

How to Access and Use Turbo Architecture

The AKIA and ARIA turbo architecture files are available on the Iways ITS Architecture webpage. Turbo Architecture free online training is available by visiting the National ITS Architecture website:

<http://www.iteris.com/itsarch/html/training/training.htm>

Following the instructions on the National ITS Architecture website will direct the user to the National Highway Institute (NHI) website where the user can sign up for the Turbo Architecture training course.

This guide does not provide step-by-step instructions on how to perform tasks in Turbo Architecture. For high level of detail instructions, training for the Turbo Architecture software is available for free online via a sign-up process. For more information on how to receive online training, please refer to the following link:

<http://www.iteris.com/itsarch/html/training/turbowebbasedtraining.htm>

In addition, the user should be familiar with the overall scope of the architecture. The more the user understands the goals and purposes of the components of the architecture, the easier it is to understand how to use the AKIA Turbo Architecture file.

How is the ITS Architecture organized?

The ITS Architecture consists of two main products: the AKIA report document and the Turbo Architecture database file. The FHWA Rule 940 and FTA National ITS Architecture Policy on Transit Projects identifies components required in ITS architecture development. These components are listed below, along with where to find them within the architecture products.

- Description of the region
 - Document
 - *Section 1.1.1 Description of the Region*
 - Turbo Architecture File
 - A description of the region was not inputted into the Turbo Architecture file. However, the user may choose to do so in the *Start* tab if desired.
- List of stakeholders
 - Document
 - *Section 3.2 Stakeholder Outreach*
 - Turbo Architecture File
 - *Stakeholders* tab of the respective service area
- Operational concept
 - Document
 - *Chapter 4 Operational Concept*
 - Turbo Architecture File
 - Each service area is displayed as separate “Project architectures” that can be selected in the *Start* tab. The best way to examine the operational concept is to output a flow diagram for each service area. Do not mistake the *Ops Concept* tab in Turbo for operation concept in the document. The *Ops Concept* tab is actually for inputting stakeholder roles and responsibilities.

- Agency agreements
 - Document
 - *Chapter 7 Agreements*
 - Turbo Architecture File
 - Agreements were not inputted into the Turbo Architecture file. However, there is an *Agreements* tab where agreements can be inputted if desired.
- Functional requirements
 - Document
 - *Appendix C: Functional Requirements*
 - Turbo Architecture File
 - *Requirements* tab of the respective service area
- Existing and planned interconnects/flows
 - Document
 - *Appendix D: Architecture (Data) Flows & Flow Diagrams. Chapter 4 Operational Concepts* also displays some flows in the diagrams. *Chapter 5 Interfaces and Information Exchanges* displays the interconnect diagram.
 - Turbo Architecture File
 - *Interfaces* tab
- Applicable ITS standards
 - Document
 - *Chapter 6 Standards and Appendix E: Standards*
 - Turbo Architecture File
 - *Standards* tab of the respective service area
- Project sequencing
 - Document
 - There was no project sequencing in this project.
 - Turbo Architecture File
 - N/A

The AKIA documents can help in understanding the architecture, which will help in using the Turbo file. The AKIA update document is broken up into seven major chapters and five appendices that outline the revamped architecture. These seven major chapters are as follows:

- Chapter 1: Introduction
 - This chapter provides an overview of the update process, including the contents of the report, the description of the region, timeframe, and purposes and objectives.
- Chapter 2: Background
 - This chapter summarizes the past events and projects that lead up to the implementation of the AKIA update.
- Chapter 3: Processes and Outcomes
 - This chapter mainly focuses on the key stakeholders involved in the AKIA update process.
- Chapter 4: Operational Concept
 - This chapter presents the service areas that were tailored from the National ITS Architecture to support the stakeholder needs and regional goals. This includes the architecture flow diagrams and the stakeholder roles and responsibilities in each service area.
- Chapter 5: Interfaces and Information Exchanges
 - This chapter displays an overview of the interconnects and flows used in the AKIA.
- Chapter 6: Standards

- This chapter discusses the standards that may be applicable to the flows identified in the ITS architecture.
- Chapter 7: Agreements
 - This chapter outlines any existing and future agreements within the region that may be required to implement the architecture service areas.

The architecture document also contains appendices that reflect the tables in the Turbo Architecture file:

- Appendix A: Glossary of Terms
 - This appendix provides a list of definitions for words used in the document as well as key words relating to the National ITS Architecture.
- Appendix B: Architecture Flow Definitions
 - This appendix differentiates user-defined flows and default National ITS Architecture flows used in the AKIA. It also provides a description of what the flow entails.
- Appendix C: Functional Requirements
 - This appendix provides the requirements of individual elements within each service area as well as the high-level status of each.
- Appendix D: Architecture Flows
 - This appendix presents the every flow documented in each service area. To aid in the interpretation of the flows, service flow diagrams are provided as well.
- Appendix E: Standards
 - This appendix displays the standards applicable to each service area.

Turbo Database Structure & Components

The Turbo Architecture file contains the physical ITS architecture for the state of Alaska. Use of the software allows for an easy comparison to the Anchorage Regional ITS Architecture (ARIA) and the National ITS Architecture. Any future updates to the National ITS Architecture should result in an update to the Turbo Architecture software to reflect those changes.

As the AKIA was updated, the same sequence outlined by the FHWA for developing an ITS architecture was followed. This process can be reviewed by examining the FHWA Regional TIS Architecture Guidance Document’s flow chart:

<http://ops.fhwa.dot.gov/publications/regitsarchguide/2procoverview.htm>

In the Turbo Architecture software, there are 10 tabs comprising an ITS architecture. These 10 tabs are displayed at the top of the program interface as shown in Figure 1Figure 1.



Figure 1. Turbo Architecture Tabs

See below for a quick overview of the 10 tabs in the Turbo Architecture main interface:

- Start
 - This tab is where architectures can be managed within a single file. The user can create a regional architecture and multiple project architectures.

