

Anchorage Regional ITS Architecture Maintenance Plan

Anchorage Metropolitan Area
Transportation Solutions (AMATS)

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ANCHORAGE REGIONAL ITS ARCHITECTURE MAINTENANCE PLAN

APPROVED BY AMATS POLICY COMMITTEE NOVEMBER 15, 2012

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1.0 Introduction

The Anchorage Regional Intelligent Transportation Systems (ITS) Architecture was approved by the AMATS (Anchorage Metropolitan Area Transportation Solutions) Policy Committee on October 14, 2004. The Architecture Final Report included a Technical Memo developed by PB Farradyne for use by Alaska Department of Transportation and Public Facilities (ADOT&PF) and by the Municipality of Anchorage to develop their respective Architecture Maintenance Processes. In 2009, Telvent Farradyne, Inc., developed the Alaska IWAYS Architecture Maintenance Process Technical Memo to document decisions that ADOT&PF made concerning who is responsible for architecture maintenance, what elements are to be maintained, when and how often the architecture will be maintained, and to document the process by which the architecture will be modified or changed. The approach outlined in the second technical memo was offered also as a method to update the Anchorage Regional ITS Architecture. This *Anchorage Regional ITS Architecture Maintenance Plan* is substantially based upon the Telvent Farradyne technical memo, with modifications made for Anchorage.

The Municipality of Anchorage, in cooperation with local ITS stakeholders, developed the Anchorage Regional ITS Architecture (hereafter referred to as the Anchorage Architecture). The Anchorage Architecture provides a framework that is used to coordinate and integrate ITS technologies (e.g., electronics, communications, and information processing software and systems) on a regional level. By identifying the information and coordination flows the stakeholders are able to use applicable standards to facilitate those flows. Each stakeholder is responsible for funding, designing, and implementing their interface to the standardized information, as and when their budgets and needs require, unless otherwise agreed upon by affected stakeholders. When a connection is identified between two stakeholders, the two stakeholders each become committed to adopting the relevant standards and assisting each other with the information needed to complete Systems Engineering Analyses. The Anchorage Architecture does not commit any Stakeholder to fund a specific ITS project in a specific timeframe. It provides a mechanism to provide for compatibility of the flows as such time as the Stakeholder chooses to fund and implement their interface to a flow. Projects and connections are funded by Stakeholders as they identify their need and readiness. Through coordination and integration, ITS technologies will work together as a seamless, compatible system to improve transportation operations and traveler safety throughout the Anchorage region. The Anchorage Architecture, after the planned update in 2012-13, will be comprised of a hardcopy document and an electronic Turbo Architecture database file. The current Architecture consists of electronic diagrams of subsystems and information flows between those subsystems, and a hardcopy document comprised of the following documents, listed in order they were initially developed in 2003/04:

- User Needs
- User Services
- ITS Long-Range Vision
- Operational Concept
- Physical ITS Architecture
- Implementation Plan

Each document listed above represents an important piece of the Anchorage Architecture; each constitutes a step that works toward the goal of developing an effective approach for developing and integrating ITS in the region. To remain effective, each of these documents should be updated periodically as transportation user needs change, as new projects are identified in the Metropolitan Transportation Plan (MTP) and Transportation Improvement Program (TIP), and as new technologies emerge and updates to the National ITS Architecture occur. Despite its 10 year timeframe, updating the Architecture when changes occur ensures that it remains a living, useful document. This in turn ensures that investment in the Anchorage Architecture remains viable through its planned life cycle.

This document provides an initial approach for maintaining the Anchorage Architecture; the Maintenance Plan may be amended over time to accommodate institutional or other changes. Following this approach will allow the Anchorage Architecture to be effectively maintained over time, allowing greater return on the initial investment spent to develop it. Maintaining the architecture will ensure that the architecture remains a viable, useful reference which individuals can benefit from when developing ITS projects and integrating them with other ITS elements. The development of this Maintenance Plan also ensures compliance with requirements set forth by the Final FHWA Rule and FTA Policy governing development of ITS architectures, ensuring that ITS projects considered in the region remain eligible to receive Federal funding.

