Executive Summary

Northeastern Illinois Regional ITS Architecture

Chicago Metropolitan Agency for Planning

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Quality information

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Introduction

The Northeastern Illinois Regional Intelligent Transportation Systems (ITS) Architecture is a roadmap for transportation systems integration for the northeastern Illinois counties of Cook, DuPage, Kane, Kendall, Lake, McHenry, Will and a portion of Grundy County over the next 15 years. The Architecture has been developed through a cooperative effort by the region's transportation agencies, covering all modes and all roads in the region. The Architecture represents a shared vision of how each agency's systems will work together in the future, sharing information and resources to provide a safer, more efficient, and more effective transportation system for travelers in the region.

The Architecture is an important tool that will be used by:

- Operating agencies to recognize and plan for transportation integration opportunities in the region;
- Planning agencies to better reflect integration opportunities and operational needs into the transportation planning process; and
- Other organizations and individuals that use the transportation system in the Northeastern Illinois region.

The Architecture provides an overarching framework that spans all of these organizations and individual transportation projects. Using the Architecture, each transportation project can be viewed as an element of the overall transportation system, providing visibility into the relationship between individual transportation projects and ways to cost-effectively build an integrated intelligent transportation system over time.

Background

In 2001, the U.S. Department of Transportation (U.S. DOT) published the Federal Highway Administration (FHWA) Final Rule and Federal Transit Administration (FTA) Policy which implement section 5206(e) of the Transportation Equity Act for the 21st Century (TEA-21). The rule set out the requirement that regions who were implementing ITS projects must develop an ITS architecture by April 2005.

Fortunately, the Chicago metropolitan area understood early on the value of a plan to guide the development of the region's intelligent transportation systems. In 1999, the Strategic Early Deployment Plan (SEDP) identified the need for a Regional ITS Architecture. A preliminary, high level Architecture of key regional systems was prepared through the Gary-Chicago-Milwaukee Corridor Multi-Modal Traveler Information System (GCM/MMTIS) and is described in the SEDP and in GCM documentation.

In July of 2000, IDOT and Chicago Area Transportation Study (CATS), a predecessor of the Chicago Metropolitan Agency for Planning (CMAP), sponsored a regional Tier 1 Architecture workshop to continue the development of the preliminary regional architecture. This one-day workshop gathered local transportation stakeholders and introduced the basic steps and concepts necessary to continue the development of a Regional ITS Architecture. In March of 2001, the Tier II Architecture workshop was held which incorporated the information from GCM and SEDP documentation, and stakeholder input into the first Regional ITS Architecture for northeastern Illinois – well in advance of the deadline set out by U.S. DOT for this task. This Regional ITS Architecture was built using the Turbo Architecture© tool. The resulting 2002 Regional ITS Architecture v1.0 was found to be consistent with the National ITS Architecture by the FHWA and FTA in June of 2003.

In 2007, another major update to the base Regional ITS Architecture was undertaken. Over a period of two days, half-day stakeholder meetings were held with groups of stakeholders from the region's agencies representing:

- Emergency Management and Security Functions
- Arterial Management Functions
- Expressway Management Functions
- Transit Management Functions

The stakeholders had a chance to review information included in the Northeastern Illinois Regional ITS Architecture v1.0 and participate in discussions guided by consultants regarding ITS activities. In addition to stakeholder input, ITS documents from a variety of agencies were reviewed with information incorporated into the revised Regional ITS Architecture. The results of the document review and outreach produced the Northeastern Illinois Regional ITS Architecture v2.0, adopted in early 2008.

After an information gathering process which extended from spring of 2013 until the middle of 2014, an updated Regional ITS Architecture v.3.0 was developed. The CMAP Board and MPO Policy Committees approved the updated architecture at their respective January 2015 meetings.

On December 4, 2015, President Obama signed into law H.R. 22, the Fixing America's Surface Transportation (FAST) Act. The bill retained funding for research in Intelligent Transportation Systems and also reiterated the requirement that ITS projects carried out with funding from the Highway Trust Fund must conform to the appropriate regional ITS architecture.

