Turbo Architecture

Overview and User Guide

What is Turbo Architecture?

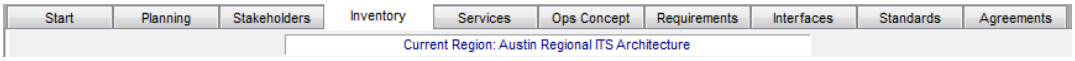
Current Version of Turbo Architecture:

- *Version 7.0*
- *Supports Version 7.0 of the National ITS Architecture*
- *Available as a free download*

Turbo Architecture was developed by the Federal Highway Administration as a tool to document ITS architectures. The primary purpose of the tool is to standardize the format for documenting a regional or statewide ITS architecture and facilitate the identification of applicable ITS standards. This is an important distinction because Turbo Architecture alone will not create a regional ITS architecture. The development of an ITS architecture typically occurs before the Turbo Architecture file is created.

Download from:
www.iteris.com/itsarch/html/turbo/turbomain.htm

Tabs



When Turbo Architecture is opened, the following tabs are located across the top of the window:

Start—summary of the ITS architecture including description, timeframe, geographic scope, service scope and development information. This tab also includes information on any project architectures developed within the regional ITS architecture

Planning—document ITS objectives and strategies (or ITS needs) and associate those strategies with service packages contained in the architecture

Stakeholders—name and description of stakeholder agencies

Inventory—name and description of elements and associated stakeholder, subsystem(s), and element status

Services—instances of service packages, service package status, and selection of associated elements

Ops Concept—documentation of operational roles and responsibilities based on service areas and the status

Requirements—selection of functional areas and associated requirements (“shall” statements)

Interfaces—selection of applicable ITS architecture flows and status

Standards—associated standards for the interfaces that have been selected

Agreements—documentation of existing and potential future agreements to support the sharing of data between agencies

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Getting Started

The highlighted architecture in the Start tab (regional or project architecture) will determine what is shown on subsequent tabs.

Relationship between Regional and Project Architectures:

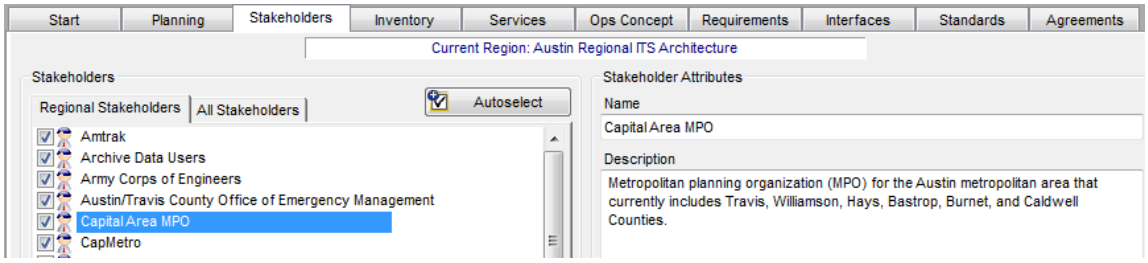
Project architectures, if developed, are a subset of the regional architecture. This feature allows for project specific service package instances and element status and flow status to be documented in Turbo.

Start tab includes:

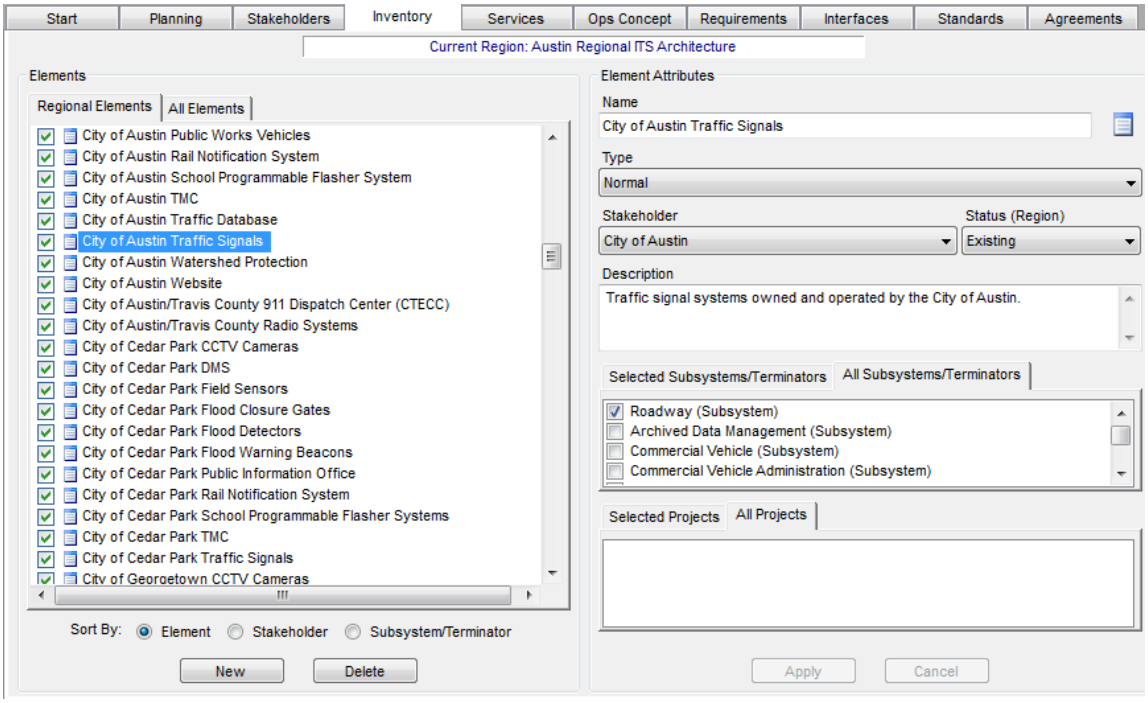
- Architecture Name
- Project Architectures (if applicable)
- Description
- Timeframe
- Geographic Scope
- Service Scope
- Development Information (developer, maintainer, version information and access to change log)

Stakeholders and Inventory

Stakeholders: Stakeholder name and description



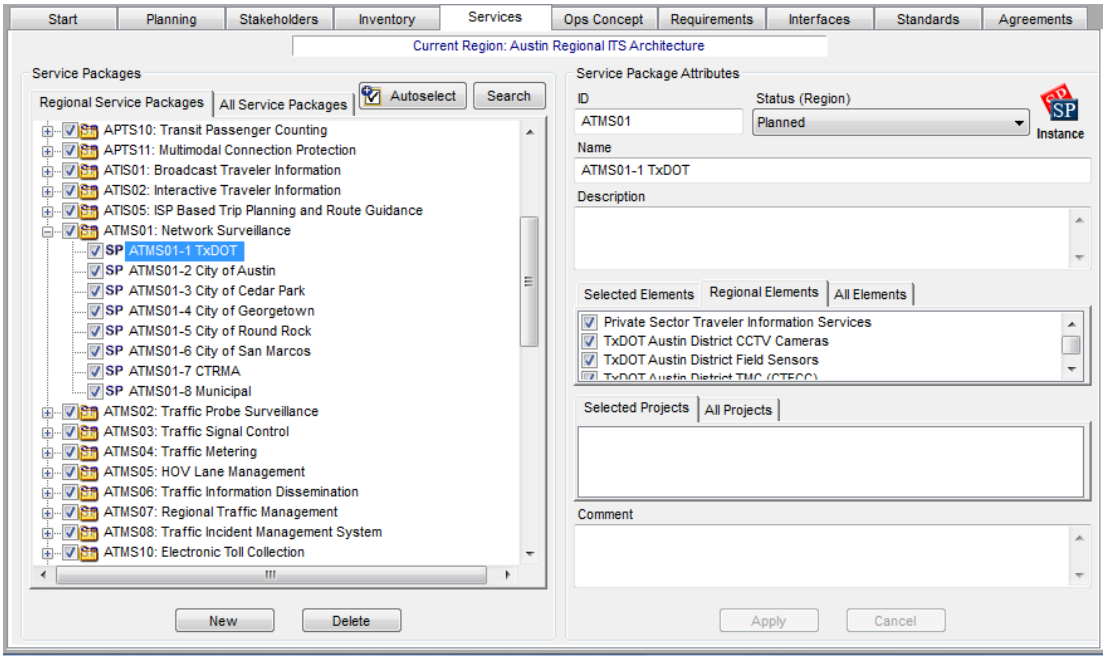
To open a file created in a previous version of Turbo Architecture without converting it to the new version, first open the older version of Turbo and then the file. Otherwise you will be prompted to convert the file to the new version.

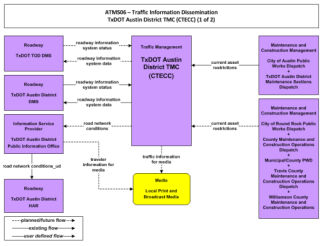


An element can be a member of more than one subsystem.

Services

For each service package diagram developed, a service package instance is entered in the Services tab and the associated elements are selected to that instance of the service package.