1.1 Purpose

The purpose of this Maintenance Plan is to promote continued integration and interoperability of systems in Anchorage through the frequent, effective maintenance of the Anchorage Architecture in accordance with National policies and local guidance. In early 2001, the United States Department of Transportation (USDOT) announced the release of the FHWA Final Rule and FTA Policy for applying the National ITS Architecture at the regional level. The FHWA rule and FTA policy set forth a number of requirements for funding ITS projects through the National Highway Trust Fund. One such requirement is that “agencies and other stakeholders participating in the development of the regional ITS architecture shall develop and implement procedures and responsibilities for maintaining it, as needs evolve within the region.” This document helps to fulfill this requirement and ensures that the Anchorage Architecture remains both useful and effective beyond its designed 10-year life span.

This document sets forth and describes a process to periodically update the Anchorage Architecture. Without a formal maintenance plan, the existing Architecture will over time become out of date, requiring significant time and resources be allocated to re-developing the architecture. This in turn will result in the inefficient and unnecessary use of funds and staff resources.

1.2 Background

The Anchorage Architecture was developed to be consistent with both the Alaska IWAYS Architecture and the National ITS Architecture, using an early version of the National ITS Architecture, and was based on identified transportation issues and needs through stakeholder surveys and a literature search. Since that time, the National ITS Architecture has undergone several updates, and it is expected that in the future, further updates to the National ITS Architecture will be released. This document is intended for agencies and transportation professionals responsible for the implementation of ITS technologies in the Municipality of Anchorage, and those responsible for maintaining the Anchorage Architecture.

1.3 Intended Audience

This document is intended for agencies and transportation professionals responsible for the implementation of ITS technologies in Anchorage, and those responsible for maintaining the Anchorage Architecture. It is expected that individuals will use this document as a guide to periodically update the Anchorage Architecture but more specifically to:

- Decide when to update the Anchorage Architecture,
- Define agency responsibilities for updating the Statewide Architecture
- Decide which ITS products must be updated, and
- Define a process for managing changes.

2.0 Maintaining the Architecture

Maintenance is a critical step in the design life cycle of state and regional ITS architectures, including the Anchorage Architecture. The importance of architecture maintenance is underscored in the USDOT rule 940 on regional ITS architectures, Section 940.9(F) which states that “agencies and other stakeholders participating in the development of the regional ITS architecture shall develop and implement procedures and responsibilities for maintaining it [the architecture] as needs evolve within the region”. Although the USDOT rule requires regions that have developed an ITS architecture to develop a maintenance procedure, there are several other beneficial reasons why Anchorage and ITS stakeholders should update their architecture. In addition, there are several other situations that may develop over time, in addition to a change in user needs, that may warrant the Anchorage Architecture be updated. These beneficial reasons and situations are described in greater detail in Sections 2.1 and 2.2 respectively.

2.1 Benefits of Architecture Maintenance

Updating the Anchorage Architecture ensures that it remains a living document that is both useful and effective as a decision support and planning tool for those responsible for operating the region’s transportation network and the ITS-related systems that are part of it.

Updates to the Anchorage Architecture also ensures that it is kept up-to-date, and in line with other state and regional transportation plans, preserving the usefulness of the Architecture in transportation planning activities throughout its 10 year life cycle. For instance, information on project sequencing from the Anchorage Architecture may be used to determine when projects should be considered to be included in the AMATS Transportation Improvement Program so that project funding is available when implementation is planned to occur. If the Anchorage Architecture is not kept up-to-date projects may not obtain the funds needed for implementation, especially, if the architecture has not been updated to include new projects that are not included in the original version of the architecture.

Updating the Anchorage Architecture also offers potential to promote the development of institutional relationships. Workshops can be formed that allow stakeholders to assemble to provide input on ITS activities and to express their needs. Resulting discussions can provide the opportunity for stakeholders to leverage areas where resources and funds can be pulled to support ITS activities in the region.

2.2 When to Update the Anchorage Architecture

The Anchorage Architecture provides the framework to coordinate and integrate ITS technologies in the region. A set of inputs acted as the foundation from which the Architecture was developed. These inputs include: stakeholder input gathered during the course of the project, existing state and regional plans, the National ITS Architecture and ITS-related systems existing or planned for implementation in Anchorage. Over time inputs like these will change, and as a result, the foundation on which the architecture was originally developed will be altered. Therefore, to align the Anchorage Architecture with the altered foundation, or the modified set of inputs, the architecture must be updated. It is recommended that the architecture be modified every time a significant change in user needs or system function occurs. Updating the architecture in this fashion will ensure that all changes are included in the architecture and the architecture always remains up to date.

