

Cleveland Regional ITS Architecture and Deployment Plan

Executive Summary

April 2017

Introduction

The Cleveland Regional Intelligent Transportation System (ITS) Architecture provides a long-range plan for the deployment, integration, and operation of ITS in the Cleveland Region. The Regional ITS Architecture allows stakeholders to plan for what they want their system to look like in the long term and then break the system into smaller pieces that can be implemented over time as funding permits. Development of a Regional ITS Architecture encourages interoperability and resource sharing among agencies and allows for cohesive long-range planning among regional stakeholders. Completion and update of the plan is also required by the Federal Highway Administration (FHWA) and Federal Transit Administration (FTA) in order to use Highway Trust Fund money for ITS projects in the Region.

In the Cleveland Region, the first Regional ITS Architecture was developed in 2007. Since that time, several new ITS projects have been implemented and the National ITS Architecture, which serves as the basis for the Cleveland Regional ITS Architecture, has been updated. In order to reflect these changes, the Cleveland Urban Area Metropolitan Planning Organization (MPO), with assistance from the Tennessee Department of Transportation (TDOT), completed an update of the Regional ITS Architecture in 2017.

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What is ITS?

Intelligent Transportation Systems (ITS) are the application of electronic technologies and communications to improve the operation of the transportation system. Examples include traffic detectors, cameras, dynamic message signs, and real-time information on traffic conditions and bus locations.

Cleveland Regional Stakeholders

The update of the Cleveland Regional ITS Architecture was led by TDOT in coordination with the Cleveland MPO. The plan was driven by input from local, state, and federal stakeholders in the Cleveland Region. These stakeholders participated in workshops, interviews, and document reviews to update the Regional ITS Architecture. Stakeholder agencies included:

- Bradley County
- Chattanooga-Hamilton County/North Georgia Transportation Planning Organization (TPO)
- City of Cleveland
- Cleveland/Bradley County Chamber of Commerce
- Cleveland City Schools
- Cleveland Transit / Southeast Tennessee Human Resource Agency (SETHRA)
- Cleveland Urban Area Metropolitan Planning Organization (MPO)
- Cleveland Utilities
- Federal Highway Administration
- TDOT Long Range Planning Division
- TDOT Region 2
- TDOT Traffic Operations Division



ITS Architecture

Cleveland Regional ITS Architecture Project Approach

The Cleveland Regional ITS Architecture was developed using a consensus approach with input from stakeholder agencies throughout the Region. Three key steps were used to develop the plan.

Step 1 – Identify Needs and ITS Inventory

Stakeholder needs as well as existing and planned ITS elements in the Region were identified. Elements were categorized as centers, vehicles, travelers, or field devices when developing the Regional ITS Architecture.

Step 2 – Develop ITS Service Packages

ITS service packages represent the services that ITS can provide to address one or more needs in the Region. In the Cleveland Region, a total of 38 service packages were identified and prioritized as high, medium, or low. Service packages not only identify a service, but also show how that service will be operated and the information flows that will occur between agencies.

Step 3 – Identify Sequence of ITS Projects to Deploy in the Region

The ITS Deployment Plan section of the Regional ITS Architecture identifies the projects that stakeholders recommended for deployment in the Cleveland Region. These projects will assist the regional with implementing the ITS services identified in the ITS service packages.

What is an ITS Architecture?

An ITS architecture is a long-range plan for how to deploy, integrate, and operate ITS in a region.

Cleveland Region ITS Service Packages

ITS service packages outline the functions and services that stakeholders envision ITS will perform now and in the future. Stakeholders selected and prioritized ITS service packages into high, medium, and low priorities based on regional needs, feasibility, likelihood of deployment, and overall contribution of the ITS service package to meeting the goals and vision for ITS functionality in the Region. The high priority ITS service packages identified by stakeholders in the Cleveland Region are listed below.

