# Introduction

The Northeastern Illinois Regional Intelligent Transportation Systems (ITS) Architecture is a roadmap for transportation systems integration in the seven county (Cook, DuPage, Kane, Kendall, Lake, McHenry, Will, and a portion of Grundy) Northeastern Illinois region 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.
* 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.

The Architecture was developed in cooperation with the Illinois Department of Transportation and recognizes linkages to the [Illinois Statewide ITS Architecture](http://www.dot.il.gov/ilits/documents/IL%20SW%20ITS%20Architecture%20Document%201.0.pdf). The Architecture also supports information flows to the neighboring states of [Wisconsin](http://www.topslab.wisc.edu/its/architecture/) and [Indiana](http://www.in.gov/indot/files/TMC_TrafficManagementStrategicPlan_v2-4.pdf), who maintain their own Statewide ITS Architectures. Within the region, DuPage County has adopted the [DuPage County Transportation Coordination Initiative](https://www.dupageco.org/DOT/1573/) a subregional ITS architecture whose activities are also supported and included within the Regional ITS Architecture.

# Background

In 2001, the US Department of Transportation published the FHWA Final Rule and 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, the Illinois Department of Transportation (IDOT) and Chicago Area Transportation Study (CATS), now known as the Chicago Metropolitan Agency for Planning, 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 Turbo Architecture © based Regional ITS Architecture for northeastern Illinois – well in advance of the deadline set out by USDOT for this task. 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, and
* 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.

# National ITS Architecture and Turbo Architecture © Versions

The National ITS Architecture has been updated to version 7. The Turbo Architecture © database software has been updated to maintain consistency with the National ITS Architecture, and also skipping from version name 5.0 to version name 7.0 to maintain naming consistency with the National Architecture version name. The first step of updating the Regional ITS Architecture was to update the 2007/2008 northeastern Illinois ITS Architecture from Turbo Architecture © 4.0 to Turbo Architecture © 7.0. This update resulted in a Regional ITS Architecture that is consistent with the current National ITS Architecture v7, which defines the functions that are required for ITS, the physical systems which supply them, and the information exchanges that connect the physical subsystems together into an integrated system.

# Regional ITS Architecture Information Update

At the conclusion of the 2008 update, CMAP adopted a maintenance plan that called for a more continuous rather than periodic maintenance process based on information collected at regular meetings of the ATTF. The maintenance tasks could be either supported by consultants, as all updates had been in the past, or staff could take advantage of training provided by FHWA and develop the skills to maintain the ITS Architecture in-house. In the years that followed, CMAP staff availed themselves of this training. Time passed, however, and the continuous update model was not followed. In addition to the passing of time triggering the need for an update, the region approved its first regional comprehensive plan, GO TO 2040, which included a number of projects, action areas, and policies which are highly dependent on the region’s ITS infrastructure and which were not reflected in the Regional ITS Architecture. Therefore, in spring 2013 CMAP began an outreach process with ATTF members to collect information on desired Architecture revisions.

Information collection took place during interviews with stakeholder agencies, with two rounds of interviews being held. The first round of interviews took place in early 2013. The meetings were scheduled with individual ATTF members, who were free to invite additional participants who could add information to the conversation. CMAP traveled to the agency location, and in most cases the meetings were attended by multiple agency representatives. Prior to the meetings, CMAP staff developed review material consisting of reports generated from the Regional ITS Architecture for reference during the interviews. The material presented the current inventory items by stakeholder, project Architectures, and agreements listing. CMAP staff took notes during the wide-ranging conversation, focusing on Architecture items that should be changed or added.

**Spring 2013 in-person meetings:**

|  |  |  |  |
| --- | --- | --- | --- |
| County Highway/ Transportation Departments | Statewide Agencies | Transit Operators | Municipalities |
| Cook 2-14-2013  DuPage 1-30-2013  Kane 1-30-2013  Lake 2-11-2013  Will 4-11-2013  McHenry– none | Illinois Tollway  1-28-2013  IDOT:  ITS Office 1-11-2014  CVO Staff 2-4-2013  District 1 1-16-2013 | CTA 2-13-2013  Pace 2-11-2013  Metra 2-19-2013, 3-5-2013  RTA 1-31-2013 | City of Chicago  1-17-2013  City of Naperville  1-30-2013 |

Once the initial interviews were completed, draft changes were added to the Architecture. This included changes indicated by the GO TO 2040 projects, action areas, and policies. In 2014, CMAP held a second round of meetings with transportation stakeholders. For this round, a draft web-based Architecture was generated using the Turbo Architecture © database, as well as the summary documents of inventory, projects and agreements. These included the draft changes collected from the information collected in 2013. Except for CTA, these meetings were held via conference calls instead of in person. CTA had a staff change since the previous meeting and it was felt appropriate to again meet in person with the new CTA Chief Information Officer at the CTA offices.

**Spring 2014 calls:**

|  |  |  |  |
| --- | --- | --- | --- |
| County Highway/ Transportation Departments | Statewide Agencies | Transit Operators | Municipalities |
| Cook 5-14-2014  DuPage 5-1-2014  Kane 4-24-2014  Lake 4-30-2014  Will 5-5-2014 | Illinois Tollway 5-2-2014  IDOT:  ITS Office 5-5-2014  CVO 4-24-2014  District 1 5-5-2014 | CTA 5-21-2014  Pace 5-6-2014  Metra 5-6-2014 | City of Chicago  4-30-2014  City of Naperville  5-23-2104 |

Meetings with police and emergency responders were not undertaken. Each of the ATTF agencies maintains a cooperative relationship with appropriate law enforcement and emergency response agencies. We relied on the ATTF members to comment on coordination activities underway with police and emergency response staff.

At the conclusion of the meetings and calls with the key stakeholders, all information was added to the revised Turbo Architecture© Database, exported to a revised web-based presentation, and the process documented in this Regional ITS Architecture v.3.

# Maintenance Plan Update

CMAP is responsible for maintaining the Northeastern Illinois Regional ITS Architecture. While CMAP assumes responsibility for maintenance, a group of core stakeholders act as an “institutional framework” to provide information and to review proposed changes to the Architecture. The Regional ITS Architecture is a consensus framework for integrating ITS systems in the region. The “institutional framework” is the Advanced Technology Task Force.