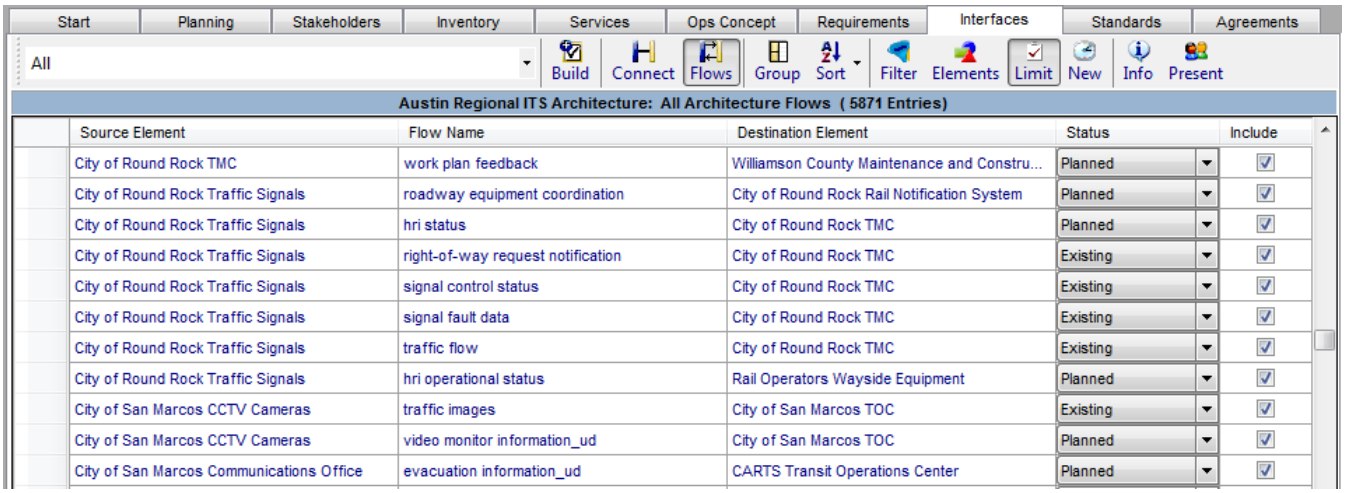
Each service package diagram will have a service package instance in Turbo.

Interfaces

Each time Turbo Architecture is opened, it defaults to the connections settings in the Interfaces tab. Click the flow button to view the flows.

The Interfaces tab is where the selection of flows between elements is made and the flow status is set.

Potential flows between elements are based on element subsystems. If a change is made to the subsystem of an element, a build must be performed before any changes are reflected in the Interfaces tab.



Source Element	Flow Name	Destination Element	Status	Include
City of Round Rock TMC	work plan feedback	Williamson County Maintenance and Constru...	Planned	☑
City of Round Rock Traffic Signals	roadway equipment coordination	City of Round Rock Rail Notification System	Planned	☑
City of Round Rock Traffic Signals	hri status	City of Round Rock TMC	Planned	☑
City of Round Rock Traffic Signals	right-of-way request notification	City of Round Rock TMC	Existing	☑
City of Round Rock Traffic Signals	signal control status	City of Round Rock TMC	Existing	☑
City of Round Rock Traffic Signals	signal fault data	City of Round Rock TMC	Existing	☑
City of Round Rock Traffic Signals	traffic flow	City of Round Rock TMC	Existing	☑
City of Round Rock Traffic Signals	hri operational status	Rail Operators Wayside Equipment	Planned	☑
City of San Marcos CCTV Cameras	traffic images	City of San Marcos TOC	Existing	☑
City of San Marcos CCTV Cameras	video monitor information_ud	City of San Marcos TOC	Planned	☑
City of San Marcos Communications Office	evacuation information_ud	CARTS Transit Operations Center	Planned	☑