If the Anchorage Architecture cannot be updated every time there is a significant change, either due to staff workload or skill sets, fiscal constraints or other reason, then effort should be made to update the architecture regularly in defined intervals suitable to ITS activity occurring within the region. In these cases, completing an update at least every four years is recommended, to accommodate updates to the Metropolitan Transportation Plan; however, if there isn’t significant ITS activity in the region, every five years may be suitable. Updating the architecture on a periodic basis (e.g., every 4-5 years) requires that a

temporary list of on-going changes be recorded so that they are not forgotten. The time and level of effort needed to create and maintain such a list might be on the same level as updating the architecture itself, so consideration should be given to the amount of time and resources needed to record changes, and compare that to the time and resources needed to make updates in the document.

Consideration should also be given to the resources required to perform updates, and to plan for related actions in advance of when updates should occur. This includes allocating funds in advance to ensure that updates can be made in a timely manner.

2.3 Reasons Why the Anchorage Architecture May Need to be Maintained

The Anchorage Architecture may need to be revised or updated for one or more reasons. Depending on the circumstances leading to the update, one or more of the chapters that comprise the Anchorage Architecture may need to be modified. The specific chapters to be modified, however, will depend on the reasons for the modification. Updating the Anchorage Architecture will be easier if these reasons are understood. Potential reasons for updating the Anchorage Architecture are described below.

Changes in Regional Needs – Over time, as new transportation problems surface and existing problems are resolved, regional transportation needs will change. Additionally, as knowledge and acceptance of the Anchorage Architecture grows, there will likely be new stakeholders with new needs identified. Since transportation needs form the foundation from which the Anchorage Architecture is based, a change in user needs will likely require significant changes be made to the Anchorage Architecture.

Changes in Institutional Framework – Within the ITS Architecture’s 10 year time frame it is likely that institutional frameworks will evolve to include additional stakeholders, with different perspectives and needs. These new stakeholders may own ITS elements that can be integrated into the existing ITS framework. As a result these new stakeholders should be added to the Anchorage Architecture. It is also possible that the institutional framework will evolve to exclude stakeholders when projects are discontinued or when agencies split or merge. In these cases, stakeholder names may need to be modified, added and/or removed.

Changes in Project Definition – Projects proposed for future implementation may be modified to include, eliminate, or modify elements, connections, or information flows. When changes to project definition occur, the Anchorage Architecture should be analyzed to determine if the modifications are covered by the existing architecture. If the architecture doesn’t adequately include the modified project definition, it should be updated so that these modifications are accurately reflected. Additionally, ITS projects will not always be implemented exactly as they were planned requiring that information be fed back into the architecture after the project is implemented.

Changes in Project Acceptance and Status – In some cases, projects may be added, modified or eliminated altogether. When projects are added or modified, the Anchorage Architecture should be analyzed to determine if an update is warranted to reflect additional information flows, connections, and other impacts associated with these projects. Also, projects that were planned may have been implemented since this last update, requiring that their status be updated. When projects are deleted, all corresponding elements and information flows associated with these projects must be removed, unless similar projects covering the same functions and flows remain.

Changes in Project Priority – From time to time, project implementation may be delayed due to funding constraints and/or institutional challenges, or advanced due to increased need. In these situations, project implementation may occur in a year or timeframe other than the one originally proposed. Using the Anchorage Architecture as an example, a project originally slated for implementation in the short-term may be delayed and pushed back to the mid- or long-term. This will affect other projects if implementation of these projects is dependent on the delayed project. As a result the implementation plan and other elements of the Anchorage Architecture may need to be updated.

Changes to National ITS Architecture Framework – Since the initial development of the National ITS Architecture, there have been several modifications that affect how ITS architectures are developed. These modifications include the addition of new user services, subsystems, and architecture flows to name a few. Version 7.0 of the National ITS Architecture, along with Version 7.0 of Turbo Architecture update software, were implemented October 3, 2012. It is expected that modifications like these will continue as will changes made to policies that dictate how ITS projects are planned and funded. Significant changes to the National ITS Architecture that affect significant aspects of the Anchorage ITS program may lead AMATS to update the Anchorage Architecture.

