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GEORGIA'S ITS STRATEGIC DEPLOYMENT PLAN
A NEW VISION FOR ITS

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ABSTRACT

The Georgia Intelligent Transportation Systems Strategic Deployment Plan (SDP) provides guidelines for the appropriate deployment of intelligent transportation systems (ITS) capabilities along all roadways (urban or rural, controlled access, or surface street) in Georgia. Unlike previous strategic plans, this SDP does not attempt to identify a comprehensive list of ITS projects to move forward; rather, it helps engineering professionals determine the correct types and density of coverage of ITS deployments along any roadway. The SDP was developed though a series of steering committee and stakeholder outreach meetings that defined the ITS capabilities appropriate for different types of roadways. It is envisioned that the SDP will be used by the Georgia Department of Transportation during project programming, concept development, and project design to guide these deployment decisions and ensure that ITS is deployed in a reasonable and appropriate manner.

INTRODUCTION

The Georgia Intelligent Transportation Systems Strategic Deployment Plan (SDP) was developed to provide specific guidance as to **where** and **when** intelligent transportation systems (ITS) should be deployed along roadways, freeways, surface streets, and as stand-alone deployments. The SDP defines **how** to achieve the ITS vision that is defined in the ITS Concept of Operations for Georgia.

In addition to providing guidance as to where and when to deploy ITS, the SDP provides guidance as to **how much** ITS to deploy in a project. This guidance is utilized during:

- Preliminary and long-range planning to develop cost estimates and project funding;
- Project concept development, following the Georgia Department of Transportation (GDOT) Plan Development Process (PDP); and
- Project design, following the GDOT PDP.

The role of the SDP is to provide support for ITS deployments that will help to achieve the vision of ITS in Georgia. By identifying ITS needs during the early stages of project planning, sufficient ITS budgets can be programmed for each project. Using the SDP during the project concept phase ensures that the project team has identified needs that can be addressed by the inclusion of ITS infrastructure. Finally, during the design phase, the SDP will support the adequate deployment of ITS capabilities to satisfy those needs identified in the project concept.

TECHNOLOGY NEUTRAL

The SDP was written to be technology neutral. The capabilities, and not the technology of ITS deployments, are the key issues considered. This allows the SDP to remain valid and adapt to changes in technology over time. For example, an ITS capability is the determination of vehicle speeds on a section of roadway. Several ITS technologies are currently capable of satisfying this need, including video and radar-based detection; however, new technologies and devices are likely to develop over time. Thus, the need for speed detection, and not the technology to be employed, should be considered when making ITS deployment plans.

The SDP is not intended to provide a single list of projects that should be deployed to achieve some future "ideal" state of ITS deployment in Georgia. Efforts to work through such a list would likely fail early in the process. The SDP provides the guidance that can be applied to all future projects; such guidance is less susceptible to major changes over time that would make it obsolete.

COLLABORATIVE EFFORT

The SDP was developed based on discussions with ITS experts and decision makers throughout Georgia. These included representatives from the GDOT, local (city and county) traffic engineering departments, State Road and Tollway Authority (SRTA), Georgia Regional

Transportation Authority (GRTA), Atlanta Regional Commission (ARC), the Federal Highway Administration (FHWA), and ITS experts in the consulting industry. Early in the SDP development process, a steering committee was formed to guide the plan's development. The steering committee was brought together at several key points in the plan development to provide input and guidance.

STRATEGIC DEPLOYMENT OF ITS ALONG ROADWAYS

ITS device deployments should be scheduled to occur when other, larger roadway projects are planned so that the public is not subjected to multiple construction projects that would adversely disrupt traffic in the area. The decision to deploy ITS devices in the field requires a few underlying conditions to be met before such a deployment can be considered as a cost-effective investment. These conditions include the following:

- The field devices can be connected to the central control facility of the agency that will maintain and operate the devices
- The local maintaining agency is prepared to operate, manage, and maintain the field devices
- The deployment of the field devices is consistent with the overall state or local ITS concept of operations