- Planning
 - The planning tab is where the transportation planning process objectives and strategies can be linked to the ITS architecture components. **This tab was not used in the AKIA.**
- Stakeholders
 - This is the tab where stakeholders are inputted into the architecture. Users can group similar stakeholders performing similar functions into a stakeholder group.
- Inventory
 - This is where the user can input the ITS elements into the architecture
- Services
 - This tab allows for the user to associate elements inputted in the Inventory tab to National ITS Architecture defined service packages. **This tab was not used in the AKIA.**
- Ops Concept
 - The Operational Concepts tab allows for the user to specific the roles and responsibilities of the stakeholders in the architecture. Users can create project areas that narrow down the responsibilities to specific service packages.
- Requirements
 - This tab is where the user can specify the functional requirements of each architecture element.
- Interfaces
 - This tab is where the architecture interconnects and flows are built from the inputted data in the previous tabs.
- Standards
 - This tab contains a list of standards that apply to the selected flows in the interfaces tab. This list of standards is automatically populated based on the interface tab.
- Agreements
 - Users can input agreements amongst different stakeholder agencies in this tab. **This tab was not used in the AKIA.**

In summary, only seven out of the 10 available tabs in the software were used in the 2016 AKIA update. Therefore, it is only necessary to view those seven tabs because the remaining three have no information in them. The three tabs not used are the Planning, Services, and Agreement tabs.

Service Areas

Tailored flows were needed for the AKIA in order to reflect the needs of stakeholders in the State. Customizing service packages was not possible due to the lack of this capability in the Turbo Architecture software (version 7.1). A workaround was used to address this issue. Customized individual service areas were created as project architectures instead. By creating each service area as individual architectures, Turbo Architecture was able to display the tailored flows in project architecture flow diagrams.

In addition, the services tab was not used because the benefits of using service packages did not outweigh the work required for the implementation and maintenance of service packages in the AKIA. Creating service areas that consist of flows from varying service packages without using service packages themselves reduces extra steps and simplifies the architecture. By removing this extra layer of complexity, the AKIA becomes easier to use and maintain.

There are seven service areas created as a project architectures within the Turbo database. These seven service areas are labeled as:

- 1) AKIA: Traffic Management
- 2) AKIA: Winter Maintenance
- 3) AKIA: CVO and Freight
- 4) AKIA: Public Transportation
- 5) AKIA: Incident and Emergency Management
- 6) AKIA: Traveler Information
- 7) AKIA: Data Archive

These seven service areas are treated as project architectures and can be accessed in the *Start* tab as shown in Figure 2.

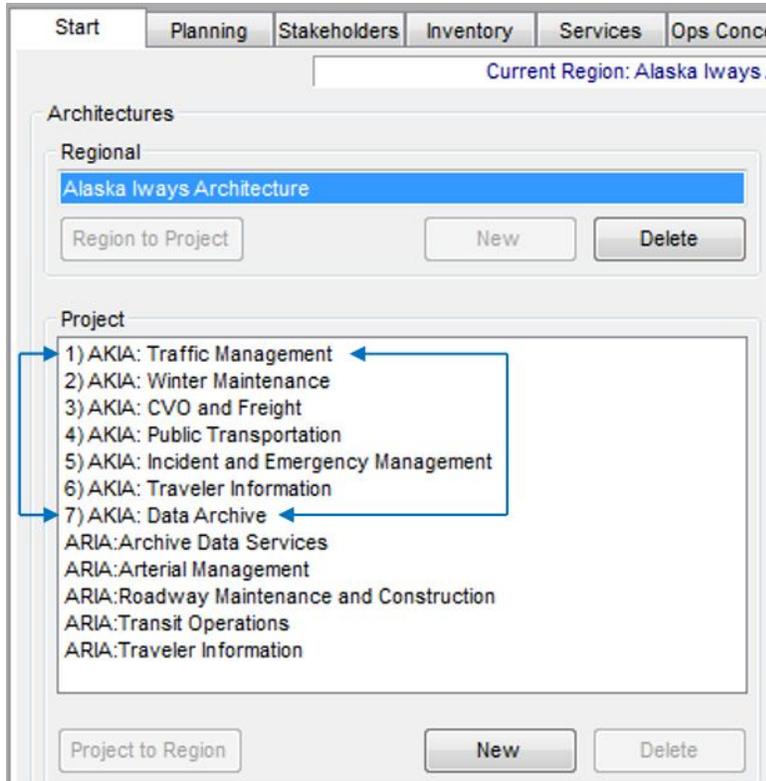


Figure 2. AKIA Service Areas in Turbo Architecture

In this AKIA update, service areas were created as individual project architectures to create data flow diagrams that were better suited for the stakeholder needs. These project architectures use elements and stakeholders from the overall “regional architecture”.

To access a service area, the user selects the service area project architecture from the *Start* tab. Once a service area has been selected from the *Start* tab, every tab that follows it applies to that service area (i.e. the stakeholders tab will only display stakeholders directly involved in that service area).

As mentioned, service areas were used instead of the National ITS Architecture service packages to tailor the architecture to the systems in Alaska. Essentially, these service areas are made up of components of service packages without directly using the service packages themselves. These service areas were created from scratch by adding individual elements and flows. Guidance from the National ITS Architecture website was useful in the creation of service areas from scratch without adding service packages and

modifying them. Users can gain access to information on the National ITS Architecture service packages by referring to the following link: <http://www.iteris.com/itsarch/html/mp/mpindex.htm>

To access a service area as a project architecture, the user would the user will select Service Area through the *Start* tab as shown in Figure 3.