The maintenance plan adopted in 2008 made a number of recommended steps:

* Identify Change – focus on ITS projects; take advantage of the ATTF to facilitate the use and maintenance of the Regional Architecture; update the Change Request Form
* Evaluate/Approve Change – rekindle the ATTF Architecture subgroup to play a more active role in Architecture maintenance
* Update Baseline – training or outside support should be provided to facilitate Architecture maintenance
* Notify Stakeholders – approved Architecture changes should be distributed to regional ITS stakeholders to keep them updated and to encourage use of the Architecture

CMAP has included these recommended steps in the updated maintenance plan except for the identification of an ATTF ITS Architecture subgroup. There was little appetite for the development of an additional group, and so the revised plan reflects that ATTF as a whole serves that purpose.

The [Regional ITS Architecture V3 Maintenance Plan](http://www.cmap.illinois.gov/documents/10180/308490/Draft+Maintenance+Plan.docx/2b94131f-ffc0-41ce-8bcc-d014f3074cad) was recommended for approval by the Advanced Technology on xxx.

# Status Categories

Throughout the Regional 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 taken place 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 it in one way 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 we have not invested anything in creating it yet.

# Stakeholders Update

Stakeholder coordination and involvement are key elements for developing of 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 V3 were mainly based on agency name changes.

* Will County Highway Department became the Will County Division of Transportation.
* Cook County Highway Department became the Cook County Division of Transportation and Highways.
* The Illinois State Toll Highway Authority has not changed its official name, but is now referred to as the Illinois Tollway.
* A new PPP partner was added to represent a number of private partners associated with the region’s system operators through agreements.

[Web-Based Presentation Stakeholder List](http://data.cmap.illinois.gov/its-draft-v3/stakes.htm)

# Inventory

The inventory, viewable either by stakeholder or entity, 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 OEMC Field Equipment”. This element represents all of the traffic signals, traffic detectors, 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 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 over 100 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 also links to the applicable ITS standards.

Some highlights of changes to the inventory include:

* Addition of potential IDOT toll collection and management systems to support congestion pricing.
* Addition of potential CMAP regional parking management system to support parking supply managed using pricing. This is a recommendation of GO TO 2040. Ultimately, these elements will likely belong to another stakeholder but that stakeholder has not yet been identified.
* Addition of potential CMAP regional VMT monitoring equipment to support conversion to VMT pricing. This is a recommendation of GO TO 2040. Ultimately, these elements will likely belong to another stakeholder but that stakeholder has not yet been identified.
* Addition of planned Metra Positive Train Control System, which will be implemented as required .
* Addition of PPP contactless fare equipment, card vending machines and fare management systems to represent the Ventra system.

[Web-based Presentation Inventory by Stakeholder](http://data.cmap.illinois.gov/its-draft-v3/invstake.htm)

# Needs and Services

The transportation needs for the region are defined as part of the transportation planning process. [GO TO 2040](http://www.cmap.illinois.gov/about/2040), the region’s comprehensive plan, emphasized maintaining and modernizing the system, implementing projects with ITS based operations strategies, and monitoring performance. The goal is to maintain today’s levels of congestion even with significant regional economic and population growth and to increase the share of trips using public transportation. The Regional Mobility component of the plan includes recommendations for concrete activities which contribute to achieving this goal. They are presented within three categories: Invest Strategically in Transportation, Major Capital Projects, Increase Commitment to Public Transit, and Create a More Efficient Freight network.

Service packages in the Regional ITS Architecture provide the ability to implement systems to address the identified transportation needs. Each service package includes a definition of what service it provides and includes links to the inventory items which are associated with the service package.

**Invest Strategically in Transportation**

GO TO 2040 recommends modernizing the system through investments in ITS, replacing the motor fuel tax with something that could be VMT pricing, implementing congestion pricing, and implementing parking pricing.

Examples of service packages that support these goals are:

|  |  |
| --- | --- |
| [Network Surveillance](http://data.cmap.illinois.gov/its-draft-v3/html/mp/mp21.htm)  [Traffic Signal Control](http://data.cmap.illinois.gov/its-draft-v3/html/mp/mp23.htm)  [Regional Traffic Management](http://data.cmap.illinois.gov/its-draft-v3/html/mp/mp27.htm)  [Traffic Incident Management](http://data.cmap.illinois.gov/its-draft-v3/html/mp/mp28.htm) | [Electronic Toll Collection](http://data.cmap.illinois.gov/its-draft-v3/html/mp/mp30.htm)  [Regional Parking Management](http://data.cmap.illinois.gov/its-draft-v3/html/mp/mp39.htm)  [Traffic Metering](http://data.cmap.illinois.gov/its-draft-v3/html/mp/mp24.htm)  [Lane Management](http://data.cmap.illinois.gov/its-draft-v3/html/mp/mp25.htm) |

**Major Capital Projects**

GO TO 2040 recommends implementing a group of major capital projects. 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 the major capital projects are:

|  |  |
| --- | --- |
| [Electronic Toll Collection](http://data.cmap.illinois.gov/its-draft-v3/html/mp/mp30.htm)  [Variable Speed Limits](http://data.cmap.illinois.gov/its-draft-v3/html/mp/mp101.htm)  [Dynamic Lane Management and Shoulder Use](http://data.cmap.illinois.gov/its-draft-v3/html/mp/mp102.htm) | [Dynamic Roadway Warning](http://data.cmap.illinois.gov/its-draft-v3/html/mp/mp103.htm)  [VMT Road User Payment](http://data.cmap.illinois.gov/its-draft-v3/html/mp/mp104.htm)  [Transportation Decision Support](http://data.cmap.illinois.gov/its-draft-v3/html/mp/mp29.htm) |

**Increase Commitment to Public Transit**

GO TO 2040 recommends modernizing the system using technological improvements to improve passenger experience and information, and to make it operate more efficiently. This includes implementing transit signal priority, and bus rapid transit services.

Example service packages that support these goals are:

|  |  |
| --- | --- |
| [Transit Vehicle Tracking](http://data.cmap.illinois.gov/its-draft-v3/html/mp/mp4.htm)  [Transit Fixed Route Operations](http://data.cmap.illinois.gov/its-draft-v3/html/mp/mp5.htm)  [Demand Response Transit Operations](http://data.cmap.illinois.gov/its-draft-v3/html/mp/mp6.htm)  [Transit Fare Collection Management](http://data.cmap.illinois.gov/its-draft-v3/html/mp/mp7.htm) | [Transit Security](http://data.cmap.illinois.gov/its-draft-v3/html/mp/mp8.htm)  [Transit Fleet Management](http://data.cmap.illinois.gov/its-draft-v3/html/mp/mp9.htm)  [Transit Traveler Information](http://data.cmap.illinois.gov/its-draft-v3/html/mp/mp11.htm)  [Transit Signal Priority](http://data.cmap.illinois.gov/its-draft-v3/html/mp/mp96.htm) |

**Create a More Efficient Freight Network**

GO TO 2040 recommendeds supporting regional trucking improvements and reducing at-grade highway rail crossing delay.

