

LAWRENCE-DOUGLAS COUNTY INTELLIGENT JOURNEY

L-DC REGIONAL ITS ARCHITECTURE AND STRATEGIC DEPLOYMENT PLAN

EXECUTIVE SUMMARY

The Lawrence-Douglas County Metropolitan Planning Organization (L-DC MPO) has updated its 2008 Intelligent Transportation System (ITS) Strategic Deployment Plan (SDP) and Architecture. The goal of the update was *to develop a framework for the planning, design and deployment of ITS that improves the safety and efficiency of travel in the Lawrence-Douglas County Region.*

The **Strategic Deployment Plan** maps the Region's transportation needs to ITS Strategies and projects that use advanced technologies to provide cost-effective solutions.

The **Architecture** provides a framework for implementing advanced technologies in a way that maximizes information

sharing among agencies and the traveling public. It provides standards that allow multiple agencies to develop systems that can work together.

The Architecture also fulfills an FHWA/FTA requirement and allows the Region to use federal ITS funding.

ITS VISION:

The Region will use ITS to provide cost-effective and practical technologies that enhance the safety, capacity, operations and evaluation of the area's modes of transportation.



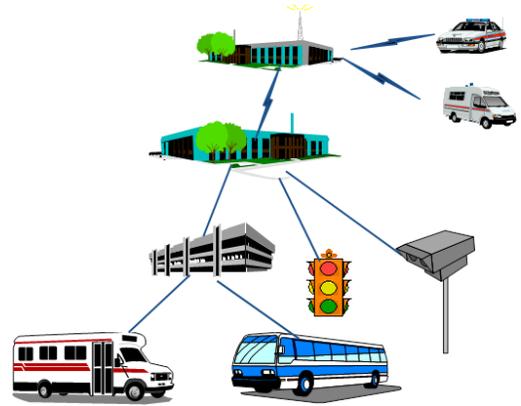
REGIONAL ITS GOALS

- 1. Integrate efficient and effective ITS** into Regional transportation planning and project development.
- 2. Improve information sharing** among the region's transportation agencies and with the public.
- 3. Increase the safety and security of all modes** of transportation through improved infrastructure monitoring and emergency management.
- 4. Improve the utilization** of existing facilities and infrastructure.
- 5. Improve the ability to evaluate and measure the performance** of the transportation network through the effective

WHAT IS ITS?

ITS is the use of information technologies to meet transportation needs. In other words, it is using technology to share information that can be used to improve transportation efficiency and safety. Some examples are:

- ❖ Providing incident and congestion information to a Traffic Operations Center so that the Center can modify traffic plans and dispatch resources.
- ❖ Sharing event and congestion information with travelers so that they can better plan the timing and routing of their trips.
- ❖ Collecting road and weather information so that maintenance crews can make better decisions about when and how to deploy equipment and materials.
- ❖ Letting bus riders know the actual time a bus will reach bus stops so that they can better plan transit trips.
- ❖ Detecting pedestrians and bicyclists on busy roadways and alerting traffic of their presence.



PROJECT PROCESS

The L-DC Regional ITS Architecture and SDP were developed through the following efforts of the Consultant Team and L-DC Region Stakeholders, under the direction of the Lawrence-Douglas County Metropolitan Planning Organization:

1. **Review of Existing ITS and Transportation Plans** – Established a baseline understanding of the Region’s existing plans and capabilities.
2. **Define the ITS Vision and Goals** – Created with local Stakeholders and mapped to the Region’s existing transportation goals to ensure that new ITS will complement the Region’s ongoing activities.
3. **Prioritize the Region’s Transportation Needs** – Worked with local Stakeholders to identify the most pressing issues that may be addressed using advanced technologies.
4. **Define Key ITS Strategies and Projects** – Mapped the needs to established ITS Strategies and defined Candidate Projects that will implement the ITS Strategies.
5. **Develop a Strategic Deployment Plan** – Stakeholders reviewed and sequenced Candidate ITS Projects over a ten-year timeframe. Projects were detailed, with funding possibilities and required interagency agreements, in the SDP.
6. **Create a Regional ITS Architecture** – Created a physical representation of the systems, information flows, functions national standards and Stakeholder responsibilities necessary for the Candidate ITS Projects.
7. **Develop an Architecture Use and Maintenance Plan** – Defined how the Region will maintain and use the Architecture to ensure cost-effective, interoperable technologies.