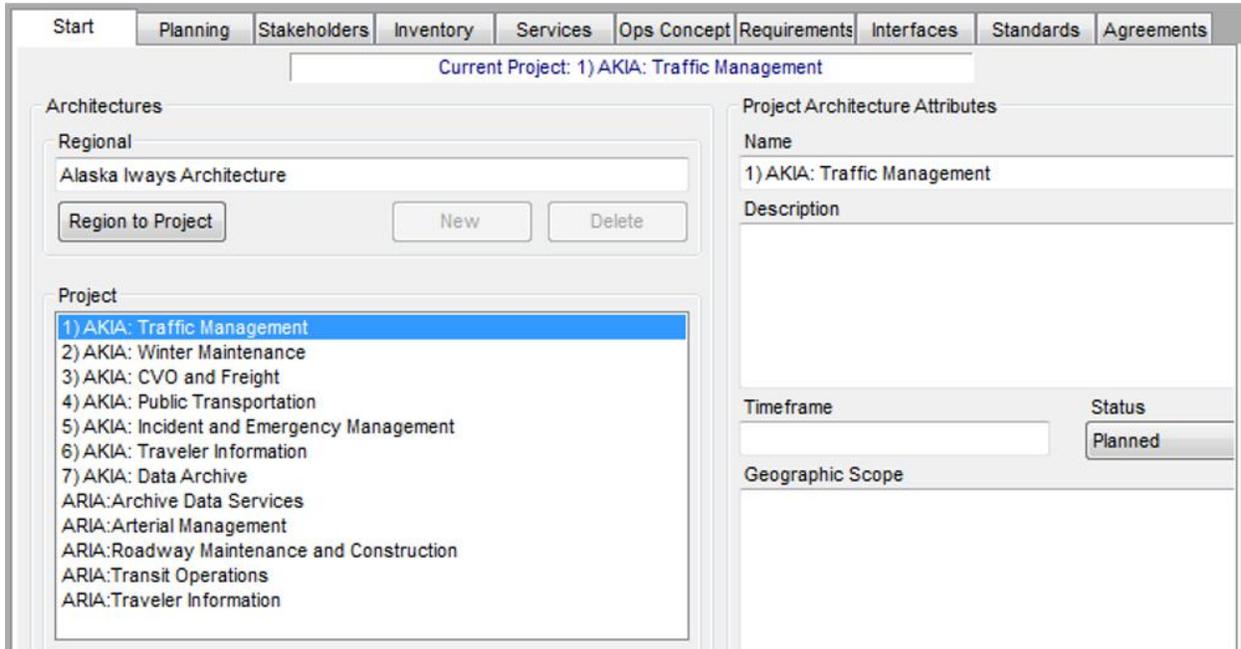
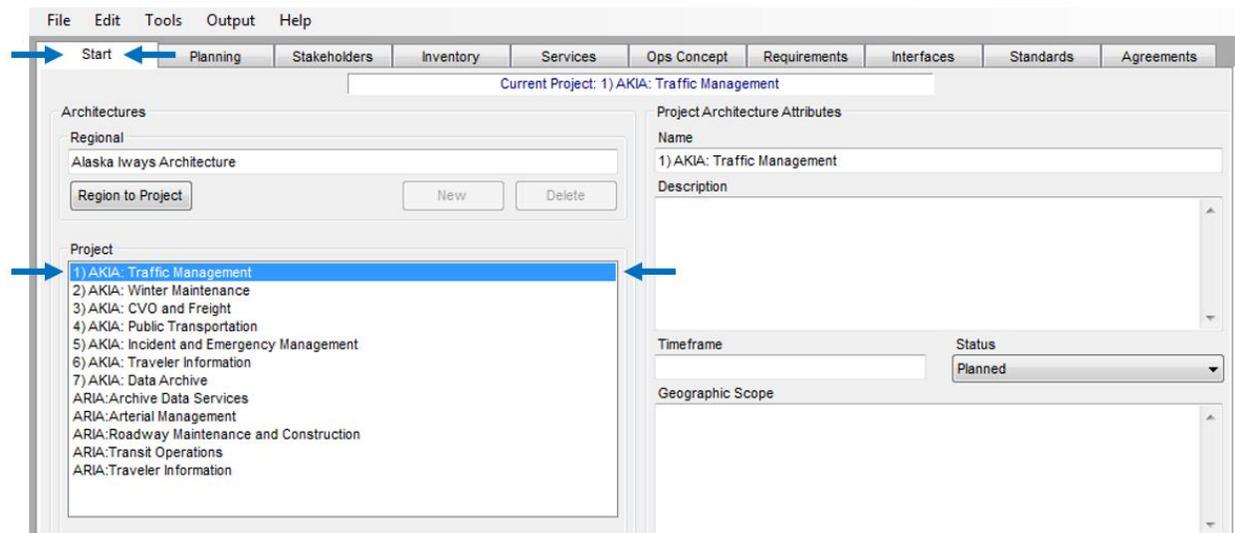


Figure 3. Accessing a Service Area

Accessing Stakeholders

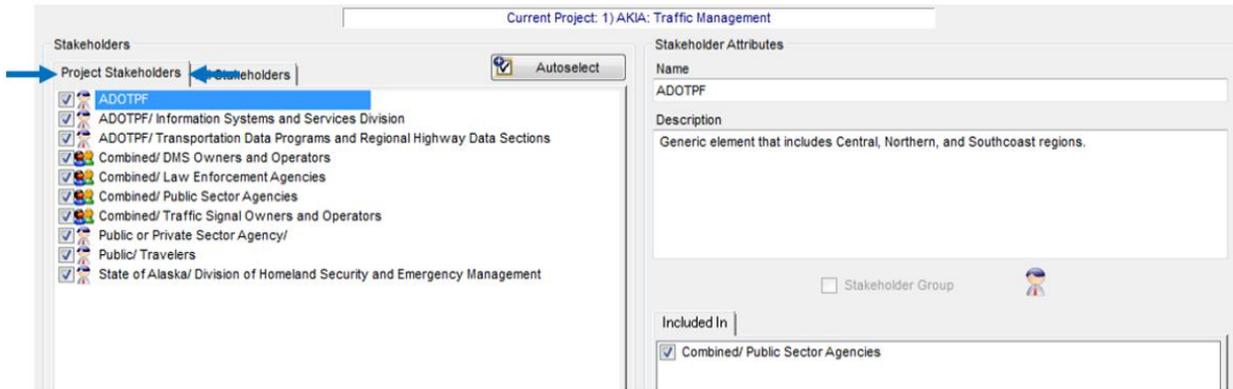
- 1) In the **Start tab**, select the Service Area you want to modify stakeholders for. In the AKIA, Service Areas are presented as **Project Architectures**:



2) Once the Service Area has been selected, click on the **Stakeholders tab**:

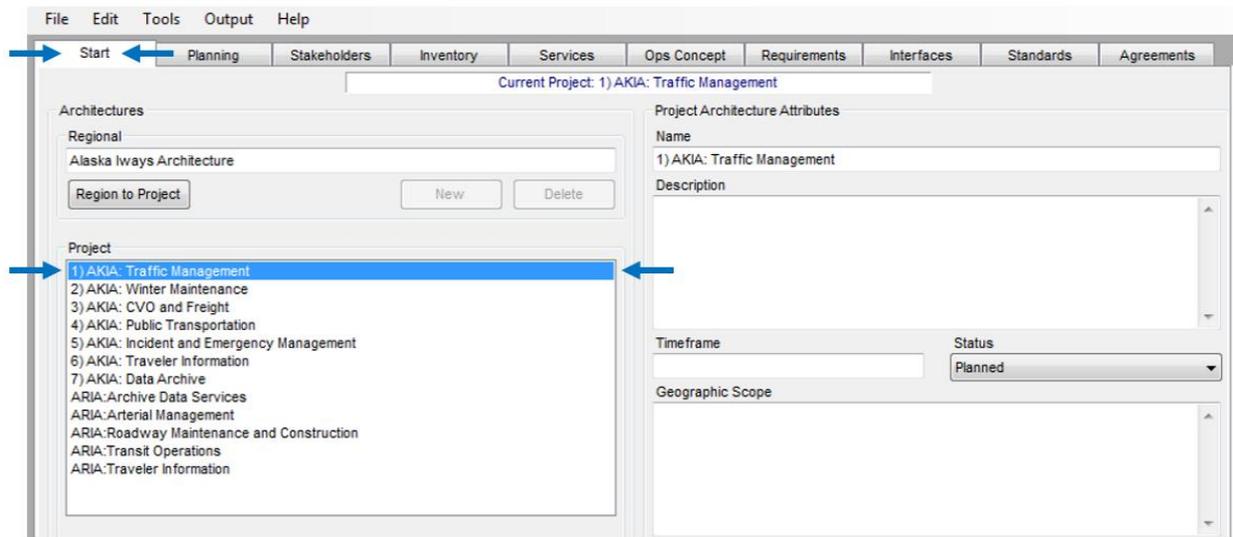


3) Once you have selected the **Stakeholders tab**, the stakeholders belonging to that Service Area should appear. These are listed under the **Project Stakeholders** tab to the left:



Accessing Architecture Elements

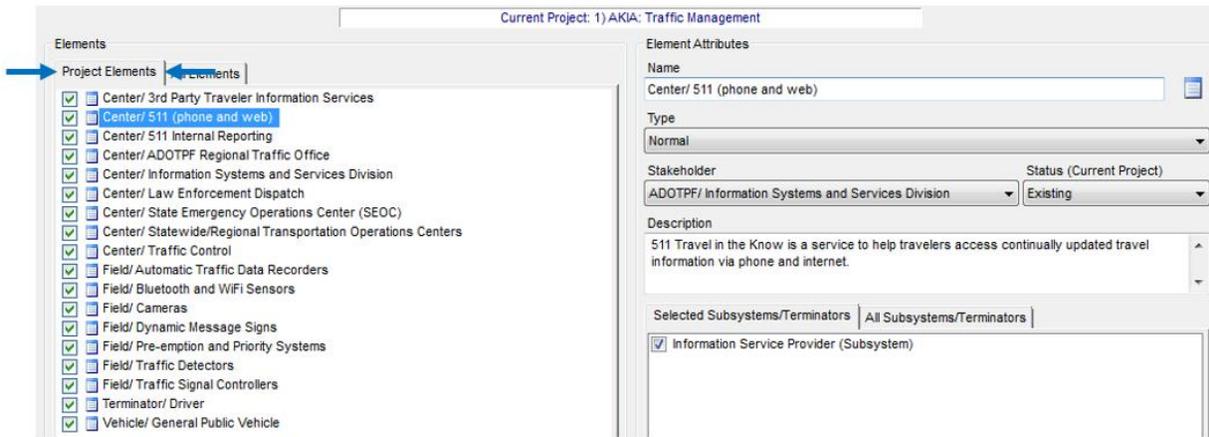
1) In the **Start tab**, select the Service Area of interest.



2) Once the Service Area has been selected, click on the **Inventory tab**:

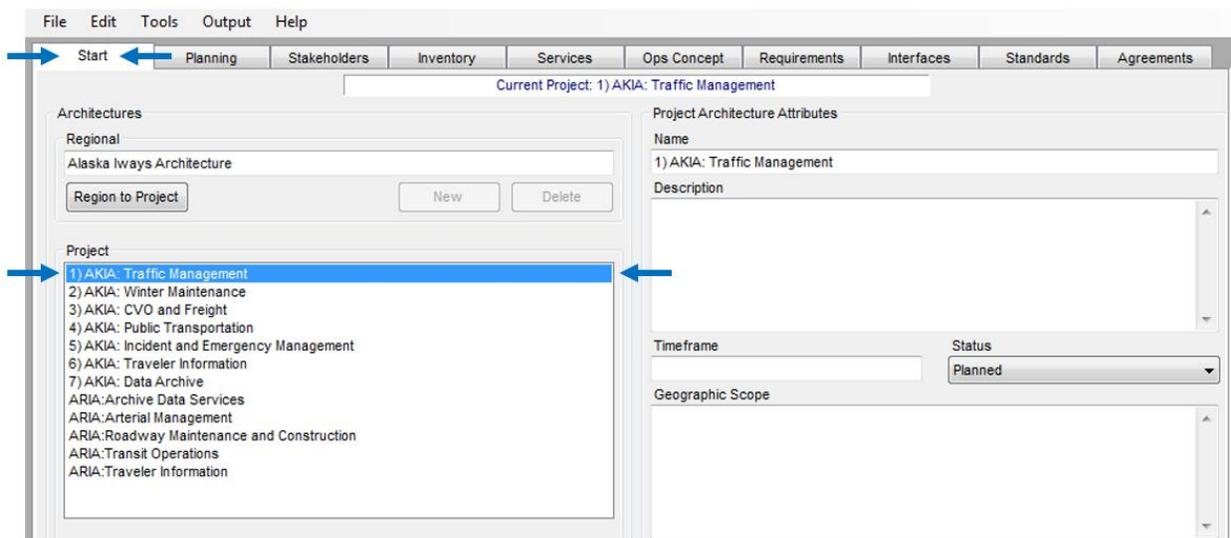


- Once you have selected the **Inventory** tab, the elements belonging to that Service Area should appear. These are listed under the **Project Elements** tab to the left:

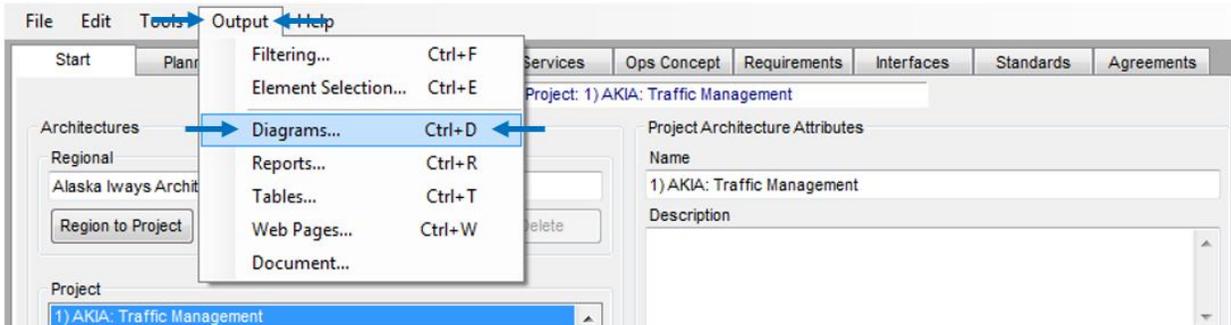


Accessing Architecture Flows

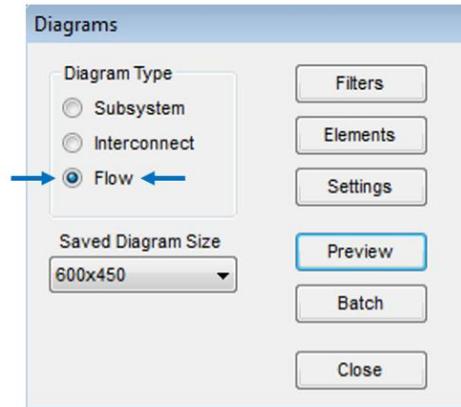
- Within a Service Area, you can create Turbo's Flow Diagrams. In the **Start** tab, select the Service Area you want to create a flow diagram for.



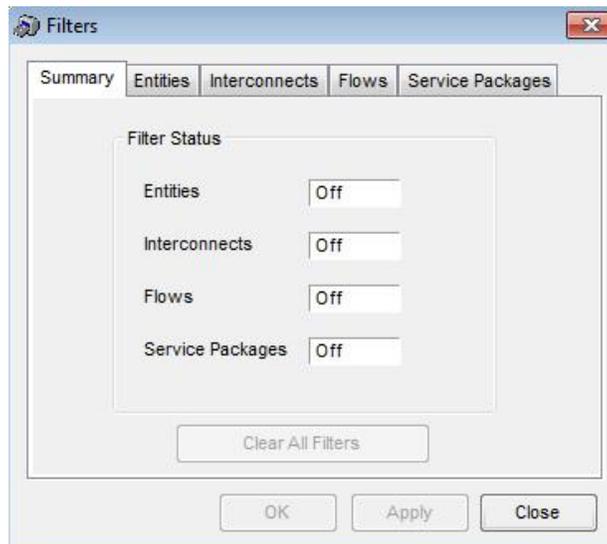
- Once the Service Area has been selected, click on the **Output** menu, then click **Diagrams...**:



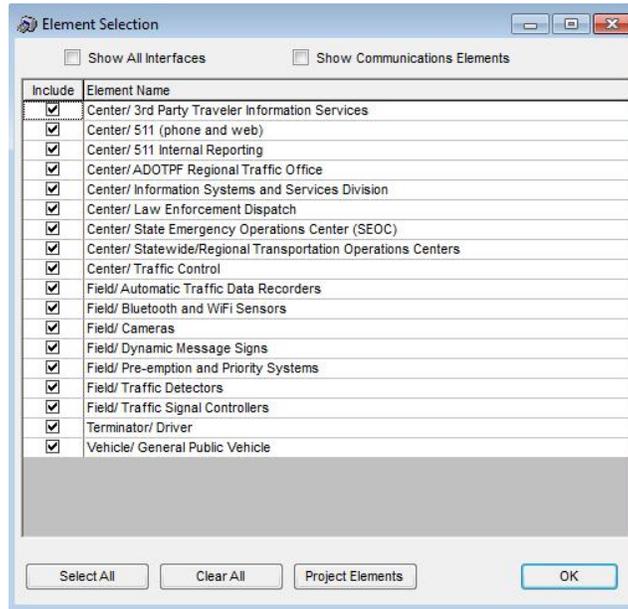
- 3) The **Diagrams window** will pop up. You can create several types of diagrams here. We will focus on the Flow Diagram. To create a Flow diagram for your Service Area, select the **Flow** option under **Diagram Type**:



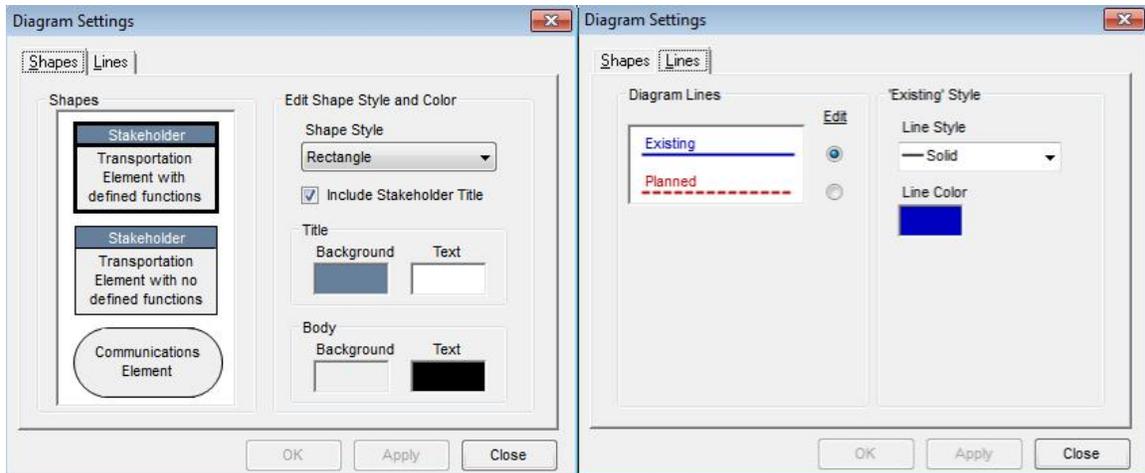
- 4) Once you have selected the Flow option, the other options become available. Most of these other options you won't need to use. If you just want to create a flow diagram for your entire Service Area, skip to **step 5**). There are three main options we can go over:
- Filters:** This option allows for you to change what is shown in your flow diagrams. You filter out your diagram to show different **Entities** (Classes and Types). You can also filter by different **Interconnects**, such as Center to Center connections only. Another option is to only show certain types of **Flows** such as existing or planned only. Finally, you can filter to show only certain **Service Packages**, which won't apply to the AKIA with no Services Packages.



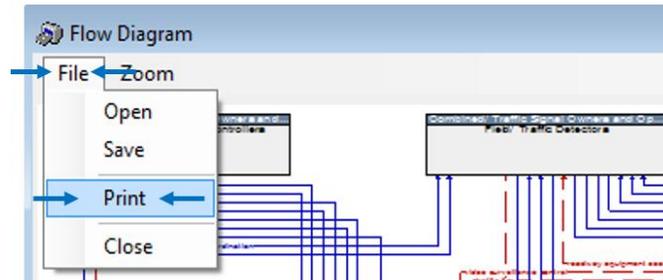
- b. **Elements:** This option is essentially another filter. This allows for you to only show certain elements in your diagram.



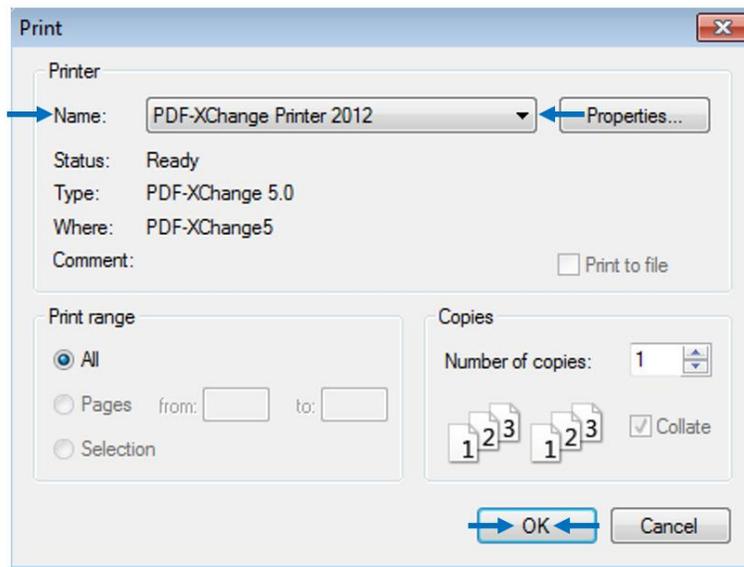
- c. **Settings:** This option allows you to adjust the visuals of your diagram. You can change the shape and color of your elements, stakeholders, and flows. Additionally, you can change the line type of your flows.



- 7) To save/print your flow diagram you can either **Save** your flow diagram (it will generate your flow diagram into an image file) or you can **Print** your flow diagram. If you have a program that can read .PDF files, it is recommended you choose the Print option to both save and print the flow diagram. PDFs are easier to deal with in terms of sharing your diagram and printing. Click on the **File menu** at the top of the screen and then the **Print** option:



- 8) If you have a .PDF viewer that allows you to print to it, it should show up under the Name dropdown menu. Select your .PDF viewer and then click **OK** to save to .PDF:



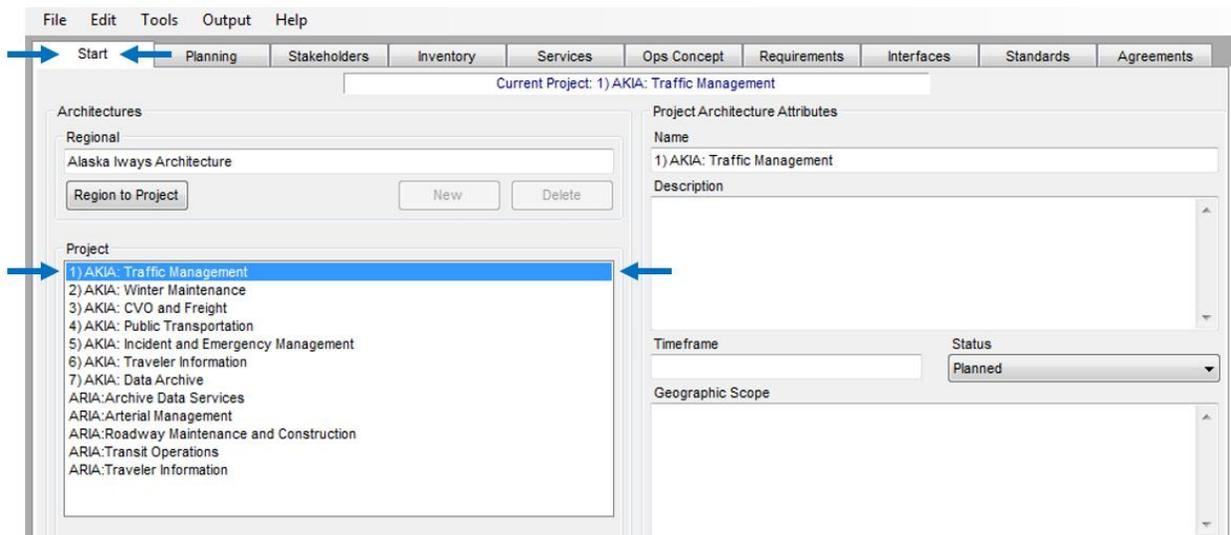
- 9) Finally, name your new .PDF of your flow diagram and save it at your desired location. You now have a .PDF of your flow diagram for easy viewing and sharing.