Example service packages that support these goals are:

|  |  |
| --- | --- |
| [Advanced Railroad Grade Crossing](http://data.cmap.illinois.gov/its-draft-v3/html/mp/mp34.htm)  [Freight Electronic Clearance](http://data.cmap.illinois.gov/its-draft-v3/html/mp/mp53.htm)  [CV Administrative Processes](http://data.cmap.illinois.gov/its-draft-v3/html/mp/mp54.htm)  [On-Board CVO Safety](http://data.cmap.illinois.gov/its-draft-v3/html/mp/mp58.htm) | [Weigh in Motion](http://data.cmap.illinois.gov/its-draft-v3/html/mp/mp56.htm)  [Roadside CVO Safety](http://data.cmap.illinois.gov/its-draft-v3/html/mp/mp57.htm)  [Parking Facility Management](http://data.cmap.illinois.gov/its-draft-v3/html/mp/mp36.htm)  [Railroad Operations Coordination](http://data.cmap.illinois.gov/its-draft-v3/html/mp/mp35.htm) |

# 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 Operation
* Electronic Toll Collection
* Emergency Management
* Freeway Management
* Incident Management
* Maintenance and Construction
* Parking Management
* Road User Payment
* Surface Street Management
* Transit Services
* Traveler Information

[Web-based Presentation Concept of Operations](http://data.cmap.illinois.gov/its-draft-v3/opsconcept.htm)

# 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 312 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 the National ITS Architecture (the mapping of elements to National ITS Architecture 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 connectivities that are not expressed in the National ITS Architecture. These Architecture flows define the interface requirements between the various elements in the Regional Architecture.

[Web-based Presentation Interfaces and Information Exchange](http://data.cmap.illinois.gov/its-draft-v3/interfaces.htm)

# 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 the National ITS Architecture and the mapping from transportation services to elements. The functions are easily understood, and are presented as a list of “shall” statements.

[Web-based Presentation Functional Requirements](http://data.cmap.illinois.gov/its-draft-v3/requirements.htm)

# 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.

A number of projects have been added with CMAP as the primary stakeholder in response to GO TO 2040 implementation. These are: CMAP Congestion Pricing, CMAP Dedicated and Managed Truckways, CMAP Parking Management, CMAP Unified Oversize/Overweight Permit System and CMAP VMT Pricing. While it is unlikely that CMAP will ultimately be the primary stakeholder, the ITS projects to needed to support the region’s long range goals should be included in the ITS Architecture.

Two projects have also been added under the flag of the Regional Transportation Operations Coalition, an operations group sponsored by CMAP. These are the RTOC Integration of Centers and RTOC PSAP Integration projects. In this case, RTOC is not an individual agency but a cooperative group representing the region’s transportation system operators. These two activities have risen to the top of the list as this group’s regional priorities. A number of agencies are already working on this activity (Kane County, Lake County, Will County, IDOT, Illinois Tollway and CDOT), but as other unlisted agencies begins work on this activity, the Regional ITS Architecture acknowledges that it is a known priority.

Other projects have had minor changes to descriptions or names and are not included in the table of new projects. One notable project was eliminated, *Illinois Statewide 511 System,* because it was identified as no longer planned or even potential.