3.0 First Steps

Before updating the Anchorage Architecture, stakeholders should collectively answer a number of important questions aimed to ease the update process and ensure that the update incorporates the input of all relevant stakeholders. First, stakeholders should decide which agency or agencies will be responsible for updating the architecture and oversee the update process. Second, the selected agencies and the individuals responsible for implementing updates to the architecture should define the products that need to be modified. Third, the available electronic resources used to create previous versions of the Architecture should be collected to ease the architecture update process. Last, procedures to manage Architecture updates should be defined so that changes can be documented at the same time the change is made, eliminating the need to remember what changes have been made, when, and by whom. Each of these tasks is described in greater detail in sections 3.1 – 3.4 respectively.

3.1 Define Agency Responsibilities for Maintaining the Architecture

As the owner of the Architecture, AMATS will be the formal entity responsible for updating the Anchorage Architecture. However, AMATS may develop mechanisms to facilitate this process which relies on the participation of ITS stakeholders to complete this process on a project-by-project basis. Because changes will be proposed from a number of different sources, changes might be outside the range of expertise of one individual. Therefore, AMATS may also elect to develop a panel of individuals representing various regional agencies (for example, law enforcement, emergency response, commercial vehicles, or traffic management) to participate in the update process, or may elect to have a consultant maintain the architecture.

Responsibilities of the maintainer are listed below. The list below is not meant to be exhaustive, but rather a minimum set of responsibilities for maintaining the architecture. Depending on the delegation of responsibilities, these responsibilities may rely solely with AMATS, a consultant or some combination of both parties and or group of individuals.

- Informing agencies and departments of meetings and workshops so as to gauge ITS activity occurring within the region and determining the appropriate actions for updating the Anchorage Architecture.
- Archiving the electronic files and hardcopy documents of the architecture, and disseminating these products to agencies that have a need for them.
- Performing on-going updates to the architecture when a change is approved, or maintaining a list of changes that need to be made when the architecture is periodically updated.
- Archiving and incorporating comments received regarding the Anchorage Architecture, and responding to stakeholders on how these changes were made.
- Establishing a configuration management process and maintaining a change log.

3.2 Define Architecture Products to be Maintained

Updating the Anchorage Architecture requires clear definition of the products to be updated. Clear definition of these products will ensure that every element of the architecture is updated. Additionally, the list of products will act as a method, or check list, that can be used to verify if needed changes were made.

With each update to the Anchorage Architecture, the individuals responsible for updating the architecture should review the following elements to determine if changes are needed. Changes will be needed if the information in any of them is no longer relevant. These elements are identified within FHWA's rule and FTA's policy on ITS Architecture development and are therefore considered important aspects to future updates.

- Description of the region
- List of stakeholders, including key contact information
- Inventory of existing and planned ITS systems
- Documented needs and ITS services associated with supporting systems in the region
- Operational concepts
- System functional requirements
- Documentation of existing and planned interconnects and information flows
- Documentation of project sequencing
- List of agency agreements
- Documentation of applicable, in use, or planned ITS standards

3.3 Obtain Available Electronic Resources

Before beginning the Architecture update process, the update team should gather available electronic resources developed or used in previous architecture development or update efforts. The resources include all electronic files (i.e., graphics, databases, and document files) that were produced in the original architecture development and subsequent updates. Without these files, updating the Anchorage Architecture will be more difficult as files will need to be recreated if affected by the update.

Data/electronic files that need to be collected include:

- Electronic copies of the Anchorage Architecture documentation (6 documents)
 - Electronic copies of tables/graphics not embedded in the Architecture documentation
 - Most current version of the National ITS Architecture (available on the internet as well as CD)
 - Inventory of stakeholders' systems (e.g., Turbo Architecture File)
 - Recently released Regional Transportation Plans (electronic preferred)
 - Stakeholder input/workshop transcripts or summaries
- All files created/used by the consultant or other agency responsible for the development or last update to the Anchorage Architecture

3.4 Manage Changes

Before updates are made to the Anchorage Architecture, the update team should establish a process for recommending, implementing, tracking, and documenting changes. Following a process to manage change will ensure that a common approach is used each time the Anchorage Architecture is updated.

