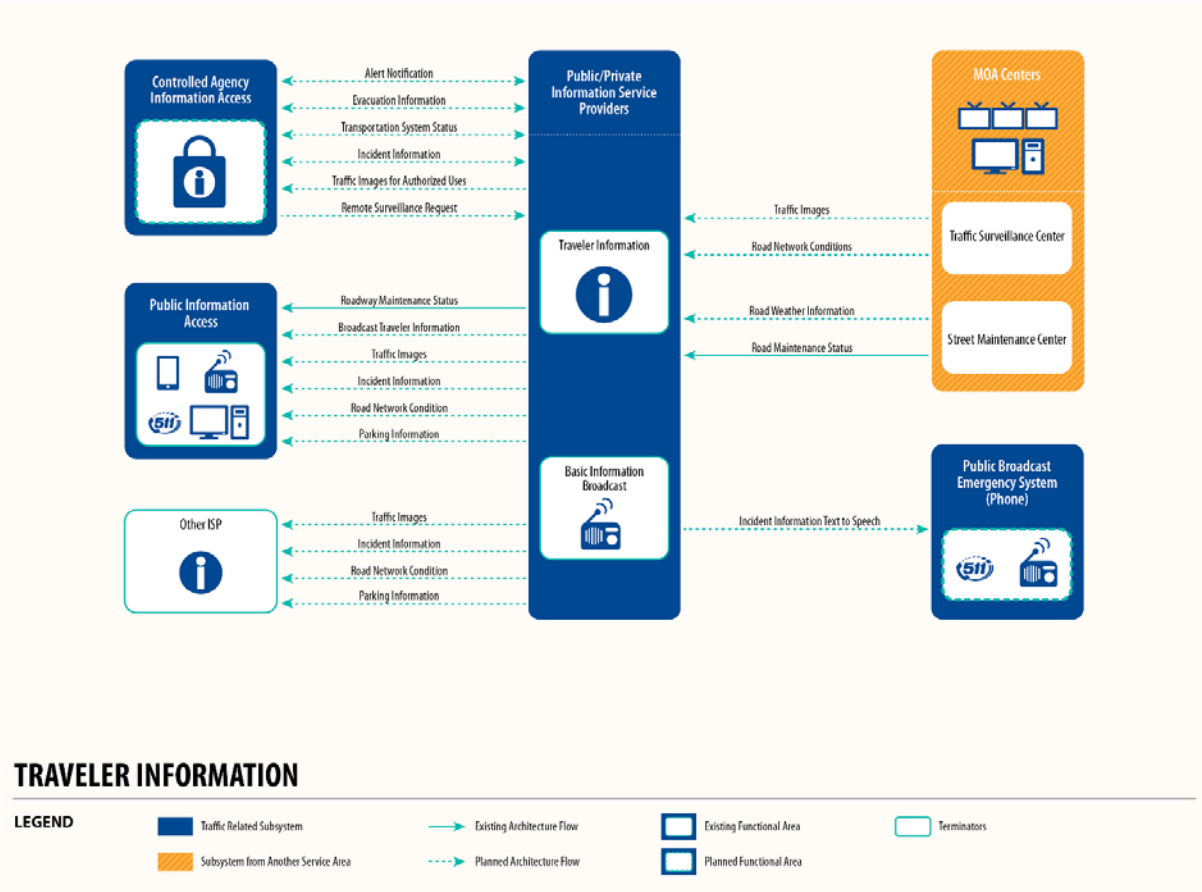
After the webinars are complete, there would be a comment period on the initial architecture to allow stakeholders time to think about the architecture and provide additional comments.

The team will revise the architecture as needed based on stakeholder comments.

Task 3.1 Deliverable: Turbo Architecture database file

Task 3.2: Architecture Documentation

In Task 3.2, the team will develop a single, easy to read and use architecture document. The team will develop service area diagrams that show at a high level, the elements and architecture flows included in each service area. An example of such a diagram (from the Anchorage Architecture) is presented below.



Presented below is a high-level suggested outline for the Architecture Document

1 Introduction
- 1.1 What is ITS?
- 1.2 What is an ITS Architecture?
- 1.3 FHWA Rule 940 on ITS Architecture Compliance
- 1.4 Document Overview
- 1.5 Scope of the ITS Architecture
  - 1.5.1 Description of the Geographic Area
  - 1.5.2 Timeframe
  - 1.5.3 Purpose and Objectives of the Update

2 Background

3 Processes and Outcomes
- 3.1 Turbo Architecture™
- 3.2 Stakeholder Outreach

  A discussion of each stakeholder organization and the needs they articulated

The consultant team will circulate the architecture document to the project team for review and comment. The team will revise the document on the basis of the comments from the project team.