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

The following table of new projects highlights the additions to the Architecture.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Project Name | Description | | | Timeframe |
| CDOT Automated Speed Enforcement | This project includes the use of cameras and speed detection for automatic ticketing of speeding vehicles. The focus is on safety speed zones (schools and parks). | | | short |
| CDOT Bus Rapid Transit System | Implementation of bus rapid transit system. This project covers the road side of BRT development which includes changes in lane configurations, allowed turns, and transit signal priority, and other traffic signal changes. The transit side project elements, listed under the CTA BRT project include stations, station fare collection equipment, station passenger information, and unique BRT vehicles. Jeffrey Jump was the first BRT project. The Ashland Avenue BRT project is under development, as is an east-west Downtown BRT.     The Chicago DOT received UWP funding to develop a Chicago Bus Rapid Transit Master Plan is FY 13. | | | short |
| CDOT Camera Images for Traffic Surveillance | Project to expand use of automated enforcement camera images to use as traffic monitoring tools. Video images will be processed and used to count vehicles and pedestrians. | | | mid |
| CDOT Crash Data Integration | Implementation of electronic collection of crash reports on-site by Chicago Police Department using mobile data terminals. This is 75% complete and transmits xml formatted data to the Chicago Department of Transportation. | | | short |
| CDOT Critical Bridge Infrastructure Surveillance | This project involves installation of CCTV cameras and weather sensors on City of Chicago bridges. These devices ensure the safety and security of the bridges as well as the motorists. Video and sensor data will provide information to assist in pre-treatments with chemicals to prevent black ice buildup. | | | short |
| CDOT Data Pipeline - Communications Backbone | Provide connectivity from Daley Center to IDOT-CTIC and Gateway Servers at IDOT ITS Program Office. Will include fiber along CTA Blue Line and Tollway to IDOT District 1. | | | long |
| CDOT Interoperable Demonstration Milwaukee Avenue TSP | Demonstration of interoperable transit signal priority system on Milwaukee Avenue between Jefferson Park and Golf/Milwaukee. This segment incudes various traffic signals and serves both CTA and Pace buses. | | | short |
| CDOT Lake Shore Drive and 18th/31st Street Ramp Congestion Relief | This project implements coordination between Lake Shore Drive and the City of Chicago traffic signals on 18th St. and 31st St. exit ramps. The currently implemented system at the 18th street signal determines the level of congestion on the exit ramp using loop detectors. The signal timing would be modified to clear the off-ramp congestion on Lake Shore Drive. A similar system will be implemented for 31st Street. | | | short |
| CDOT Transportation Data Archive | This project creates a comprehensive archive of traffic related data. Data stored in the current archive includes average daily traffic, crash data, and a traffic signal inventory and operational information. Data can be combined and displayed on maps to get a comprehensive view. Currently data is accessible through an internal website with a map interface. In the future the interactive web-based map will be made available to the public. | | | short |
| CDOT TSP | Transit signal priority for buses. This project covers the the street side equipment including communications, signal upgrades, and agreements. CDOT is working cooperatively with RTA to identify priority TSP corridors in Chicago. Western Avenue is a priority corridor. | | | mid |
| CDOT US41 Lake Shore Drive Surveillance and Information System | Installation of traffic surveillance equipment to collect information and the addition of variable message signs providing traveler information regarding travel conditions on Lake Shore Drive | | | long |
| Chicago East-West BRT | An east west BRT corridor in downtown, which will be identified at the end of the current alternatives analysis. | | | short |
| Chicago Signal Controller Upgrade | This project upgrades signal controllers on the City of Chicago traffic signal network. About 300 older controllers will be replaced with advanced traffic controllers (ATC) with increased functionality and communications capabilities. In addition, about 600 signal heads will be fittted with LEDs. | | | short |
| Chicago Snow Command | This project installs in-ground sensors and other sensor technology to report road surface temperature, moisture levels, and traction level on over 300 miles of strategic arterial roadways in the City of Chicago. The data will be transmitted to both the Snow Command desk and the Chicago TMC. Data will be used to monitor and route city assets for roadway safety, including snow removal. | | | mid |
| Chicago Special Events Advisory System | System to provide event, shuttle and parking information to the public via the CDOT website and automatically provide event information to the Gateway Traveler Information System and the Truck Route Advisory System. | | | long |
| Chicago Wireless Traffic Signal Interconnects | This project will interconnect signals along 16 arterial corridors in the City of Chicago. The signals will be connected to each other and a central server over a hybrid wireless/fiber network. Where possible, signals will be operated under a centralized signal control. | | | mid |
| CMAP Congestion Pricing | GO TO 2040 recommends implementing congestion pricing. Any investment in ITS infrastructure which supports congestion pricing is consistent with the region's ITS Architecture. | | | mid |
| CMAP Dedicated and Managed Truckways | GO TO 2040 plan recommendation: Implement truckways or truck-only lanes, in order to improve safety and increase efficiencies through separating large trucks and passenger vehicles. Provide an alternative for freight to avoid certain corridors due to peak hour passenger vehicle congestion. Potential corridors: Illiana Expressway, I-55/Stevenson Expressway or connections between intermodal freight terminals. | | | long |
| CMAP Parking Management | GO TO 2040 plan recommendation. Local governments can utilize parking pricing along with other parking management strategies to promote efficient use of existing parking. Examples of parking management strategies include shared parking plans, improved information on availability of parking, and reforming city ordinances to reduce parking requirements for new developments, which are typically designed to accommodate rare peak demand. Revenues generated can assist local governments in the maintenance and management of their existing transportation infrastructure or help improve transit service.     Similar to congestion pricing, the mechanism of "variable pricing" for parking can be used as a demand management tool for congested road facilities, and also raise considerable revenues. Variable parking pricing seeks to apply a free market-inspired pricing system to more efficiently allocate parking supply, with higher prices charged at times and locations of peak demand. Variable pricing has the promise of both effective congestion mitigation and the ability to raise considerable sums for local government. | | | long |
| CMAP Unified Oversize/Overweight Permit System | GO TO 2040 recommends creating a more efficient freight system. Currently, multiple permit applications are required for oversize/overweight vehicles. System operators are working to improve each of their own permit processes. Ultimately, however, it is desirable for the state to have a unified web-based permitting system. | | | long |
| CMAP VMT Pricing | GO TO 2040 plan recommendation. As the fuel efficiency of automobiles increases along with the use of non-petroleum based fuels, there will be a long term need to replace the MFT. This could take the form of a VMT fee. Existing Global Positioning System (GPS) technology has the dynamic potential to charge fees based upon location/roadway and time of day. (GO TO 2040) | | | long |
| Cook County Central Signal Control | Cook County signal interconnects are currently closed loop systems but a few of them are linked together. Cook county also currently has 3 different types of signal systems. This project will implement a centralized control capability for the traffic signals. The system is intended to be compatible with other agency systems to facilitate communication. | | | mid |
| Cook County Department of Transportation and Highways Fleet AVL | Project to equip Cook County DOTH vehicles with automatic vehicle location technology for improved tracking and management of department operations. | | | short |
| Cook County Detection Type Conversion | Conversion of detection to video or radar at minor street intersections. This will allow municipalites to complete road work without permits and to do it without damaging detection equipment. | | | long |