When a new project is identified, or when another change must be made to the Anchorage Architecture, an architecture update form should be completed by the agency or individual seeking to make the change. Approved changes to the Anchorage Architecture will be made during the next scheduled update. A sample change form is provided in Table 1-1. This form should be used to inform ADOT&PF of the change, and sent to the Municipality of Anchorage ITS Coordinator at the following address:

Municipality of Anchorage
 Transportation Planning, Community Development Department
 4700 Elmore Road
 P.O. Box 196650
 Anchorage, AK 99519
 (907) 343-7995
 E-mail: underwoodvr@muni.org

A defined change management process will reduce the time and effort needed to determine changes made in previous updates to the Anchorage Architecture. It will also reduce confusion regarding which draft of the architecture is most current, ensuring that updates are applied to the correct version of the document (version control).

4.0 Turbo Architecture Database Modification

Turbo Architecture is a free software application offered through the USDOT that supports development and maintenance of ITS Architectures. The Turbo software uses the underlying framework of the National Architecture to allow architecture developers to develop their ITS Architectures using a consistent, common platform. By downloading, and using the most recent version of the software platform AMATS can effectively update their architecture, ensuring that any updates made are consistent with the National ITS Architecture. The original Anchorage Architecture was not created using Turbo Architecture, but will be converted into Turbo Architecture during the scheduled 2012-13 update. The Turbo file is a valuable tool in that it preserves the knowledge and effort expended to develop the Anchorage Architecture. In turn this knowledge can be brought forward when new projects are identified and need to be included in the Anchorage Architecture.

The Anchorage Turbo database file will contain attributes of the Anchorage Architecture, including stakeholders, existing and planned ITS elements, high-level functions, system-to-system interconnects and information flows, and applicable standards. These attributes loosely correlate to the reasons why the architecture needs to be maintained, as previously discussed in Section 2.3. For instance the Turbo

Architecture software contains a tab called ‘Stakeholders’. Every time there is a change to the Anchorage Architecture that pertains to a stakeholder, information in the “Stakeholder” tab should be updated.

When updating the Turbo Architecture file, a new “project architecture” should be created to capture the changes proposed and ultimately made to the Anchorage Architecture. A new project architecture can be created in the “Start” menu, by clicking the button “New” under the Project window. The new project will contain just the attributes of the “project” being initiated until all the changes are recorded. At that time, the results of the project can be uploaded to the Anchorage ITS Architecture by clicking on the “Project-to-Region” button in the ‘Start Menu’. When uploaded the Anchorage Architecture is automatically updated to include changes that occurred as a result of adding the project.

Table 1-1:
Anchorage Regional ITS Architecture Change Request Form

Change Information	
Project Name:	Request Date:
Description of Requested Change:	
Type of Change:	<input type="checkbox"/> New Project (if new project select one of the following) <ul style="list-style-type: none"> <input type="checkbox"/> Proposed (funding not secured) <input type="checkbox"/> Planned (funding secured) <input type="checkbox"/> Under Construction (project currently being deployed) <input type="checkbox"/> Existing <input type="checkbox"/> Deleted Project <input type="checkbox"/> Modified Project <input type="checkbox"/> Change to a User Need <input type="checkbox"/> Change to Project Status <input type="checkbox"/> Change to Project Priority <input type="checkbox"/> Change to National ITS Architecture <input type="checkbox"/> Change to ITS Standards <input type="checkbox"/> Other
Change Rationale:	
Agencies Involved, Including Roles:	
Additional Notes:	
Submitter Information	
Name and Title:	
Agency:	

Address:	
Phone Number:	
E-mail:	

5.0 Document Modification

After the Turbo Architecture file is updated, individuals responsible for updating the Anchorage Architecture can use the updated Turbo file to more easily update the existing hardcopy documentation. Significant changes in user needs or ITS program direction, or the addition of or change to significant functions that are not reflected in the Anchorage Architecture will require that the six documents or chapters that comprise the Architecture be updated. To summarize, these chapters in the order they were last updated are listed below.

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

The order in which each chapter was developed and last updated was based on the USDOT recommended process for developing a regional or statewide ITS architecture. In general, this process moves from high-level concepts to specific details, and as a result, each chapter in the architecture acts as the foundation for the next. For example, Chapter 1 (user needs) defines the concepts needed to develop Chapter 2 (user services), Chapters 1 and 2 define the concepts needed to develop Chapter 3, and so on. This process is illustrated in the figure on the next page. Therefore, when a decision is made to modify the architecture, it is important that the individual or group of individuals responsible for maintaining it follow this process as it will be the most efficient, comprehensive and familiar method of updating the Anchorage Architecture.