Ops Concept, Requirements and Agreements

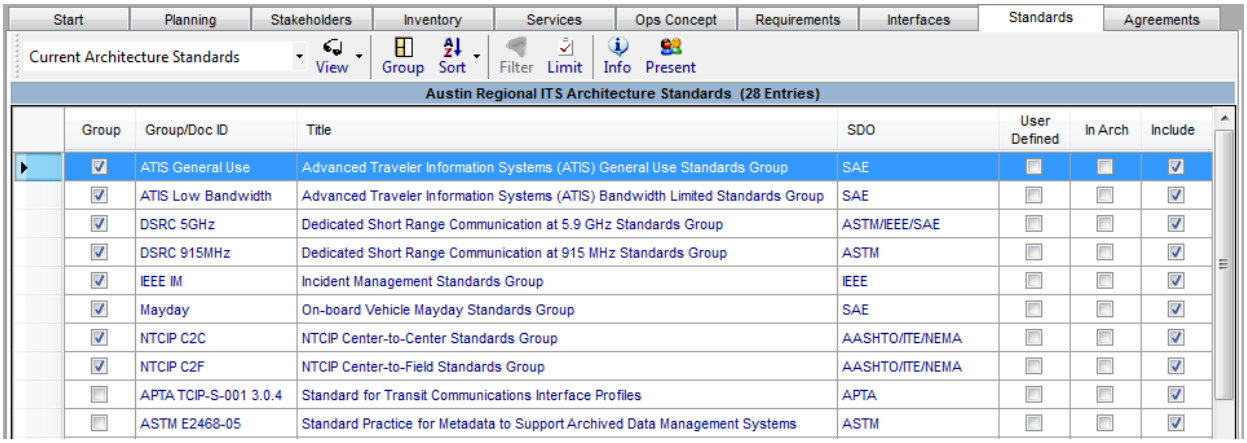
Ops Concept: Operational concepts are developed for each stakeholder and identify the roles and responsibilities of the stakeholders related to a particular service area. Operational concepts are not always documented in Turbo Architecture.

Requirements: Requirements are the specific functions associated with each element to accomplish the desired services. Each functional area has associated requirements ("shall" statements). The auto select function generates requirements based on the inventory and service packages selected.

Agreements: The Agreements tab allows documentation of existing and potential future agreements to support the sharing of data between agencies. Agreements are not always documented in the Turbo Architecture Database.

Standards

Standards are automatically selected based on the flows that have been chosen during the architecture development.

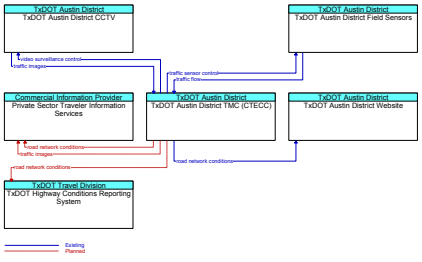


Group	Group/Doc ID	Title	SDO	User Defined	In Arch	Include
☑	ATIS General Use	Advanced Traveler Information Systems (ATIS) General Use Standards Group	SAE	☐	☐	☑
☑	ATIS Low Bandwidth	Advanced Traveler Information Systems (ATIS) Bandwidth Limited Standards Group	SAE	☐	☐	☑
☑	DSRC 5GHz	Dedicated Short Range Communication at 5.9 GHz Standards Group	ASTM/IEEE/SAE	☐	☐	☑
☑	DSRC 915MHz	Dedicated Short Range Communication at 915 MHz Standards Group	ASTM	☐	☐	☑
☑	IEEE IM	Incident Management Standards Group	IEEE	☐	☐	☑
☑	Mayday	On-board Vehicle Mayday Standards Group	SAE	☐	☐	☑
☑	NTCIP C2C	NTCIP Center-to-Center Standards Group	AASHTO/ITE/NEMA	☐	☐	☑
☑	NTCIP C2F	NTCIP Center-to-Field Standards Group	AASHTO/ITE/NEMA	☐	☐	☑
☐	APTA TCIP-S-001 3.0.4	Standard for Transit Communications Interface Profiles	APTA	☐	☐	☑
☐	ASTM E2468-05	Standard Practice for Metadata to Support Archived Data Management Systems	ASTM	☐	☐	☑

Output: Reports and Diagrams

Once an ITS architecture is documented in Turbo Architecture, the software can be used to generate reports and diagrams to facilitate using the architecture. The following table describes several of the most useful reports and diagrams that the software can be used to generate.

Report or Diagram Name	Functions
Stakeholder Report	Description of the stakeholder and associated elements
Inventory Report	Description and status for each element in the architecture
Functional Requirements Report	Identifies the functions areas that have been selected for each element
Database Check Reports	Identifies potential errors related to information inputs and the selections that were made for stakeholders, elements, flows, and status. Various reports can be generated
Standards Activity Report	Identifies relevant standards associated with each of the data flows used in the regional ITS architecture
Subsystem Diagram	Identifies the subsystems from the National ITS Architecture that are included in the regional ITS architecture, otherwise known as the sausage diagram
Interconnect Diagrams	For each element, identifies of the other elements that are connected and the status of each connection. Interconnect Diagrams can be generated to show the relationship between two specific elements, the relationship between one element and all other elements it connects to, or by service package instance
Flow Diagrams	Flow Diagrams are similar to Interconnect Diagrams; however, the actual data flows that are part of each connection between elements are also shown



Flow Diagram

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