| Cook County Field Device Expansion | Expansion of the Cook County field implementation including cameras, arterial dynamic message signs, arterial performance monitoring equipment, emergency vehicle pre-emption and road weather stations. | | | mid |
| Cook County Lake-Cook Traffic Management | Arterial travel management including advanced incident detection and response, traveler information, and performance monitoring. The first stage of this project, which is underway, is to establish communications between Lake-Cook Road field equipment and the Lake County TMC, starting with the segments 1) between Lexington Drive and Arlington Heights Road, and 2) between the Edens Expressway and Pinetree Rd/Carlisle Avenue. Communications has been established between the Lake County Passage TMC and the Cook County Department of Transportation and Highways to allow Cook County staff to manage traffic on Lake-Cook Road via Lake County Passage TMC. This includes 16.5 miles with 35 traffic signals as well as surveillance cameras. | | | long |
| Cook County Signal Interconnects | Expansion of Cook County signal interconnects. Currently >50% of signals are interconnected. This may include coordination of signal timing across municipal and county boundaries, and also expansion of the Cook County communication infrastructure. | | | mid |
| Cook DuPage Smart Corridors | Implementation of Smart Corridors identified in the Cook-DuPage Corridor Planning Study. Initial corridors have been identified. There are a broad range of potential Smart Corridors improvements, including signal interconnects, time-of-day parking restrictions and other right-of-way capacity improvements, real-time transit information, Transit Signal Priority (TSP), intersection improvements, information technology, Ethernet-based communication systems, crossover improvements, safety improvements, transit service and upgrades including route and stop locations, and policy issues to promote multijurisdictional coordination | | | mid |
| CTA Rail Station Audio Announcement Upgrade | Implement ambient noise monitoring at rail stations to adjust audio announcement volumes to appropriate levels. | | | mid |
| CTA 4G Communications Network | Establishment of a mobile 4G network that will work in the subway, allowing vehicle tracking by GPS and customers to use mobile devices. | | | mid |
| CTA Bus Fuel Management System | System associating a fuel pump, amount of fuel, and bus to track fuel use. | | | mid |
| CTA Bus Radio Communications Replacement and Upgrade | Project to replace current bus radio equipment with equipment that will integrate with the computer aided dispatch (CAD) system. It will replace much data transmitted over radio channels to the cell phone modem instead, freeing up radio channels for voice communication. The need for voice communication will be further reduced because the dispatchers will be able to send text messages to the new on-board MDT. The on-board MDT will be replaced with a different unit designed to give the operator locational information about preceeding buses and following buses allowing the operator to monitor and reduce bus bunching. This capability will also reduce the need for directions from supervisors bus bunching. | | | short |
| CTA Bus Rapid Transit | Implementation of a bus rapid transit system (BRT). There are three categories of BRT projects 1) existing (Jeffrey Jump) 2) in design (downtown east-west route) and 3) potential (Ashland and Western Avenues). This project includes the transit side elements needed to operate the service: agreements with CDOT for traffic signal operations, vehicles, on board technology, field equipment, and back office management systems. | | | short |
| CTA Facility Access Security System | Centralized system to provide secure access and tracking of entering personnel at field locations (garages, yards, terminals, etc.) | | | short |
| CTA Infrastructure Surveillance (Bus and Yard) | Installation of CCTV system at every bus garage and rail yard to protect infrastructure, with wireless access points to allow wireless communication of this information. This project is existing and under expansion. | | | short |
| CTA Infrastructure Surveillance (Subway Tunnels) | Installation of communication hubs and cameras to allow surveillance of subway tunnels. This project is existing and under expansion. | | | short |
| CTA Network Operations Center (NOC) | Center to monitor, report, diagnose and send repair crews to maintain field electronic, computer, and communication technologies. | | | mid |
| CTA Platform Personal Security | Help buttons installed on rail platforms that will activite a flashing blue strobe light. A camera will focus on the location and the image will be available at the control center. The control center will have a collocated Chicago Police Department station which can respond. | | | short |
| CTA Rail Line of Site Monitors | Installation of cameras that allow operators to view the entire train (especially on curved track locations) to ensure all passengers have cleared the doors. | | | mid |
| CTA Station Master Project | Upgrading and standardizing communications, hardware, software, and field equipment at CTA rail station systemwide. Communications hubs will be installed systemwide. This will improve maintenance efficiency and the improve the ability to monitor and manage station located technology remotely. | | | mid |
| CTA Subway CCTV Station Portal Security | Installation of a system of security cameras to monitor subway exit portals to supplement current alarm system. City of Chicago OEMC will have access to all camera images. | | | short |
| CTA Transit Signal Priority Corridors | Implementation of a system of TSP corridors in the CTA service area. This project will include vehicle equipment on the transit side, and roadside equipment. | | | short |
| CTA Video Retrieval , Archiving and Review System | Development of automated and/or request-based retrieval of video from bus vehicle cameras. Trains alredy offload all video images. Development of an archiving system with indexing of video by location and time which facilitates access and review of desired video images. | | | mid |
| DuPage County Centralized Traffic Signal Control | Hardware, software and communications infrastructure needed to centrally manage DuPage County signals. This will initially provide a centralized signal and CCTV management system for 100 intersections iin northern DuPage County. Full buildout will include 900 signals throughout the county with interfaces to incident, fleet, transit, law enforcement and to Aurora and Naperville TMCs. In the future, this could be monitored and managed at the planned DuPage County TMC. | | | short |
| DuPage County Dynamic Alternate Route System | This system will respond to real time planned or unplanned events, identifying alternate routes based on traffic conditions, provide input to traffic signal operations serving alternate routes if needed and include a GIS database to provide multiple agencies with access to alternate route information as well as incident and emergency management information through a secure Internet website. | | | long |
| DuPage County Field Device Expansion | This project will plan, implement, operate, maintain and monitor coordinated signal systems and upgrades, communications infrastructure, RWIS, CCTV, DMS, emergency pre-emption and transit signal priority, vehicle and pedestrian detection. | | | mid |
| DuPage County Gateway Integration | Communication, hardware and software needed to exchange travel information with the Gateway Traveler Information System, which provides real time traffic information on TravelMidwest.com | | | long |
| DuPage County Highway-Rail Information System | This project will consist of systems to monitor the status of highway-rail crossings and provide real-time highway-rail blockage updates to emergency responders, traffic managers, and the traveling public. | | | long |
| DuPage County ITS Hub | Development of a central computer system to receive, disseminate and archive transportation information. Building on Recommendations from the “Feasibility Study for Multi-Jurisdictional Signal Timing and Monitoring in DuPage County, Illinois,” this project would expand current DuPage County efforts to create a centralized data source that allows any participating agency to access traffic data across the county (e.g., tube counts, intersection turn movement counts, traffic signal timing plans, CCTV  video). | | | mid |
| DuPage County Multi-Jurisdictional Communications Channel Integration | Integration of communications channels to ensure interoperability and the ability to communicate efficiently, especially during emergency situations. This project builds on existing efforts to provide a common frequency for responders to communicate directly  with each other. | | | mid |
| DuPage County Signal Interconnects | Coordination of signals on county highways. May include signal timing across municipal and county boundaries. May require expanding county communication network. DuPage County currently has a number of multi-jurisdictional signal interconnects: on St. Charles Road in Elmhurst, Villa Park and Lombard; also on 75th street in Naperville, DuPage County, and IDOT. Responsibility is split between maintenance and timing, with the owner being responsible for maintenance and DuPage County being responsible for signal timing. | | | short |