Traffic Management

- Network Surveillance
- Traffic Signal Control
- Traffic Information Dissemination
- Traffic Incident Management System
- Mixed Use Warning Systems

Public Transportation Management

- Transit Vehicle Tracking
- Transit Fixed-Route Operations
- Demand Response Transit Operations
- Transit Fare Collection Management
- Transit Security
- Multimodal Coordination
- Transit Traveler Information
- Transit Signal Priority
- Transit Passenger Counting

Emergency Management

- Emergency Call-Taking and Dispatch
- Emergency Routing
- Roadway Service Patrols
- Wide-Area Alert

Maintenance and Construction Management

- Road Weather Data Collection
- Weather Information Processing and Distribution
- Work Zone Management
- Maintenance and Construction Activity Coordination

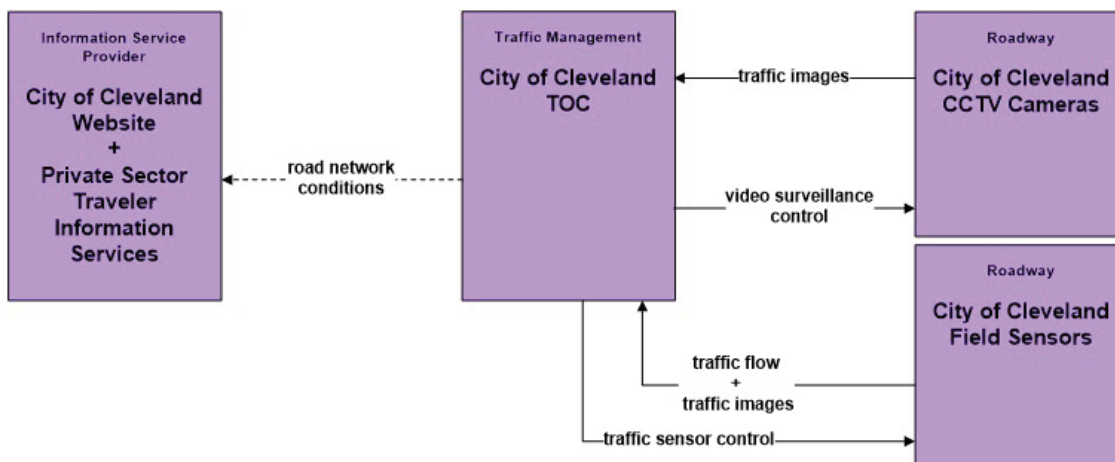
Traveler Information

- Broadcast Traveler Information
- Interactive Traveler Information

Archived Data Management

- ITS Data Mart

Example ITS Service Package ATMS01 – City of Cleveland Network Surveillance



Cleveland Region Recommended ITS Projects

A list of recommended ITS projects for the Cleveland Region was developed through input from stakeholders during the Regional ITS Architecture development process. Stakeholders grouped projects into timeframes for deployment based on priority, dependence on other projects, technology, and feasibility. Below is a summary of projects recommended for deployment in the short-term by stakeholder agencies in the Region. A complete listing of all the projects identified is found in the ITS Deployment Plan section of the Regional ITS Architecture.

TDOT Projects

- TDOT HELP Vehicle Service Area Expansion to Bradley and McMinn Counties
- TDOT Queue Detection at Freeway Off Ramps

SETHRA/Cleveland Transit Projects

- Cleveland Transit System Stop Annunciation
- Cleveland Transit Automatic Passenger Counting
- Cleveland Transit Dynamic Message Signs (DMS) for Bus Arrival Times
- Cleveland Transit Website and App Development
- Cleveland Transit Transfer Station CCTV Surveillance
- Cleveland Transit System Electronic Fare Collection
- SETHRA/Cleveland Transit Data Archive

Other Agency Projects

- Cleveland Urban Area MPO GreenTrips Program

What is an ITS Deployment Plan?