In 2019, CMAP began an outreach process with the Transportation Technology and Operations Coalition (TTOC) agency members to collect information on desired revisions to the CMAP project architectures within the overall Regional ITS Architecture. Information collection took place during interviews with regional stakeholder agencies between May and September 2019, and agencies were free to invite additional participants who could add information to the conversation. The meetings focused on a review of each agency's project ITS architectures developed as part of the Regional ITS Architecture. Updates were made in 2020 based on the input gathered from these stakeholder meetings. In addition, a Northeastern Illinois Regional ITS Architecture Change Request Form was developed to provide CMAP with a consistent form that could be used to gather ITS project updates from member agencies.

In 2022, CMAP project staff attended a number of virtual training sessions to review how the CMAP Regional ITS Architecture could be updated through the addition of information gathered from regional stakeholders over time. Training sessions covered the addition of new project-level ITS architectures and how to make updates through use of existing ITS architecture software.

ARC-IT and RAD-IT Versions

In July 2017, the USDOT released the Architecture Reference for Cooperative and Intelligent Transportation (ARC-IT), which has since been updated to version 9.3 as of 2025, to replace the prior version of the National ITS Architecture. A companion software database tool, known as Regional Architecture Development for Intelligent Transportation (RAD-IT) software, has also been updated to maintain consistency with the ARC-IT Version 9.3.

CMAP Regional ITS Architecture Information Update to Version 5.0

A spreadsheet table of existing and planned project level ITS architectures from the most recent version of the CMAP Regional ITS Architecture was shared with agencies as part of a Transportation Technology and Operations Coalition (TTOC) group meeting in November 2025. Agencies were requested to review ITS project architectures that were assigned to them as stakeholders in the Regional ITS Architecture and to provide feedback electronically within the spreadsheet. This allowed agencies to share the spreadsheet with multiple staff within their agency who could provide updates on the status and description of existing and planned ITS projects.

Agencies providing direct feedback electronically on the spreadsheet include the following:

- City of Chicago Department of Transportation
- Cook County Department of Transportation and Highways
- DuPage County Department of Transportation
- Kane County Department of Transportation
- Lake County Department of Transportation
- City of Naperville Transportation, Engineering and Development (TED)
- Regional Transportation Authority

The Architecture update team also conducted virtual meetings with a number of key agencies in the region as shown in Table 1. The meetings focused on a review of each agency's project ITS architectures developed as part of the Regional ITS Architecture. The spreadsheet table previously shared with the larger group of TTOC agency members was used to review project architectures and gather comments on what could be updated by the project team. New project architectures were also proposed during these virtual meetings for various ongoing projects and these were reflected in the notes taken.

Table 1 – Summary of Virtual Stakeholder Agency Meetings on Project Architectures

Regional Agency	Meeting Date	Agency Contacts
Illinois Tollway	January 20th, 2026	Robert Glaz, Elyse Morgan, Khalid Menawi
CDOT	January 22nd, 2026	Abraham Emmanuel, Matthew Pitts
IDOT	Feb. 4th, 2026	Pete Stresino, Kevin Price, Jonathan Lloyd
Pace, CTA, Metra, and RTA	Feb. 4th, 2026	Taqhi Mohammed (Pace), Angela Ng (CTA), Jeffrey Brantz (Metra), Mark Pitstick (RTA)

Additional information on ITS projects was also gathered from the Will County ITS Opportunities Plan, which included several Northeastern Illinois Regional ITS Architecture Change Request Forms that were completed prior to agency outreach on this project. Once all agency interviews were completed, changes were made to the CMAP Regional ITS Architecture and a brief update of changes made were saved in the project spreadsheet that was previously shared with regional agencies. All information was added to the revised RAD-IT Architecture Database and exported to a revised web-based presentation, with the process being documented in this Regional ITS Architecture v.5.

Status Categories

Throughout the Regional ITS Architecture, inventory, services, interfaces, agreements, and projects are assigned a status of existing, planned, or potential.

An item is **planned** if the region has invested some efforts or funds on the item and intends to implement it at some point. For example, a traffic management center where a planning study has occurred but which none of the further work to implement it has taken place is defined as planned. An item may still be defined as planned when there is a demonstration project or a small amount of the system in place.

An item is **existing** if the item is in place and operating. The item does not have to be in place systemwide or for all stakeholders. For items which are partially in place, the boundary between whether it is planned or existing is fuzzy. How much should be in place to qualify as existing? The decision to categorize as planned or existing was determined based on the stakeholder conversation.