STAKEHOLDER INVOLVEMENT

Stakeholders representing the Region’s transportation agencies and the community were invited to participate in the Project. In total, 188 Stakeholders were identified and invited to participate. More than 80 provided feedback through the following means:



- ❖ **A Project Web Site** that contains Project information, deliverables and announcements. The site is located at <https://secure.iteris.com/share/LDC>.
- ❖ **An Online Survey** that allowed stakeholders to identify their travel behavior and their perceived needs.
- ❖ **Two Stakeholder Workshops** where stakeholders interacted and defined Regional needs and potential project ideas. The first workshop was in December 2014 and the second in April 2015.
- ❖ **Stakeholder Interviews** conducted in-person and by telephone. The interviews were designed to gain a better understanding of the plans, operations and needs of key stakeholders.

CANDIDATE ITS PROJECTS

The following table summarizes the ITS Projects that were identified as candidates solutions to address the L-DC Region’s transportation needs. **Note that inclusion on this list does not mean a project has been programmed or has committed funding.** The Plan is a means for identifying Candidate ITS Projects that should be considered for programming into the Region’s transportation funding processes.

Near-Term Projects (In the next zero to three years)	Needs Addressed	Estimated Cost
<p><u>Signal Coordination and Control Expansion</u> Connect 12 more signals and additional traffic cameras to the City of Lawrence Traffic Operations Center. This project is already funded and underway.</p>	<ul style="list-style-type: none"> • Improve traffic flow at intersections through improved signal timing and control. • Implement or improve signal coordination 	\$ 740,000
<p><u>Camera Sharing</u> Enable sharing traffic camera images to and from other Regional agencies, including KDOT, KC Scout and KTA to provide the region’s traffic management agencies to see what is happening outside their own networks.</p>	<ul style="list-style-type: none"> • Improve access to regional cameras. • Improve incident detection. • Improve freeway traffic surveillance. • Improve information sharing among agencies. 	\$60,000

Near-Term Projects (In the next zero to three years)	Needs Addressed	Estimated Cost
<p><u>Transit Traveler Information Improvements</u> Provide digital signs at key stops that display bus arrival times that are based on actual bus location.</p>	<ul style="list-style-type: none"> • Improve transit traveler information. • Expand traveler information delivery methods. • Enable dissemination/ display of real-time bus arrival times. 	<p>\$96,000 to \$144,000</p>
<p><u>Interagency Information Sharing</u> Develop strategies, protocols for sharing information and coordinating response to incidents and events. Establish a plan and agreements about the types of information to be shared and when. The Project may also identify and deploy a simple online platform for information sharing.</p>	<ul style="list-style-type: none"> • Improve information sharing among agencies. • Improve event management. • Improve inter-agency coordination. • Improve coordination on construction notification and information distribution. 	<p>\$100,000</p>
<p><u>Work Zone Management</u> Deploy advanced technologies to better share work zone information with travelers, and better monitor work zone traffic and safety conditions.</p>	<ul style="list-style-type: none"> • Improve/enhance work zone traffic handling plans. • Increase use of portable traffic control equipment. 	<p>\$120,000 to \$174,000</p>
<p><u>Dynamic Message Signs</u> Deploy four dynamic message signs to inform traffic entering the Region of events and traffic conditions.</p>	<ul style="list-style-type: none"> • Provide quality real time congestion related information. • Improve traffic information dissemination. • Provide better road construction information and notification. • Improve congestion management during seasonal/local events. 	<p>\$900,000 to \$1,200,000</p>
Total Estimated Near-Term Cost		<p>\$2,016,000 to \$2,418,000</p>

Medium-Term Projects (In the next three to six years)	Needs Addressed	Estimated Cost
<p><u>Communications Expansion</u> Continue to expand the Region’s fiber-optic network for connecting transportation systems. This project builds out the existing fiber optic network to intersections that are not connected and can potentially share fiber optic cable with other agencies.</p>	<ul style="list-style-type: none"> • Improve traffic information dissemination. • Improve information sharing among agencies. • Improve event management. • Improve inter-agency coordination. 	<p>\$839,400</p>
<p><u>Event and Incident Management Improvements</u> Deploy digital systems for sharing data about multiple agencies’ incident detection, response and coordination. A common information sharing platform can be used for all agencies to share incident and event information.</p>	<ul style="list-style-type: none"> • Improve event management. • Improve incidence response coordination between agencies. • Improve coordination on construction notification and information distribution. • Improve maintenance response to incidents and requests. 	<p>\$800,000 to \$2,000,000</p>