An ITS Deployment Plan identifies the projects that need to be implemented in order to meet ITS needs and deliver the ITS services identified in the Regional ITS Architecture

Municipal Projects

- Cleveland Signal System Upgrade and Traffic Management Enhancements
- Cleveland Closed Circuit Television (CCTV) Camera Implementation
- Cleveland Overheight Detection and Warning System on SR 40/US 64
- Cleveland HAWK Beacon Implementation
- Cleveland Emergency Vehicle Signal Preemption Expansion
- City of Cleveland Coordination with TDOT Region 2 Traffic Management Center (TMC) - Chattanooga



CCTV Cameras



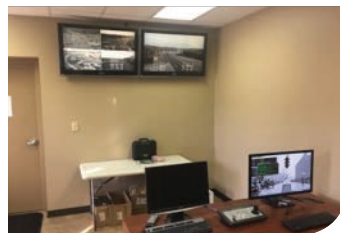
Freeway Service Patrol



Emergency Vehicle Traffic Signal Preemption



Improved Transit Operations



Traffic Operations Center



Traffic Signal Coordination

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Cleveland Use and Maintenance Plan

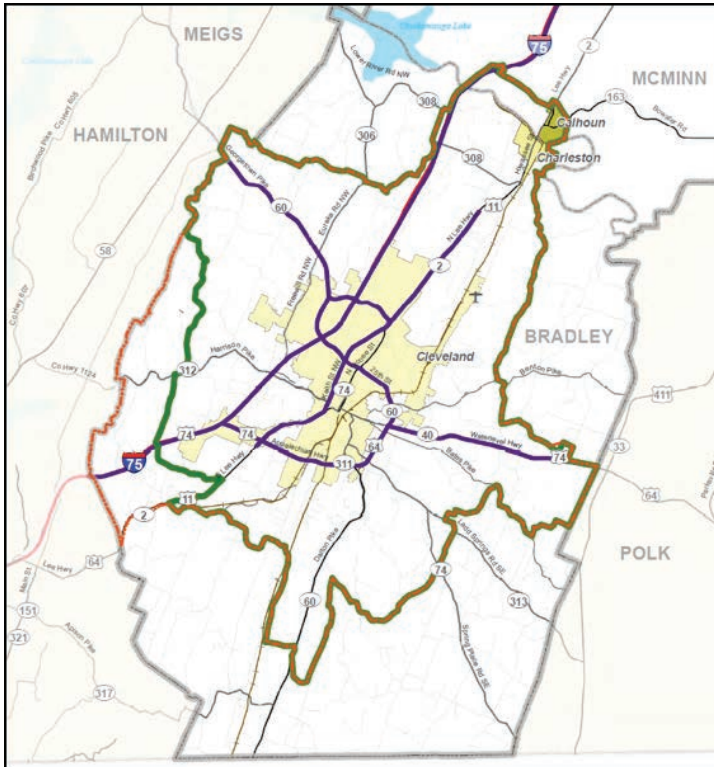
Use and maintenance of the Regional ITS Architecture and Deployment Plan will be important to ensure that requirements are met for the use of federal transportation funding of ITS in the Cleveland Region. Stakeholders in the Region developed the following guidelines to address use and maintenance of the plan.

ITS Architecture Use

As ITS projects are developed, they will be compared to the applicable ITS service packages in the Regional ITS Architecture to ensure those projects are eligible for federal transportation funding. Any discrepancies between the planned project and the Regional ITS Architecture will be resolved either by modifying the project or the ITS service packages. Changes to the ITS service packages will be documented on an Architecture Maintenance Documentation Form. All change forms will be retained by the Cleveland Urban Area MPO until the next plan update.

Cleveland Regional Boundaries

The Cleveland Region includes all of Bradley County and the southern portion of McMinn County as shown in the map below.



Cleveland Regional ITS Architecture Boundaries

ITS Architecture Maintenance

The stakeholder group agreed that the Regional ITS Architecture should be reviewed every five years, in the year preceding the Regional Transportation Plan (RTP) update, to determine if a full update is necessary. By completing a full update prior to the RTP update, stakeholders will be able to determine the ITS needs and projects that are most important to the Region and document those needs and projects for consideration when developing the RTP. An updated Regional ITS Architecture will also make it easier for the stakeholders to show conformance to the Regional ITS Architecture, which is required when deploying ITS projects using federal transportation funds.

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