An item is **potential** if the region believes it is valuable and will likely come into existence one day, but nothing has been invested in developing it yet.

Stakeholder Update

Stakeholder coordination and involvement are key elements for developing a Regional ITS Architecture. The stakeholders have been identified and described with enough detail that a project developer can understand who the stakeholders are and what activities they are responsible for. The web-based presentation conveniently provides a list of elements associated with the stakeholder directly from the stakeholder list. The stakeholders represent a mix of specific agencies or organizations and generic names used to represent groups of stakeholders. Examples of specific agency or organizations are Metra and the Illinois Tollway. An example of a generic stakeholder group name is Municipalities / Townships, which represents any of the municipalities in the region that have ITS elements.

Updates to the stakeholder list for v5.0 of the Regional ITS Architecture include the following:

- Updated name and description of Regional Transportation Authority (RTA) to reflect the new Northern Illinois Transit Authority (NITA) agency that will replace the RTA. Given the transition taking place over the coming years, the name was updated to RTA / NITA.

Web-Based Presentation Stakeholder List

Inventory

The inventory, viewable either by stakeholder or physical object, provides a list of the ITS systems and equipment in the region along with some statewide elements and even some elements of adjoining states (Indiana and Wisconsin). The majority of elements in the inventory represent a specific existing or planned system. Examples of specific systems are the IDOT District 1 ComCenter and the Chicago Transit Authority Control Center.

Some elements represent sets of devices, rather than a single specific system or device. An example of this type of element is the element “City of Chicago Office of Emergency Management and Communications (OEMC) Field Equipment.” This element represents all of the traffic signals, traffic detectors, Closed Circuit Television (CCTV), Dynamic Message Signs (DMS) and Highway Advisory Radio (HAR) that are or will be operated by the City of Chicago OEMC. The element describes the type of devices, not the specific numbers of devices. For example, the element calls out DMS, but does not say how many there are, or their precise location.

A third type of element in the inventory is a “generic” element that represents all of the systems of a certain type in the region. An example of this type of element is the Municipal Public Safety Dispatch, which represents the many municipal public safety answering points (PSAPs) in the region. There are multiple PSAPs in the region. Including these systems using a single element helps keep the Architecture from growing too large.

Each inventory element includes a link to the associated stakeholder, a description of the functionality the item is intended to provide, a context diagram presenting interfaces to all other inventory elements, and individual flow diagrams for interfaces to other elements. The individual flow information defines the flows and links to the applicable ITS standards.

Some highlights of changes to the inventory include:

- Updates of elements assigned to the RTA as RTA / NITA in the architecture.
- Addition of Will County ITS elements to reflect inputs provided from Will County regarding new project-level architectures.

View the ITS Architecture's inventory here.

Needs and Services

The transportation needs for the region are defined as part of the transportation planning process. ON TO 2050, the region’s comprehensive plan, emphasized three principles that relate to improving mobility within the region:

1. Promoting inclusive growth by improving mobility options that spur economic opportunity for low-income communities, people of color, and people with disabilities;
2. Improve resilience by ensuring that infrastructure can adapt to changes in climate and technology; and
3. Prioritize investment of limited resources to efficiently maintain existing infrastructure while securing new revenues for needed enhancements.

Based upon these principles, ON TO 2050 provides a series of recommendations and related strategies / actions to implement the recommendations.

ON TO 2050 Recommendation: Harness technology to improve travel and anticipate future impacts

The related strategies and actions to implement this recommendation include, but are not limited to, coordinating traffic operations region-wide, making a regional priority of data collection, sharing, and analysis of transportation data, and identify public investments that could catalyze emerging technologies.

Example service packages that support these regionally significant projects include:

- Electronic Toll Collection
- Variable Speed Limits
- Dynamic Lane Management and Shoulder Use

ON TO 2050 Recommendation: Make transit more competitive

The related strategies and actions to implement this recommendation include, but are not limited to, investing in and protecting transit's core strengths, encouraging roadway agencies to prioritize improving transit service, and making further progress in fare and service coordination.