Since the process illustrated in the diagram is intended for use in developing ITS architectures, individuals responsible for maintaining the architecture do not have to recreate each document, but rather adopt the process to review documents for the modifications that need to be made. Therefore, the individual or group of individuals should begin with the first chapter in the process (Chapter 1: User Needs) and determine if there are any changes that need to be reflected, implement the changes, and when finished proceed to the user services chapter, repeating these steps for each chapter.

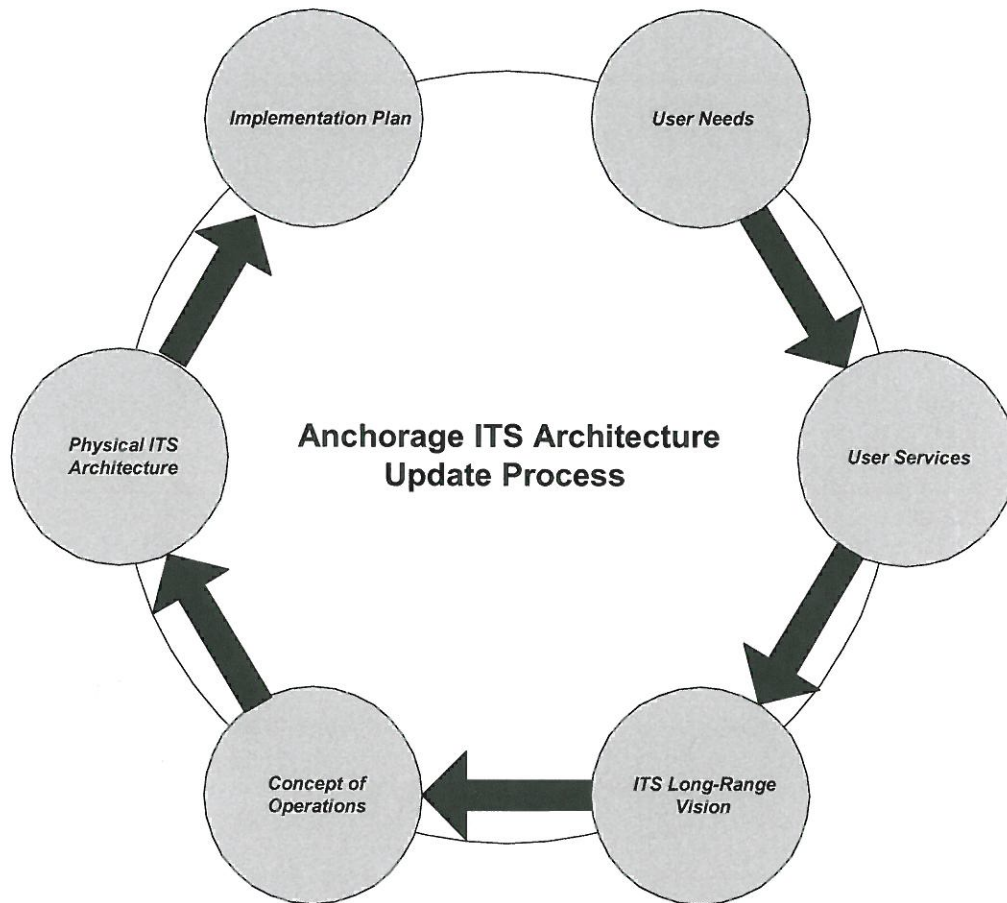
5.1 User Needs

Definition of the user needs was the first major step taken to develop the Anchorage Architecture. User needs act as the foundation from which the remaining pieces of the architecture were developed. As stated previously, the ITS Architecture update process should begin with a review of the User Needs Chapter to determine if any new user needs should be added to this document and incorporated into the text of other chapters.

If stakeholders identified one or more new user needs, the update team should modify the text in the User Needs Chapter to reflect the new user need(s). Since the user needs chapter acts as the foundation for development of the other chapters, a change in user needs will require that one or more of the remaining five chapters be modified.