| DuPage County TMC | This is a cooperative effort between DuPage County DOT, Naperville, and Aurora to develop traffic management center capabilities. This includes the hardware, software, and communications necessary to monitor traffic conditions, communicate with field devices, coordinate operations, and respond to incidents to reduce improve operations and reduce congestion.    DuPage County is currently drafting plans to upgrade the Traffic Management Center to provide Centralized Signal System software for the 100+ traffic signals in the north central area of the County and to expand the current CCTV system with enhanced video management software to reduce delays. The long range goal of the TMC is to connect the Central Signal System with the rest of the 800 signals in the County to provide the most efficient adaptive arterial traffic flow and to communicate with all enforcement and local agencies to provide motorists with real time incident notification and alternative route management. | | | mid |
| DuPage County Video Management System | System to collect, archive and retrieve video data. | | | long |
| IDOT Arterial Construction Closure Application Website | | This project will develop the software, communications, and processing needed to implement a web-based arterial lane closure request system for use by contractors. The information will be input online and processed. The contractor will receive the permit and the information about the lane closure will be automatically sent to appropriate IDOT staff and to real time traffic information providers. | | short |
| IDOT Expressway Construction Closure System | | This web-based system will receive contractor requests for lane closures in real time, process approvals and automatically forward appropriate information to Gateway Traveler Information System and other real time traffic information systems for distribution to the public. This currently operates only in District 1 but could be expanded statewide. | | short |
| IDOT Highway Advisory Radio System Coordination | | Coordinate HAR operations across agencies (IDOT and County systems, or IDOT and O'Hare/Midway Airports systems) This may include text to voice conversion, two-way communication with other agencies and automated sharing of event informationt. | | long |
| IDOT I-290 ITS Elements | | An EIS process studying adding additional roadway capacity to I-290 between Mannheim and Racine is underway. ITS elements will be include in the final design and will include traffic surveillance, traveler information, and may include a managed lane or congestion pricing on a managed lane. This project was recommended in the GO TO 2040 plan. | | mid |
| IDOT I-55 Managed Lane | | GO TO 2040 plan recommendation, I-55 between Weber Road and I-90/94. IDOT will implement one managed lane in each direction in the median of I-55. Management could include congestion pricing. | | mid |
| IDOT I-80 Traffic Data Collection | | Installation of power, sensors, and communications needed to support collection of traffic data on I-80 west of I-55. This is a coordinated effort between IDOT District 1 and IDOT District 3. | | short |
| IDOT Joliet Remote Bridge Operations System | | The project will include a command center, surveillance equipment, remote control systems and staff to control 6 moveable bridges in Joliet. | | mid |
| IDOT Predictive Travel Time Development | | This project would use archived data from the Gateway Traveler Information system to predict near-term highway performance and provide it to system operators and travelers. | | long |
| IDOT Regional Communications Backbone | | Installation of communications infrastructure regionwide, undertaken by the Illinois Department of Transportation and Illinois Central Management Services. This will connect major transportation, public safety and research entities in the region (e.g. Illinois Tollway, Chicago 911 center, county TMC's, University of Illinois in Chicago). Fiber installation is typically accomplished as a part of road construction or road reconstruction projects. Fiber capacity may also be provided through shared use agreements with public or private entities. Communciation services for transportation management and control functions may also be provided by wireless technology. | | mid |
| IDOT Signal Interconnects | | Coordination of signals on state highways. This project is ongoing | | long |
| IDOT Smart Highway I-94/US 41 | | Traffic surveillance, road weather surveillance, communications infrastructure, VMS, incident detection, dynamic lane management and incident management on I-94 and US 41, which are parallel facilities. I-94 is operated by the Illinois Tollway, wile US 41 is operated by the Illinois Department of Transportation, requiring high levels of cooperation and coordination to implement and operate the project. | | short |
| IDOT Suburban Chicago ATMS - Centralized Traffic Control | | Infrastructure, softrware/workstation licensing and intital set-up/monitoring of an ATMS in the Chicago Northwest Suburbs. Coordination of over 200 signals on IL 62, Arlington Heights Rd, US 20 and Barrington Road. Also video monitoring and detection on a fiber backbone with a central hub at IDOT District 1 Schaumburg. This involves IDOT Dsitrict 1, and Cook County Department of Transportation and Highways. | | long |
| Illinois Department of Transportation Truck Parking System | | Electronic truck parking information system to provide truck drivers with real time parking availability information. This will reduce the numbers of trucks parking in undesignated or unsafe locations and help drivers meet rest requirements to reduce the possibility of fatigued driving. | |  |
| Illinois Tollway DMS Expansion | | The Illinois Tollway uses a number of ways to provide information to drivers, including Dynamic Message Signs. This project will replace some DMS and expand the number of signed locations. | | short |
| Illinois Tollway Elgin OHare / Western Access ITS Infrastructure | | The Elgin O'Hare/Western access was recommended in GO TO 2040 as a new expressway with managed lanes. This project includes all communications, roadside equipment, hardware and software needed to support the roadway as a modern expressway. | | mid |
| Illinois Tollway Fleet Automatic Vehicle Location AVL | | GPS tracking of Illinois State Police District 15, maintenance, and HELP vehicles. The Illinois Tollway may track the location of vehicles to ascertain the progress of their activities. These activities can include ensuring the correct roads are being plowed and work activity is being performed at the correct locations. | | mid |
| Illinois Tollway Freight Efficiency Improvements | | This project consists of a number of freight related capabilities. Truck pre-clearance capabilities supported by Automated Vehicle Identification (AVI), weigh in motion sensors, transponders, back office databases and permanent truck scales at maintenance yards. Weigh in motion and preclearance is already used on a limited basis. A truck parking information system is also being considered. Outreach to the freight community ending in spring 2014 will help determine the types of improvements needed. | | mid |
| Illinois Tollway I-57/I-294 Interchange ITS Elements | | This new system interchange was recommended in GO TO 2040 and is an interchange between a tolled and free facility. This project supports all ITS investment associated with the project, including but not limited to communications infrastructure, VDS, electronic toll collection, and dynamic message signs. | | short |
| Illinois Tollway I-90 Smart Corridor | | The Illinois Tollway is rebuilding and widening the Jane Addams Memorial Tollway (I-90) as a 21st century, state-of-the-art corridor linking Rockford to O'Hare International Airport. The Jane Addams Memorial Tollway is part of Interstate 90 (I-90), the longest interstate in the United States, and covers 77 miles extending from near the Wisconsin border to the Kennedy Expressway. The I-90 corridor from Chicago to Rockford serves nearly one million travelers per day. This project was included in GO TO 2040, the regional comprehensive plan, as a managed lane.    The Tollway has entered into an agreement with FHWA to be a pilot Connected Vehicle Affiliated Testbed corridor agreement. The project includes all ITS equipment and systems that may support developing the corridor as a state-of-the-art expressway corridor. Improvements may include, but are not limited to, reliable power and communications, ATMS related equipment and systems to manage the lanes and those technologies supporting congestion pricing, V2I testbed status/and connected vehicle roadside integrations and system surveillance and operations. The project includes ramp queue detection which may be implemented in a way to also allow it to function as wrong way driving detection. The project is currently underway, but will take a number of years to complete.    This corridor is adjacent to the Kennedy Expressway, operated by the Illinois Department of Transportation, which may require some complementary treatment. | | mid |