Example service packages that support these goals are:

- Transit Vehicle Tracking
- Transit Fixed Route Operations
- Transit Fare Collection Management
- Transit Fleet Management
- Transit Traveler Information
- Transit Signal Priority
- Integrated Multi-Modal Electronic Payment

ON TO 2050 Recommendation: Maintain the region's status as North America's freight hub

The related strategies and actions to implement this recommendation include, but are not limited to, investing strategically in the freight network, improving local and regional truck travel, and mitigating the negative impacts of freight on adjacent areas, particularly Economically Disconnected Areas.

Example service packages that support these goals are:

- Advanced Railroad Grade Crossing
- Freight Electronic Clearance
- Roadside CVO Safety
- Parking Facility Management
- Railroad Operations Coordination

ON TO 2050 Recommendation: Leverage the transportation network to promote inclusive growth

The related strategies and actions to implement this recommendation include, but are not limited to, improving commute options between disinvested areas and employment, education and training, and service opportunities, as well as improving access to public rights of way for pedestrians, cyclists, seniors, and people with disabilities.

Example service packages that support these goals are:

- Broadcast Traveler Information
- Personalized Traveler Information
- Dynamic Ridesharing and Shared Use Transportation
- Dynamic Roadway Warning

ON TO 2050 Recommendation: Improve travel safety

The related strategies and actions to implement this recommendation include, but are not limited to, improving incident detection and management and expanding regional data collection and analysis on safety to support programming decisions.

Example service packages that support these goals are:

- Transportation Infrastructure Protection
- Intersection Safety Warning and Collision Avoidance
- Traffic Incident Management System
- ITS Data Warehouse

ON TO 2050 Recommendation: Improve resilience of the transportation network to weather events and climate change

The related strategies and actions to implement this recommendation include, but are not limited to, adapting vulnerable transportation infrastructure to be responsive to weather events and climate change as well as improving the operational response to weather events to ensure mobility.

Example service packages that support these goals are:

- Weather Data Collection
- Weather Information Processing and Distribution
- Winter Maintenance
- Infrastructure Monitoring

ON TO 2050 Recommendation: Fully fund the region's transportation system

The related strategies and actions to implement this recommendation include, but are not limited to, expanding priced parking, implementing tolling, and using public-private partnerships strategically.

Example service packages that support these regionally significant projects include:

- Electronic Toll Collection
- Parking Space Management
- Parking Electronic Payment
- Parking Reservations

ON TO 2050 Recommendation: Enhance the region's approach to transportation programming

The related strategies and actions to implement this recommendation include, but are not limited to, implementing performance-based programming region-wide and expanding asset management practices to the entire transportation system.

Example service packages that support these regionally significant projects include:

- ITS Data Warehouse

ON TO 2050 Recommendation: Build regionally significant projects

ON TO 2050 recommends building regionally significant projects as major capital projects in the region. Some of the new major capital projects are recommended to include managed lanes. While not specifically mentioned, all new major capital projects will include significant ITS components.

Example service packages that support these regionally significant projects include:

- Electronic Toll Collection
- Variable Speed Limits
- Dynamic Lane Management and Shoulder Use
- Dynamic Roadway Warning
- VMT Road User Payment
- Transportation Decision Support and Demand Management

Operational Concept

An operational concept documents each stakeholder's current and future roles and responsibilities in the operation of the regional ITS systems. The operational concept documents these roles and responsibilities across a range of transportation services. Agency responsibilities in the following areas have been defined.

- Archived Data Systems
- Commercial Vehicle Operations
- Electronic Toll Collection
- Emergency Management
- Freeway Management
- Incident Management
- Maintenance and Construction
- Parking Management
- Road User Payment
- Surface Street Management
- Transit Services
- Traveler Information

View the ITS Architecture's concept of operations by clicking here.

Interfaces and Information Exchanges

While it is important to identify the various systems and stakeholders as part of a Regional ITS Architecture, a primary purpose of the Architecture is to identify the *connectivity* between transportation systems in the region and where appropriate, outside the region. How these systems interface with each other is an integral part of the overall Architecture. These interactions are referred to as interfaces and are listed in the web-based presentation. The elements are listed alphabetically in the column on the left, and each entry in the Interfacing Element column on the right is a link to more detailed information about the particular interface.