If a new user need is identified, modifications to the User Needs Chapter will be rather straight forward and easy to implement compared to subsequent changes to the other chapters. In general, the complexity of changes made to the Anchorage Architecture will become greater as one works toward the last chapter (Implementation Plan). The only change that will need to be made to the User Needs Chapter will be to update the user need descriptions. This may involve modifying the existing text to alter the meaning of an existing user need, adding an entirely new user need, or removing a need that is no longer relevant.

After the update team updates the user need descriptions, or modifies existing text to better describe the need, the team should carry the changes made over to Chapter 2 (User Services). If new user needs were added to Chapter 1, the new needs will need to be mapped to National ITS Architecture User Services in Chapter 2. If User Needs were modified or removed in Chapter 1, then appropriate changes need to be made to the User Services in Chapter 2.



5.2 User Services

National ITS Architecture User Services allow system or project definition to begin by establishing high-level services needed to address identified user needs. The Anchorage Architecture maps identified user needs to National ITS Architecture User Services. Therefore, any change in user needs will at a minimum require that the individual or group of individuals responsible for maintaining the architecture review the newly incorporated user needs to determine which user services, if any, satisfy the new user needs. Newly identified transportation user needs may map to user services already documented in the Anchorage Architecture. If this is the case new user needs should be mapped to the existing user services. However, it is possible that user services identified in the Anchorage Architecture may not satisfy any or all of the newly identified user needs. In this case, the update team should review user services in the most recent version of the National ITS Architecture and determine their applicability to the new user needs. If a new user service (from the most recent version of the National ITS Architecture) satisfies one or more of the new user needs, it should be mapped to the user need, and a description of the new user service should be added to the text in Chapter 2. If the new user service is derived from a version of the National ITS Architecture more recent than the one previously used, it will be necessary for the update

team to update all the outdated user services in the Anchorage Architecture with the new ones in the most recent version of the National ITS Architecture.

If a new user need maps to one of the National ITS Architecture user services not already included in the Anchorage Architecture, the update team should add a description of the user service to the appropriate section of the User Services Chapter. This may involve the addition of a new user service bundle as well as the actual user service. Currently there are eight user service bundles in the National ITS Architecture:

- Travel and Traffic Management
- Public Transportation Management
- Electronic Payment
- Commercial Vehicle Operations
- Emergency Management
- Advanced Vehicle Safety Systems
- Information Management
- Maintenance and Construction Management

If a new user need maps to one of the National ITS Architecture user services included in the Anchorage Architecture, the update team does not need to add a description of the user service as it already exists. However, the update team should verify that the description of the user need in National ITS Architecture is consistent with the description of the User Need in the Anchorage Architecture. Additionally, the update team should map the new user need to the existing user service. For instance Table 2-1 (User Needs to User Service Correlation) will need to be updated.

If a new user need does not map to a National ITS Architecture User Service, a description of the need should be added to a new Appendix A – Other Transportation Needs. In the future, as the National ITS Architecture is updated, it may be possible to map these user needs to newly incorporated user services.

5.3 ITS Long-Range Vision

The Anchorage ITS Long-Range Vision was developed based on the transportation desires and needs expressed by Anchorage ITS Stakeholders. Although it is not expected that these desires and needs will change significantly in the next ten years, institutional changes, and shifts in policy may require that the update team modify the Anchorage ITS Vision. Of particular importance are Sections 3.2 and 3.3 titled Goals and Future ITS Elements, respectively. Any changes to either goals or future ITS elements should be reflected in the applicable sections of the ITS Long-Range Vision and carried over into the remaining documents (i.e., Concept of Operations, Physical ITS Architecture, and Implementation Plan).

5.4 Concept of Operations

The Concept of Operations identifies the physical infrastructure that comprises the Anchorage Architecture and defines the agency operational roles and responsibilities for implementing, operating, and maintaining it. When a new ITS concept or function is planned for implementation in Anchorage, the Concept of Operations will need to be updated. Items that may need to be updated include:

- Current Agency Operations
- ITS Element Inventory
- Communication Systems
- ITS System Deployment Status
- Agency Roles and Responsibilities associated with Concept of Operations

If a previously unidentified stakeholder implements a new project or associated system, a description of the stakeholder should be added to the existing text. The new description should reflect the agency's ITS functions, the other organizations or agencies with which it shares data, and other relevant data that help describe the agency's role in terms of ITS operations. The modified text should describe the entire agency's ITS related systems, in National ITS Architecture terms.