| Illinois Tollway Ramp Queue Detection | | Traffic backing up on an off-ramp and onto the main line is dangerous and reduces capacity. Ramp queue detectors will monitor for traffic backups and allow the agency operating the arterial traffic light to clear the ramp. This is currently in operation on Army Trail Road at I-355. Tollway ramp devices initiate an alarm at the DuPage County Division of Transportation (DDOT) office and activate a pre-installed timing program in the Aries signal controller software, designed to clear ramps of queued traffic prior to having traffic back up onto the through lanes of the expressway. The goal is to implement this capability at all major interchanges. | | long |
| Illinois Tollway Real Time Performance Measurement | | All vehicle detection system (VDS) equipment is now the property of the Illinois Tollway. All monitors have been integrated into the TIMS. The tollway is investing in systems to perform real time performance measurement. This will be needed for managed lane activities, analyzing the results of operations changes, and reporting. | | short |
| Illinois Tollway Road Weather Information System Expansion | | Expand road weather monitoring by implementing environmental sensor stations ESS on 17 bridge decks that will measure a range of weather-related conditions, including pavement temperature and status (wet, dry, snow), subsurface pavement temperature, wind speed and direction, precipitation (amount, occurrence, type), water level conditions, humidity, and visibility. Weather data collected by agencies allows them to coordinate the pre-treating of roads via anti-icing practices; efficiently plan winter maintenance routes; reduce the amount of chemicals, sand, and salt used in roadway clearing operations; and reduce wear and tear on maintenance vehicles. This information can also be disseminated along with other incident data as real time transportation information. | | short |
| Illinois Tollway Systemwide Open Road Tolling Conversion to No Cash | | All toll collection locations on the Illinois Tollway system are equipped with electronic toll collecton equipment. Most are also equipped to accept cash tolls. The system will be gradually converted to all electronic collection. Tolls for vehicles unequipped with toll transponders will be collected via other methods, such as license plate recognition or in the long term with vehicle based RFID tags. All new interchanges or facilities will be constructed to be all electronic tolling, no cash accepted. | | long |
| Illinois Tollway Time of Day Shoulder Running Demo | | This project would manage tollway shoulders as additional capacity during certain times of the day. There are locations, such as at I-94 at IL 132 which accesses Great America, where traffic backs up dangerously and the shoulder could be used as storage capacity to keep autos out of traffic, or other locations which can use the shoulders at certain times of the day. This demo will help determine whether this is a useful strategy which should implemented more widely. | | short |
| Illinois Tollway Vehicle Detection System (VDS) Expansion | | Installation of VDS devices at system to system ramps and expansion of these devices on the mainline. | | short |
| Kane County Randall Road Adaptive Signal Control | | Installation of adaptive signal control at 12 locations on Randall Road. | |  |
| Kane County Randall Road Safety Improvements | | Randall Road is a high volume and higher speed arterial which also provides access to shopping and residential areas. This project includes ITS elements that are intended to improve safety along the roadway, including speed surveillance and driver alerts. | | mid |
| Kane County Signal Interconnects / ATMS Integration | | Integration of traffic signals into the Kane County TMC ATMS system. Upgrade of closed loop systems to ethernet where needed and integration of signals into ATMS network for improved signal management ability. | | short |
| Kane County Stearns Road ITS Corridor | | This project will equip Stearns Road between Randall and Dunham road with a number of ITS elements to improve congestion and safety, including road weather stations, CCTV, fiber integration with ATMS, traffic surveillance sensors, dynamic message signs, traffic signals, and speed surveillance with driver feedback signs.   Interconnection/integration of 6 existing traffic signals (including 2 existing traffic signalclosed loop systems) and various new ITS systems throughout the Stearns Road/IL 25 Bridge Corridor into theCounty’s Advanced Traffic Management System (ATMS) network.  Existing traffic signal locations include:  1. Randall Road & McDonald/Stearns Road 2. Stearns Road & McLean Road 3. McLean Boulevard & IL 31 4. Stearns Road & Stearns Road (IL 25) 5. Stearns Road (IL 25) & Gilbert Street 6. Stearns Road (IL 25)/Stearns Road & Dunham Road/IL 25  ITS systems include the following: 1. Adaptive Traffic Signal Control for all 6 signals locations. 2. Roadway Information Systems (RWIS) for identifying adverse pavement conditions and activate warning beacons on the Fox River bridge as well as identify local meteorlogic conditions.  3. Dynamic Message Signs (DMS) to provide roadway user information such as travel times and incident notification. 4. Remote CCTV Cameras at all signal locations and at the Fox River bridge to monitor traffic conditions and incidents.  5. Automated Traffic Data Collectors at various locations along the corridor to determine travel times,various traffic data and real time congestion levels. | | short |
| Lake County Adaptive Signal Control | | CMAQ funded implementation of new signal technology which uses real-time traffic congestion information to modify signal operation and reduce congestion. This is being installed at 7 signals on Aptikisic Road and 6 signals on Gilmer road. | | short |
| Lake County Asset Management System - Signs | | Data collection, communications and software to support managing location information, condition, and maintenance of Lake County's sign inventory. | | short |
| Lake County Countywide Bluetooth Traffic Monitoring | | Currently LCDOT is monitoring the Washington Street corridor travel time using Bluetooth Technology. The travel time information is being provided through the Lake County Passage website, on the radio and on message boards. This technology will be expanded on a corridor by corridor basis throughout the county. | | mid |
| Lake County Permanent Count Stations | | New permanent count station technologies are being tested. Ten permanent count stations will be added to the single location which currently existsl | | short |
| Lake County PSAP Coordination | | Expansion of the number of Public Safety Answering Points which share data with Lake County Passage TMC. The participants are ETSB agencies and various municipalities. This project includes the communications, hardware and software needed to share incident data and camera images between participants. | |  |
| Lake County Signal Interconnects | | Communications between traffic signals. Some are already interconnected, and the system is being expanded. As the system is developed, linked traffic signals also communicate with the Lake County Traffic Management Center central control. | | mid |
| Lake County Smart Street Lighting | | LED street lighting combined with sensors and communication infrastructure and management system. LED lights are long lasting and feature adjustable light levels, and can report health back to TMC. Sensors may detect whether traffic is present and lighting is needed, and adjust lighting based on ambient lighting. | | long |
| Metra Automatic Passenger Counts | | Installation of automatic passenger counting equipment | | long |
| Metra Contactless Electronic Fare Collection | | Implementation of touchless acceptance of credit cards for fare payment. This includes all hardware, software and communications infrastructure needed to implement the project. Metra plans to complete this project by 2015. | | short |
| Metra Downtown Station CCTV Expansion | | Installation of 800 cameras in and around downtown Metra stations. This is part of Operation Virtual Shied. | | short |
| Metra Electric CCTV Expansion | | Installation of 370 cameras on Metra Electric platforms and stations. | | short |
| Metra Fiber Communications Backbone | | Completion of fiber communication network along all Metra rail lines. This project will support communications with station based equipment, for passenger wi-fi use and electronic fare collection. | | mid |
| Metra Mobile Electronic Ticketing | | Mobil phone ticketing. Purchase tickets on an Android or IPhone. The ticket is also displayed on the smart phone to the conductor. Single ride or passes may be purchased and expire at the appropriate time after being activated. | | short |