There are 346 different elements identified as part of the Northeastern Illinois Regional ITS Architecture. These elements include city, county and state traffic operations centers, transit centers, transit vehicles, public safety dispatch centers, media outlets, and others—essentially all of the existing and planned physical components that contribute to the regional intelligent transportation system. Interfaces have been defined for each element in the Architecture. For example, the IDOT District 1 Traffic Systems Center (TSC) has existing or planned interfaces with many other elements in the region ranging from field equipment to transit centers. Some of the interfaces are far less complex. For example, the City of Chicago Skyway Roadside Equipment has interfaces with only two other elements in the Architecture.

Architecture flows between the elements define specific information that is exchanged by the elements. Each architecture flow has a direction, name and definition. Most of the architecture flows match ones from ARC-IT (the mapping of elements to ARC-IT entities allowed the developers to match the architecture flows to the appropriate interfaces). In some cases, new user defined flows have been created for interfaces or connections that are not expressed in ARC-IT. These architecture flows define the interface requirements between the various elements in the Regional Architecture.

View the ITS Architecture's interfaces and information exchange by clicking here

Functional Requirements

Functional requirements are a description of the functions or activities that are currently performed by the ITS elements or that are planned to be performed in the future. The information describes what the systems are supposed to do. The Northeastern Illinois Regional ITS Architecture functions were developed using the functional assignments underlying ARC-IT and the mapping from transportation services to elements. The functions are easily understood and are presented as a list of “shall” statements.

View the ITS Architecture’s functional requirements by clicking here.

Regional Projects and Project Sequencing

One focus of this update was to collect more information about ongoing projects. Because of this, the project list changed more than anything else in the Architecture.

The projects listed in the Architecture provide a way to learn about specific ITS development activities. The Northeastern Illinois Regional ITS Architecture views the project entry as reflective of the process which takes place to:

- **Expand an existing inventory**
  For example, an agency may have traffic surveillance equipment on parts of its system. The inventory items will reflect that the agency owns such equipment. If the equipment is being expanded onto another roadway, a project is included to reflect the expansion on that roadway.
- **Develop a new inventory item**
  An agency may begin the process to develop a truck parking information system. A project will then be added that reflects the activity of building a truck parking system, while the inventory will be updated to reflect the existence of a planned truck parking system belonging to the agency.
- **Link the inventory items in a new way to achieve a goal**
  The work to develop the links between inventory items is reflected as a project. For example, the

region has 911 call centers, and the region has traffic management centers. The region has identified the flow of incident information to traffic management centers as an important goal. A project has been added that reflects the activity of establishing communication between those systems.

Project sequencing is addressed in general terms. Projects are defined as short-term (0-5 years), mid-term (5-10 years), and long-term projects (10-15 years).

Table 2 below lists a summary of major updates to project architectures made to the Architecture during this update. A complete listing of changes to each project architecture has been maintained in the Excel spreadsheet that was shared with regional stakeholder agencies during individual agency meetings.

Table 2 – Summary of Updates to Project ITS Architectures by Agency

Stakeholder Agency	Updates to Project Architectures Made Based on Agency Input
City of Chicago Department of Transportation	Twelve (12) project architectures updated. These upgrades include camera system upgrades, additional federal grants, new features & functionality to CDOT TMC, inclusion of e-bikes & e-scooters, and addition of ICM strategies for Adaptive Signal Control. Additionally, a new project architecture added related to Chicago Centralized Transit Signal Priority (CCTSP)
Cook County Department of Transportation and Highways	Four (4) project architectures updated. These updates are based on stakeholders' input on the current status of the projects and status of data flow in service packages.
Chicago Transit Authority	Two (2) project architectures updated. These updates include updating the description of CTA Bus Rapid Transit ongoing studies and deployments, as well as a new project architecture added for CTA Transit Signal Priority.
DuPage County Department of Transportation	Seven (7) project architectures updated. These updates include the completion of the upgrade to the current ATMS System, upgrades to signal timings & traffic signal system, installation & integration of PTZ cameras. Additionally, some project statuses changed to 'potential'.
Illinois Department of Transportation	Twelve (12) project architectures updated. These updates include changes to project status, upgrades to project description based on stakeholders' comments and changes to project titles. These updates also include video data sharing with local media & connection with neighboring systems, development of arterial traffic management system with fiber installation as first major step and updates to Smart Work Zones.
Illinois Tollway	Thirteen (13) project architectures updated. These updates include changes to project status, upgrades to project description based on stakeholders' comments and changes to project titles. Additionally, the updates include annual evaluation & addition of LED DMSs, upgrades to truck parking facilities, expansion of pace bus shoulder usage along Tri-State Tollway, increased accuracy of travel time data, existing & new RWIS integration into TIMS, various upgrades to TIMS interface and Electronic Tolling & RFID tags.