Many different ITS capabilities are appropriate for deployment during roadway projects. A brief explanation of each ITS capability is shown below:

- **Surveillance:** Surveillance refers to the ability of an operator to remotely view real-time images which are typically provided by closed-circuit television (CCTV) cameras.
- **Detection:** Detection refers to the collection of speed and occupancy data along a roadway. This service is normally provided by video detection devices, inductive loops, or even cell phone probes.
- **Control:** Control refers to the way in which traffic signals or ramp meters operate. Widely spaced signals may operate in isolation, while closely spaced signals may operate within a coordinated system.
- **Dissemination:** Dissemination refers to broadcasting information to the traveler. Local dissemination is typically provided by changeable message signs; local broadcast information is provided by highway advisory radio, 511, and the internet.
- **Communications:** Communications refers to the data link between field devices, and also between field devices and a central control facility, such as a traffic management center (TMC) or a traffic control center (TCC). Typical communications consist of fiber optic or wireless connections between field devices within a defined area and the group of devices communication to a TMC/TCC through an agency-owned fiber trunk line or a leased digital subscriber line (DSL).

STRATEGIC DEPLOYMENT OF ITS ALONG FREEWAYS

The primary reasons for deploying ITS devices along freeways are to provide incident management and to support information dissemination. In highly populated areas, ITS capabilities are focused on detecting, verifying, responding to, clearing, recovering from, and disseminating information about incidents. In these areas, access to power and communications is rarely an issue. In extremely rural areas, there is less need for closely spaced devices along the roadway. The cost of providing power and communications can be prohibitive. The SDP uses design year annual average daily traffic (AADT) to identify the appropriate levels of ITS deployments along freeways.

Capability	Purpose	Freeway - Level 1	Freeway - Level 2	
Surveillance	Incident Management	At all interchanges	At all interchanges where the cost of power and communication is not extreme.	At all
		Along mainline freeway to provide near-continuous coverage of the roadway	At midpoint between interchanges spaced more than 6 miles apart where power and communications costs are not extreme	At midpoi miles apa
		N/A	Provide surveillance to view roadway sections where local knowledge	
	Support Information Dissemination	At all CMS sites - Located to view CMS message		

Figure 1: Sample Freeway Deployment Levels

STRATEGIC DEPLOYMENT OF ITS FOR SURFACE STREETS

Much of the need for ITS deployments on surface streets is related to the need for traffic signals and the coordinated operation of those signals. The coupling index for groups of signals along the surface street is the primary factor to determine the appropriate level of ITS deployment on any surface street.

Capability	Purpose	Surface Street - Level 1	Surface Street - Level 2	Surface Street - Level 3
Surveillance	Observe traffic and signal operations	Provide surveillance to view traffic operations at all signalized intersections in coordinated		
		Provide surveillance of signalized intersections where v/c ratios exceed 0.85 during peak hours	Provide surveillance of signalized intersections where v/c ratios exceed 0.90 during peak hours	Provide surveillance of signalized int p
		Provide surveillance to view most of the roadway with a minimum of "blind" spots	Surveillance should cover major intersections and provide good overviews of the major roadway	Surveillance should cover major int knowledge or experience
	Support signal maintenance and trouble shooting	Provide surveillance at signalized intersections located more than 1 hour of travel from maintenance facility		Provide surveillance at signalized intersections located more than 2 hour travel from maintenance facility
	Support Information Dissemination	At all CMS sites - Located to view CMS message		

Figure 2: Sample Surface Street Deployment Levels

CONCLUSION

While the SDP does not provide a list of projects that must be completed, it does provide a methodology to assist engineers in developing the most appropriate ITS deployment for **any** section of roadway being considered. The SDP methodology provides a simple and useable set

of criteria for determining a starting point for an appropriate ITS deployment. From this starting point, the engineer can develop a customized ITS deployment that makes sense in terms of the necessary capabilities for the project and the overall needs of the region.

REFERENCE

(1) Georgia Department of Transportation, "ITS Strategic Deployment Plan (SDP)", NAV01-175, February 28, 2008