| Metra Positive Train Control | | Positive train control (PTC) is advanced technology specifically designed to automatically stop or slow a train before certain accidents occur. In particular, PTC is designed to prevent train-to-train collisions, derailments caused by excessive speed, unauthorized incursions by trains onto sections of track where repairs are being made and movement of a train through a track switch left in the wrong position. Currently planned to be completed by the end of 2015. This project covers all hardware, software and communications needed to implement this service. | | short |
| Metra Ticket Vending Machine Expansion (TVM) | | Currently the Metra Electric District and downtown stations have electronic ticket vending machines. This project includes adding additional TVM locations. | | long |
| Metra Visual Information Display (VIDS) Expansion | | Expansion of the number of outlying stations with variable message signs. Currently 135 stations have VMS, there are 106 left to complete. | | mid |
| Metra Wi-Fi Service | | Provision of wi-fi service for passenger use and to potentially support on-board ticketing. | | long |
| Naperville Coordinated Traffic Signal Network | | Long term plan to integrate all of Naperville's closed loop systems into a coordinated traffic signal letwork. The initial phase consists of Washington Street signal system improvements, which will create a north/south spine by combining three existing interconnected signal systems that will communicate with centralized traffic management system software. Additional signal systems will be added to the network in future phases. | | short |
| Naperville Washington Street Adaptive Signal Control | | Installation of detection devices, hardware and softwware necessary at 31 signalized intersections on Washington Street in Naperville to operate adaptive signal control. | | short |
| Pace Bus on Shoulders | | Pace buses leaving travel lanes to operate on shoulders during parts of the day or under specific traffic conditions. This was successfully tested on I-55 and may be expanded to other parts of the systems. This lane is often used by emergency vehicles. Surveillance of traffic conditions is used.     This service will be implemented on I-90, where the Illinois Tollway is adding a lane. Pace will operate express buses from Randall Road to Rosemont Blue Line station operating on a managed shoulder and serving park and ride lots. The Illinois Tollway will manage the shoulder along with the other expressway lanes.    Design work for bus on shoulders on I-94/ Edens Expressway is also underway. | | short-mid |
| Pace Call and Ride | | Demand responsive service where traveler can use a cell phone to call for a ride in a designated area of about 9 square miles. This could also work by texting the request. Two-way commuication will confirm the ride, and the dispatch center can create a route in real time if there are multiple pickups and dispatch the vehicle to complete the request. This has been implemented in a number of locations and will be expanded. | | mid |
| Pace Paratransit Management System | | System to manage routing and scheduling to support regional ADA paratransit, dial a ride service and call and ride service. It requires software, mobile data terminals (MDTs) and vehicle AVL/GPS systems. | | short |
| Pace Queue Jump | | A system with bus-specific signal indications and signs will provide right of way early green to allow bus to move ahead of long traffic queues at signalized intersections. The study is completed. | | long |
| Pace Real Time Transit Information Expansion | | Expansion of variable message signs (BusInfo signs) providing real-time bus information information. | | mid |
| Pace Seat Broker Program | | This project would track the number of empty seats on vanpools in real time and use a web based system to match them with individual rider demand in real time. | | long |
| Pace TSP and ART Improvements | | This project includes roadside, vehicle, communications and back office investment needed to support development of the Pace Mobility Network. The mobility network includes implementation of transit signal priority and Arterial Rapid Transit. ART priority corridors, defined in a 2009 ART study are:   Milwaukee between Jefferson Park and Golf Mill Mall, extension: Golf Mill to Dundee Road  Dempster between Davis Street CTA and O'Hare Kiss and Fly  Oak Brook between CTA Blue Line/Pink Line and Yorktown Mall  Harlem between Milwaukee ART and 95th Street, extension: 95th to 159th Street  95th Street between 95th/Dan Ryan CTA and Harlem ART, extension Harlem ART to LaGrange Road  Halsted between 95th/Dan Ryan CTA and 159th Street, extension 159th to US 30  J-Line between Schaumburg/O'Hare and Oak Brook-Naperville | | mid |
| Rail Freight Positive Train Control | | Positive train control (PTC) is advanced technology specifically designed to automatically stop or slow a train before certain accidents occur. In particular, PTC is designed to prevent train-to-train collisions, derailments caused by excessive speed, unauthorized incursions by trains onto sections of track where repairs are being made and movement of a train through a track switch left in the wrong position. | | short |
| RTA Goroo Real Time/Predictive Trip Planner | | This project will incorporate real time and predictive information to the Goroo trip planner. | | long |
| RTOC Integration of Centers | | | This project will integrate local traffic management centers (IDOT, Illinois Tollway, Counties, Municipalities) to provide efficient flow of information between them, and also to the Gateway Traveler Information Center. This is especially important for PSAP coordination, which provides a secure connection for PSAP operators to send selected information and relevent information should be passed on to other centers and to the Gateway Traveler Information System. The project includes network connections and software, and will often use the regional communications backbone (Project 106). | mid |
| RTOC PSAP Integration | | | Highway operators benefit from knowledge about emergency situations occurring on their systems which impact operations. The counties, IDOT, city of Chicago, and the Illinois Tollway are pursuing (individually and as a group) information sharing with public safety answering points and emergency responders. Information sharing is desired to be automated, through established communications between PSAP, emergency responders, and transportation system operators. Highway operators are able to share camera images with emergency responders to evaluate emergency situations, while highway operators are able to respond to operational impacts. Lake County, Kane County, the Illinois Tollway, and IDOT have established some sharing. | mid |
| Will County Highway Department Vehicle Fleet Management | | | Continued development of fleet management procedures based on recently acquired GPS locational equipment installed on all highway department vehicles. | short |
| Will County Signal Interconnect | | | Coordination of signals on county highways. May include signal timing across municipal and county boundaries. May require expanding county communication network. Will County currently has a multi-jurisdictional signal interconnect an Weber Road in Crest Hill, Romeoville and Bolingbrook from Root Street to Lily Cache Lane. Responsibility is split between maintenance and timing, with the owner being responsible for maintenance and Will County being responsible for signal timing. |  |

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.

[Web-based Presentation Complete Projects Listing](http://data.cmap.illinois.gov/its-draft-v3/requirements.htm)

# 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 done either informal arrangements such as a Memorandum of Understanding (MOU) or with written agreements. 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.

[Web-based Presentation Agreements Listing](http://data.cmap.illinois.gov/its-draft-v3/agreements.htm)

# 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)

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](http://www.standards.its.dot.gov/) 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 is working to develop standards for an interoperable system which will included 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 identify standards that will be used in our region for any transit signal priority projects.

[Web-based Presentation Standards Listing](http://data.cmap.illinois.gov/its-draft-v3/standards.htm)

# 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 ensure that all proposed ITS projects are consistent with the Regional ITS Architecture and additional integration opportunities are considered, leading to more efficient implementations.

The Regional ITS Architecture should also be considered for support in 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 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 inter-agency cooperation) 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 system 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 the *National ITS Architectur*e);
* 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; and
* 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 the following table

|  |  |
| --- | --- |
| **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. |

In summary, 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.