If an existing stakeholder implements a new project or system, a description of the stakeholder does not need to be added as it already exists. However, the description of the stakeholder should be reviewed and updated if its operational responsibilities have changed. Additionally, the update team should add a description of the new system being implemented to all relevant sections of the chapter.

When stakeholder and/or system descriptions are added or updated, stakeholders should take the opportunity to update descriptions of legacy systems, including any changes in current deployment status.

If new systems have been deployed in Anchorage since the last time the Anchorage Architecture was updated, the person or group of people responsible for updating the architecture should map these systems to the National ITS Architecture by identifying the applicable User Services, Sub-Systems, and Equipment Packages to which new systems apply.

5.5 Physical Architecture

The Physical ITS Architecture should be updated whenever there is a change to the Anchorage ITS program (e.g., new system is implemented or planned). Through the update process, connections with the new system and existing systems will be defined making it possible to identify the other systems it will communicate with and the data that will be communicated. Although not required, it may also be beneficial to update the Physical ITS Architecture when the National ITS Architecture is updated. This will ensure that terminology used in the Physical Architecture document remains consistent with that of the National ITS Architecture.

When a new project is identified, it must be mapped to National ITS Architecture Service Packages (formerly termed Market Packages). In Transportation Planning, Service Packages are directly related to ITS strategies to implement regional goals and objectives identified through the Metropolitan Transportation Plan (MTP) and projects identified in the Transportation Improvement Program (TIP). A project may or may not require that a new Service Package be added to the Anchorage Architecture. If a new Service Package is identified and included in the Anchorage Architecture, the new Service Package(s) should be cross referenced to applicable User Services. Currently there are eight Service Packages in the National ITS Architecture:

- Archived Data Management
- Public Transportation
- Traveler Information
- Traffic Management
- Vehicle Safety
- Commercial Vehicle Operations

Emergency Management

Maintenance and Construction Management

The Physical ITS Architecture interconnect diagrams and architecture flows, currently available electronically only, must be updated whenever a new system is implemented or system scope is modified. New systems should be added, as well as the information flows that connect them to other systems. The diagrams will be converted during the 2012-13 Architecture update into a more user friendly format.

Changes that occur as a result of updates to previous chapters must also be incorporated in this chapter. These changes include modifications made to stakeholder and element names, as well as element status (e.g., planned or not planned).

5.6 Implementation Plan

Over time, the status of projects slated for implementation in Anchorage will change. For instance, if the Anchorage Architecture has not been updated in several years, a project classified as a potential future project may have been implemented since the last time the Architecture was updated. This will require that current text be modified to reflect this change in status. (Although, this natural change in status of projects should not, in and of themselves, necessitate an update to the Anchorage Architecture). Likewise, new projects that have yet to be implemented may be identified. A description of these projects should be added to the description of future potential projects.

Similar to project status, project phasing or conceptual integration, will also change. For instance, a project slated for implementation in the short-term may have been implemented since the last time the Anchorage Architecture was updated. This project along with others that have been implemented should be removed from the list of short-term projects and replaced with projects originally slated for implementation in the long-term. Likewise, long-term projects should be replaced with newly identified projects that will be implemented 5-10 years in the future.

6.0 Final Steps

Upon updating the Anchorage Architecture, there are a couple final steps that need to be made. These steps are summarized below.

6.1 Notify Stakeholders

After each update to the Anchorage Architecture, the update team should notify stakeholders of the changes that have taken place. Stakeholder notification will allow individuals responsible for other transportation activities within the state the opportunity to adjust their plans based on the updates that were made to the Anchorage Architecture. Stakeholder notification will also help maintain stakeholder familiarity with Anchorage ITS activities. Before stakeholders are notified, however, decisions pertaining to who will be notified and how this notification should occur need to be made.

6.2 Archive Files

The individual or group of individuals that update the Anchorage Architecture should archive all files that were created and or used during the Anchorage Architecture update process, according to the change management process described in section 1.3.4. The archive can be a simple folder located on an

agency's network. To increase the security of the files, a copy of all the files should be stored on a CD in case the integrity of the network is jeopardized or the file is accidentally deleted. The contents and location of the folder or archive should be documented and stored with the updated version of the architecture (hardcopy) so that files can be easily located next time the architecture is updated.