Stakeholder Agency	Updates to Project Architectures Made Based on Agency Input
Kane County Department of Transportation	Three (3) project architectures updated. These updates include the addition of services and/or modules to the county ATMS software, and the addition of two new project architectures.
Lake County Department of Transportation	Five (5) project architectures updated. These updates include change of project status to existing, replacement of the existing adaptive signal system, additional plans for V2X applications, addition of phone application & website for highway alerts and expansion of existing communication network & connection with LCDOT TMC.
Metra	Three (3) project architectures updated. These updates include upgrades to tracking details to Metra vehicles & the addition of scheduling software, next phase for Ticket Vending Machine expansion and updated timeline for VIDS expansion.
Pace Suburban Bus Service	Four (4) project architectures updated. These updates include expansion to the usage of the mobile application, expansion to the on-demand service area, updates to the Queue Jump System, planned centralized TSP operations, additional pace corridors and updates to the system flow of various projects.
RTA / NITA	Two (2) project architectures updated. These updates include inclusion of the new Northern Illinois Transit Authority (NITA), web-based trip planning & vehicle arrival information, and dissemination of transit information to Gateway and service boards.

Reasonable attempts were made to ensure that the project architecture components (inventory, service packages, and data flows) made sense. However, we acknowledge these items will undergo closer scrutiny and require refinement as projects get underway. We expect that corrections to the project Architectures will be made as they are identified during project development.

View the ITS Architecture project listing by clicking here.

Agreements

There are several types of arrangements associated with the interfaces included with the projects discussed previously. Data exchanges between systems require agreements on the transmission protocol and data formats to ensure compatibility. Coordinating field device operations owned by different agencies requires defined procedures for submitting message requests and rules governing when such requests can be honored. Such coordination can be accomplished either with handshake agreements or formal written instruments. Sharing control of field devices operated by different agencies involves more liability issues, which requires more formal agreements. Coordinated incident response may also require formal agreements, but also requires group training of personnel from various agencies. While all interfaces involve agreements for data compatibility, agreements for procedures and operations as well as training can also be critical elements to optimizing the benefits of the Architecture.

View the ITS Architecture agreements by clicking here.

Standards

ITS standards establish a common way in which devices connect and communicate with one another. This allows transportation agencies to implement systems that cost-effectively exchange data and accommodate equipment replacement, system upgrades, and system expansion. Standards benefit the traveling public by providing products that will function consistently and reliably throughout the region. ITS standards contribute to a safer and more efficient transportation system, facilitate regional interoperability, and promote an innovative and competitive market for transportation products and services.

Standards are developed by a number of standards development organizations:

- American Association of State Highway and Transportation Officials (AASHTO)
- American National Standards Institute (ANSI)
- American Society for Testing and Materials (ASTM)
- Electronic Industries Alliance/Consumer Electronic Association (EIA/CEA)
- Institute of Electrical and Electronics Engineers (IEEE)
- Institute of Transportation Engineers (ITE)
- Society of Automotive Engineers (SAE)
- American Public Transportation Association (APTA)
- National Electrical Manufacturers Association (NEMA)

Use of ITS standards is very important to project development in the northeastern Illinois region. These standards apply to many areas including center-to-center, center-to-roadside, center-to-vehicle/traveler, roadside-to-roadside, and roadside-to-vehicle. Based on the interfaces and information flows chosen for the Regional Architecture, a number of ITS standards are applicable to the region. Each information flow is associated with a standard. However, the Regional ITS Architecture does not link directly to details on the applicable standards, but simply lists the relevant standards leaving project developers to find the detailed information on their own. The USDOT Research and Innovative Technology Administration ITS Joint Program Office ITS Standards Program is a good place to start.