Accessing Tables

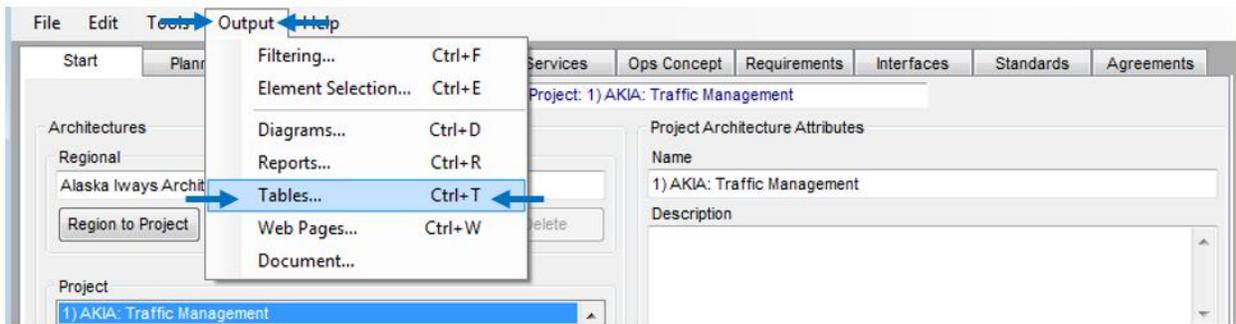
Tables can also be output from the Turbo Architecture software based on the data inputted. To output a table, the user would have to select *Tables* from the *Output* menu. Tables that can be created are listed below with tables included in the architecture in bold:

- Architecture Summary
- Change Log
- Planning
- Stakeholders
- Inventory
- Services
- **Operational Concept**
 - Roles and Responsibilities Tables in Chapter 4
- **Requirements**
 - Functional Requirements Tables in Appendix C
- Interconnects
- **Interfaces**
 - Architecture Flow Tables in Appendix D
- Flow Definitions
- **Standards**
 - Standards Tables in Appendix E
- Standard Group Definitions
- Agreements
- Status Values
- Subsystems and Terminators

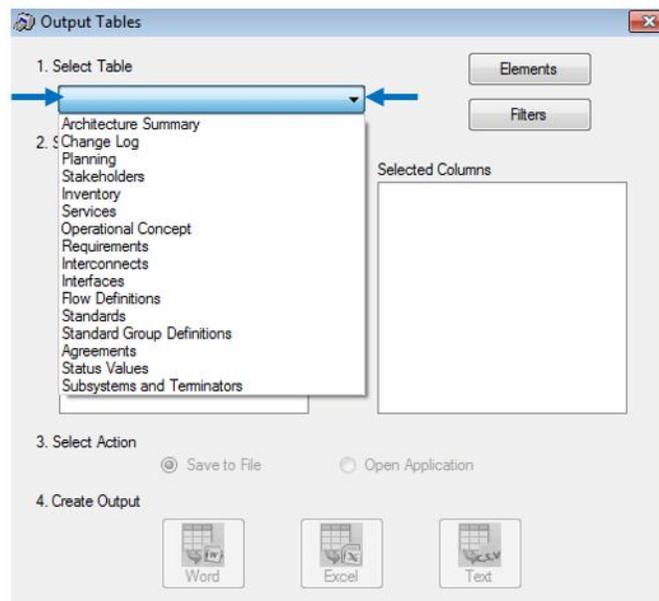
1) In the **Start tab**, select the Service Area you want to create a table for.



- 2) Once the Service Area has been selected, click on the **Output menu**, then click **Tables...**:

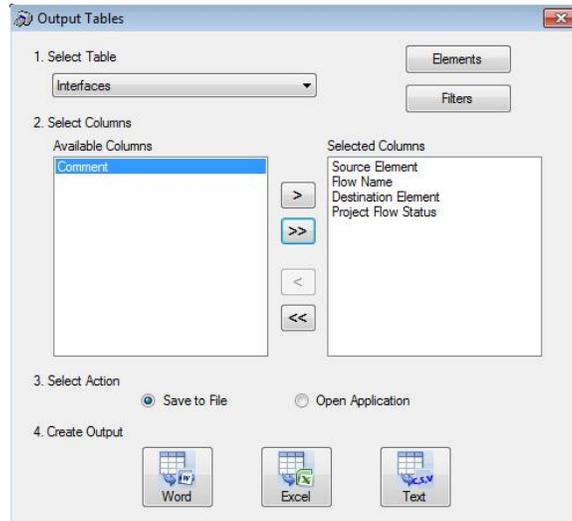


- 3) The **Tables window** will pop up. You can create several types of tables here. Click on the **Select Table dropdown menu** to select the table you want to generate:

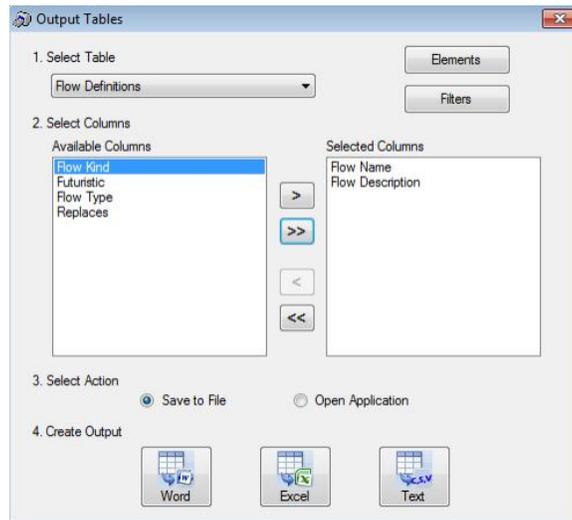


- 4) After selecting the table you want to create, you can choose which columns Turbo will generate for that table. The columns available are unique to each table. We will focus on the tables presented in the AKIA report. Below is the list of tables used in the AKIA report and what is needed to generate them:

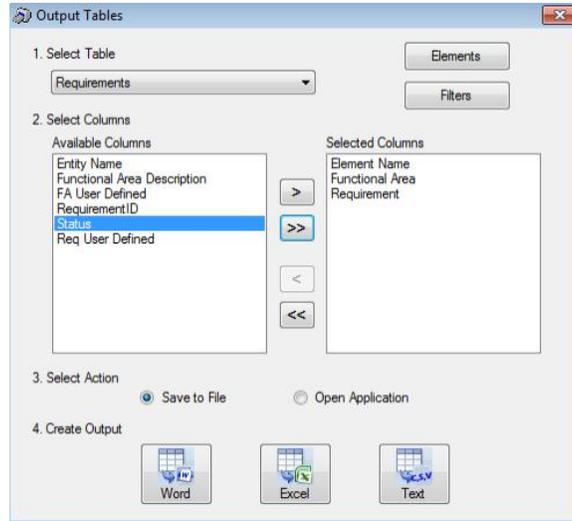
- a. **Architecture Flows Table** (labeled as the **Interfaces** table in Turbo): These tables exist in Appendix D of the AKIA report. These tables summarize all of the flows that is included in your selected Service Area, including the source element, the flow name, the destination element, and the status of that flow. To create this table, you need to have flows “**Included**” in the Interfaces tab. Here are the columns selected to generate the tables in the AKIA:



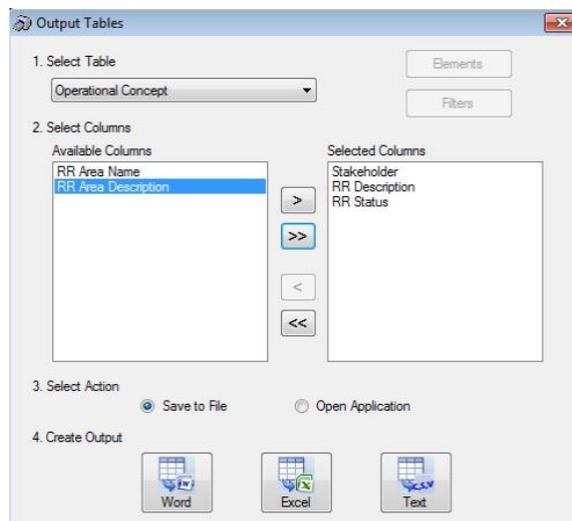
- b. **Flow Definitions Table** (also labeled as **Flow Definitions** table in Turbo): These tables exist in Appendix C of the AKIA report. These tables provide the National ITS Architecture definitions of each flow used in the Service Area. To create this table, you need to have flows “**Included**” in the Interfaces tab. Here are the columns selected to generate the tables in the AKIA:



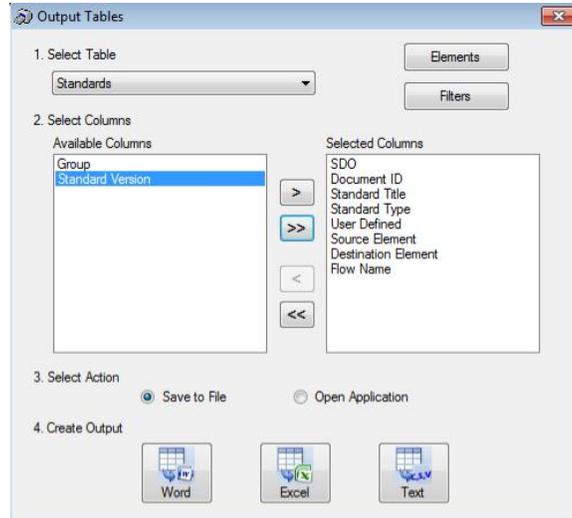
- c. **Functional Requirements Table** (labeled as the **Requirements** table in Turbo): These tables exist in Appendix B of the AKIA report. These tables summarize what each element can do in the Service Area. To create this table, you need to have the Requirements tab completed for the elements in the Service Area. Here are the columns selected to generate the tables in the AKIA:



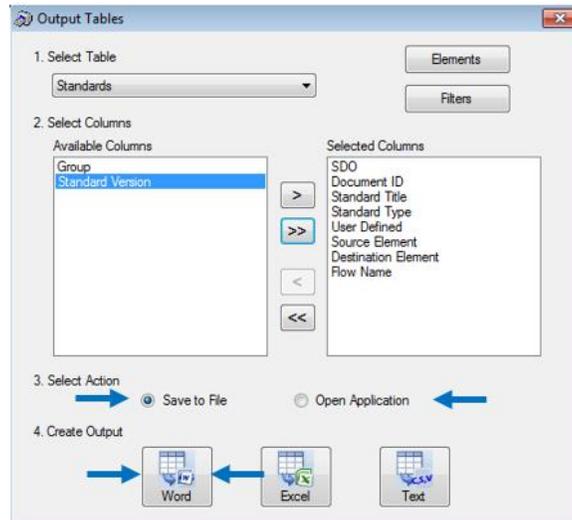
- d. **Roles & Responsibilities Table** (labeled as the **Operational Concept** table in Turbo): These tables exist in Section 4 Operational Concept of the AKIA report. These tables summarize the roles and responsibilities of each stakeholder within the Service Area. To create this table, you need to have the Ops Concept tab completed for the Service Area. These roles and responsibilities are manually entered by the maintainer for each stakeholder in the Ops Concept tab. Here are the columns selected to generate the tables in the AKIA:



- e. **Standards Table** (also labeled as the **Standards** table in Turbo): These tables exist in Appendix E of the AKIA report. These tables summarize the applicable USDOT ITS Standards for each flow in the Service Area. To create this table, you need to have flows “**Included**” in the Interfaces tab. Here are the columns selected to generate the tables in the AKIA:



- 5) Once you have selected the columns for your table, you can select to either **Save to File** or **Open Application**. Select the action you want then click on the type of output you want. You can choose between **Word**, **Excel**, or **Text**. It is recommended that you choose the **Word** output if you are updating the AKIA report. This allows for you to easily copy and paste the tables into the report:



- 6) Once you've clicked on your desired Output, Turbo will either Save your file to a location of your choosing, or open the file based on the type of output you've selected. You have now successfully generated a table.