Task 3.2 Deliverable: Iways Architecture Document

Task 3.3: Use and Maintenance Guide

In the first step of this task, the PB team will review the change request form and the systems engineering checklist and recommend any necessary changes based on the revised architecture and examples of similar documents across the country. The PB team will discuss the recommendations with DOT&PF staff and revise as necessary. The team will then present these recommendation in a technical memorandum.

The consultant team will develop the Iways Use and Maintenance Guide in Task 3.3. The Use and Maintenance Guide will incorporate the information from the existing Iways user guide, the revised systems engineering checklist, the revised architecture change request form, and the maintenance plan. It would be structured much like the Anchorage Use and Maintenance Guide.

An example Table of Contents, based on the Achorage Use and Maintenance Guide is presented below.

The consultant team will circulate the architecture use and maintenance guide to the project team for review and comment. The team will revise the guide on the basis of the comments from the project team.

Task 3.3 Deliverable: Iways Architecture Use and Maintenance Guide

Task 3.4: Implementation Strategy

This effort will include webinar workshops to help determine priorities and focus areas of projects. The consultant team will use the results of the workshop to make the implementation plan more useful. Specifically, the workshops will provide greater stakeholder involvement and results in better confidence that the priorities and implementation timeframes are realistic. The consultant team recommends up to 3 webinars, based primarily on geography. Other groupings would also be

possible. The consultant team will work with the project team to determine the number of webinars and the invitees to be included in each. A possible structure for the webinars is presented below:

- Webinar #1 – Central Region
- Webinar #2 – Northern Region
- Webinar #3 – Headquarters and South Coast Region

Another possible grouping would be on service areas, similar to the webinars for the architecture:

- Webinar #1 – Traffic Management and Incident & Emergency Management
- Webinar #2 – Winter Maintenance and CVO & Freight
- Webinar #3 – Public Transportation, Traveler Information, and Data Archive

The consultant team will develop an initial set of implementation strategies or groupings of projects for each of the webinars. The strategies will be based on the architecture, the stakeholder interviews, and existing transportation plans. The webinars will be structured to review the strategies, revise them according to comments during the webinar, add or delete strategies, then prioritize the strategies in a group exercise. From the results of the the webinars, the consultant team will revise the implementation strategy.

The consultant team will circulate the implementation strategy to the project team for review and comment. The team will revise the strategy based on the comments from the project team.

Task 3.4 Deliverable: Iways Architecture Implementation Strategy

Task 3.5: Executive Summary

During Task 3.5, the consultant team will develop an executive summary for the architecture. The executive summary will be high level, 2 to 4 page document utilizing graphics that would make it easy to read and understand. The executive summary could be used as an introduction to the architecture for people who will be using the architecture and would provide a high-level explanation of the architecture for people who need to know about the architecture, but will not likely use it.

The consultant team will circulate the executive summary to the project team for review and comment. The team will revise the summary based on the comments from the project team.

Task 3.5 Deliverable: Iways Architecture Executive Summary

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Existing Document Disposition

For reference, the table below provides the proposed approach to updating or consolidating the existing Iways architecture documents.

Existing Document	Disposition
Systems Inventory	Included in Architecture Document and Turbo file
User Needs & User Services	User Needs included in Architecture Document and Turbo file. User services will be abandoned. Turbo Architecture does not include User services. (The basic building blocks of the National Architecture and Turbo Architecture are elements and flows combined into service packages.)
ITS Long Range Vision	Embedded in the Architecture Document in the Operational Concept chapter.
Operational Concept	Included as a chapter in the Architecture Document
Physical Architecture	Diagrams for service areas will be included in the Architecture Document. The full physical architecture is included in the Turbo Architecture file.
Recommended Course for Implementing	Implementation Strategy
ITS Standards	Included in tables in the Architecture Document appendix and in the Turbo Architecture file
Agreements	Included as a chapter in the Architecture Document
Maintenance Plan	Included in the Use and Maintenance Guide
Turbo Architecture Database & Training	Turbo Architecture file and Task 4 training
Policy for AKIA Use	Included in the Use and Maintenance Guide
Executive Summary	Executive Summary
Organization & User Guide	Included in the Use and Maintenance Guide
Systems Engineering Checklist	Included in the Use and Maintenance Guide

Proposed Schedule

The schedule to complete the 5 tasks is proposed to take 6 months as shown below. After finalizing the scope for this effort, a detailed schedule will be developed.