Medium-Term Projects (In the next three to six years)	Needs Addressed	Estimated Cost
<p><u>Transit Management Improvements</u> Provide electronic fareboxes that handle cashless transactions and track passenger boardings by location and time, and improve software for managing fixed-route service.</p>	<ul style="list-style-type: none"> Automate passenger counting. Improve service planning (scheduling and run-cutting). Improve fare payment systems. 	\$300,000 to \$392,000
<p><u>Lawrence Transit Signal Priority</u> Provide Lawrence Transit buses with extended or early green lights at intersections near the planned Transit Center.</p>	<ul style="list-style-type: none"> Reduce transit vehicle delay at key intersections. 	\$46,000 to \$98,000
<p><u>Signal Beacon Deployment</u> Provide advanced-warning beacon lights to warn of upcoming hazards such as flooded roads or red lights that with poor sight distances.</p>	<ul style="list-style-type: none"> Improve incident detection. Improve road/weather condition information. Improve ability to monitor and provide information about flooding. 	\$84,000 to \$120,000
<p><u>Parking Management System</u> Provide travelers with advance information about parking availability, and better coordinate parking availability among multiple facilities.</p>	<ul style="list-style-type: none"> Improve parking management and parking information. 	\$250,000 to \$1,000,000
Total Estimated Medium-Term Cost		\$2,319,400 to \$4,449,400

Long-Term Projects (In the next six to ten years)	Needs Addressed	Estimated Cost
<p><u>Emergency Signal Preemption Improvements</u> Deploy wireless signal preemption to give emergency vehicles more control over signals and to use more secure and reliable technology.</p>	<ul style="list-style-type: none"> Reduce emergency vehicle delays at signals. Enable remote emergency control of signals. 	\$166,000 to \$360,000
<p><u>Bicycle/Pedestrian Warning Systems</u> Install systems to detect bicyclists and pedestrians and alert traffic of their presence. This may include lit crosswalks and systems that grant walk signals when pedestrians are present.</p>	<ul style="list-style-type: none"> Improve bicycle/pedestrian warning systems. 	\$108,000 to \$152,000
<p><u>Weather Monitoring</u> Deploy additional weather sensing equipment in the Region and improve the sharing of weather information among Stakeholders, including camera images of roadways.</p>	<ul style="list-style-type: none"> Improve weather and road condition information. Improve maintenance response to incidents and requests. Improve ability to monitor and provide information about flooding. 	\$207,000 to \$309,000
<p><u>Regional Virtual Data Warehouse</u> Deploy technologies that improve the Region’s agencies’ ability to share traffic and incident information for planning, response and evaluation purposes. The solution would connect data systems and not develop a physical warehouse.</p>	<ul style="list-style-type: none"> Improve information sharing among agencies. Improve system operation monitoring. Improve coordination on construction notification and information distribution. Provide central information clearinghouse. 	\$15,000 to \$300,000

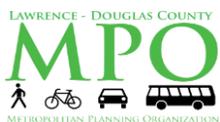
Long-Term Projects (In the next six to ten years)	Needs Addressed	Estimated Cost
Journey Trip Planner Deploy a multi-modal trip planner that allows the Region’s travelers to consider all travel options to reach their destinations. The Trip Planner would provide traffic, transit, parking, pedestrian and bicycle information in a single user interface.	<ul style="list-style-type: none"> • Improve multi-modal traveler information. • Provide interstate/inter-region traveler information covering a wide area. • Improve transit traveler information. • Expand traveler information delivery methods. 	\$300,000 to \$570,000
Traffic Detection Improvements Install improved traffic detection equipment that can accurately identify and classify vehicles, bicycles and pedestrians. Information can be used to make signal controllers more responsive and for analysis purposes.	<ul style="list-style-type: none"> • Improve traffic flow at intersections through improved signal timing and control. • Improve bicycle/pedestrian warning systems. 	\$774,000 to \$1,444,000
Total Estimated Long-Term Cost		\$1,570,000 to \$3,135,000
Total Cost of All Projects is \$5,905,400 to \$10,002,400		

USING THE PLAN AND ARCHITECTURE

The Lawrence-Douglas County (L-DC) Regional Intelligent Transportation System (ITS) Architecture is a tool for Stakeholders to use in developing consistent, interoperable and effective ITS. A Use and Maintenance Plan has been developed to provide the Region’s Stakeholders guidance. The Plan and Architecture should be used in:

- ❖ **Planning** so that new systems are interoperable and can exchange information with existing and other planned systems.
- ❖ **Development** to ensure systems are designed and built to provide the required functionality.
- ❖ **Implementation** to verify vendors use ITS standards and use open, non-proprietary data exchanged.

Additional Project information, including the ITS Strategic Deployment Plan and Architecture, are available at: <https://secure.iteris.com/share/LDC>



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