A specific plan for how the region will consider standards has not been developed, but the Regional Transit Signal Priority Working Group, hosted by the Regional Transportation Authority, provides a good example for how that process might be carried out. This group has developed regional standards for an interoperable system which includes bus equipment from two different transit agencies (Pace and CTA) and roadside equipment owned and operated by city, county and state transportation departments. The group is working cooperatively with all stakeholders involved to implement a regionally interoperable transit signal priority system through use of these standards.

View the ITS Architecture standards by clicking here.

Using the Regional ITS Architecture

Once a regional ITS architecture has been created, it is important that it be used as a key reference in the transportation planning process. This will enable all proposed ITS projects to be consistent with the Regional ITS Architecture and promote the consideration of additional integration opportunities, leading to more efficient implementations.

The Regional ITS Architecture should also be considered for support in the ITS project development cycle. This begins with project definition, followed by procurement, leading to implementation. Information in the Regional ITS Architecture can assist in all three of these areas of project development.

Project Definition may occur at several levels of detail. Early in the planning process, a project may be defined only in terms of the transportation services it will provide, or by the major system pieces it contains. At some point prior to the beginning of implementation, the details of the project must be developed. This could include further system definition and interface definition including exactly what systems or parts of systems will make up the project, what interconnections the project entails, and what information needs to flow across the system interconnections. Requirements definition may go through similar levels of detail, starting with a very high level description of project functions and moving toward system specifications. By identifying the portions of the Regional ITS Architecture that define the project, the Regional ITS Architecture outputs can be used to create key aspects of the project definition.

The areas that a Regional ITS Architecture can assist in project definition are:

- The identification of agency roles and responsibilities (including any interagency cooperation) that can come from the operational concept developed as part of the Regional ITS Architecture. This operational concept can either serve as a starting point for a more detailed definition, or possibly provide all the needed information.
- Requirements definition can be completely or partly defined by using the Regional ITS Architecture functional requirements applicable to the project.
- The Regional ITS Architecture includes a map to ITS standards and the project mapping to the Regional ITS Architecture can extract the applicable ITS standards for the project.

Procurement can commence once a project is defined, and funding for it is committed. This generally begins with the development of a Request for Proposal (RFP), which is the common governmental practice for initiating a contract with the private sector to implement the project.

The Regional ITS Architecture can support RFP development. First, the project definition described above forms the basis for what is being procured. Mapping the project to the Regional ITS Architecture allows bidders to have a clear understanding of the scope of the project and of the interfaces that need to be developed. The functional requirements created as part of the Regional ITS Architecture can be used to describe the functional requirements for the project. In addition, a subset of the ITS Standards identified as part of the Regional ITS Architecture development can be specified in the RFP.

Project Implementation begins once a contract is in place. Implementation moves through design, development, integration, and testing.

Because ITS projects involve systems and their interconnections, it is very important to follow a system engineering approach to designing and implementing the project. While the exact process followed is at the discretion of the local agency, the ITS Architecture and Standards Rule/Policy lay out a set of required system engineering analyses for ITS projects funded through the Highway Trust Fund.

The required systems engineering analysis steps are:

- Identification of portions of the Regional ITS Architecture being implemented (or if a Regional ITS Architecture does not exist, the applicable portions of ARC-IT)
- Identification of participating agencies' roles and responsibilities
- Requirements definitions
- Analysis of alternative system configurations and technology options to meet requirements
- Procurement options
- Identification of applicable ITS standards and testing procedures
- Procedures and resources necessary for operations and management of the system

The Regional ITS Architecture can provide inputs to a number of these steps as shown in

Table 3 below.

Table 3 – Summary of Systems Engineering Requirements and ITS Architecture Outputs

System Engineering Requirements	Regional ITS Architecture Output
Identification of portions of the regional ITS Architecture being implemented	Mapping project to the elements and interfaces of the regional ITS Architecture.
Identification of participating agencies' roles and responsibilities	Use Operational Concept as a starting point.
Requirements definitions	Use Functional Requirements as a starting point.
Identification of applicable ITS standards and testing procedures	Use Regional Architecture standards outputs as a starting point for the standards definition.

The Regional ITS Architecture represents a detailed plan for the evolution of the ITS systems in the region and can be used to support regional transportation planning efforts and project development efforts.