



Tuesday, April 13, 2021
10:30 - Noon
Virtual meeting hosted in
Parks and Recreation Administration Building
1141 Massachusetts St

To participate or provide public comment register via zoom: [Virtual Meeting Registration](#)

Written public comment must be received by the MPO by 5:00 p.m. on the day before the meeting. Send correspondence electronically to mpo@lawrenceks.org. Comments received after the deadline will not be posted and there is no guarantee that such comments will be considered. The MPO is sensitive to members of the public who may not have access to technology. For those persons, written comments may be dropped in the Utility Billing Drop Box, located at the cut-out at 6th Street and New Hampshire Street. Comments should be marked for the **MPO ITS Plan**.

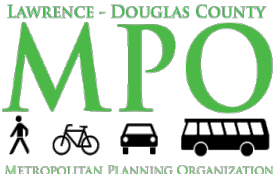
**The MPO will provide a method at the Parks and Recreation Administration Building for individuals without access to the internet or a telephone - and only such persons - to observe or participate in the meeting.*

Intelligent Transportation Systems (ITS) Steering Committee Agenda

- 1. Zoom Meeting Preamble**
- 2. Introductions**
- 3. Public Comment**
- 4. Meeting 2 Notes - Attached**
- 5. Plan Update Process - Attached**
- 6. Prioritizing Projects (Discussion) - Attached**
- 7. Necessary Agreements for ITS Projects (Discussion) - Attached**
- 8. Next Meeting**
 - Meeting 4 - April 26 @ 1:30

Special Accommodations: Please notify the Lawrence-Douglas County Metropolitan Planning Organization (L-DC MPO) at (785) 832-7700 at least 72 hours in advance if you require special accommodations to attend this meeting (i.e., qualified interpreter, large print, reader, hearing assistance). We will make every effort to meet reasonable requests.

The L-DC MPO programs do not discriminate against anyone on the basis of race, color, or national origin, according to Title VI of the Civil Rights Act of 1964. For more information or to obtain a Title VI Complaint Form, see www.lawrenceks.org/mpo/title6 or call (785) 832-7700.



MEETING 2 NOTES
 Intelligent Transportation Systems (ITS) Steering Committee
 Monday, March 29, 2021
 1:30-3:00 PM
 Virtual meeting hosted in
 Parks and Recreation Administration Building
 1141 Massachusetts St

	Agency	Stakeholder		Agency	Stakeholder
	FTA	Eva Steinman	X	Lawrence	Nick Hoyt
X	FHWA	David LaRoche	X		Dustin Smith
X	KDOT	Michael Flory, Taylor McHenry, Garry Olson, Mike Floberg	X		Caleb Pettengill
	KTA	David Jacobsen	X		Micah Seybold
X	KC Scout	Randy Johnson + Guest	X		Rob Neff
	Baldwin City	Ed Courton			Kevin Fussell
	Eudora	Branden Boyd	X	Douglas County	Chad Voigt
			X	Lawrence Transit	Adam Weigel
			X	KU On Wheels	Aaron Quisenberry
				Public	
X	L-DC MPO	Jessica Mortinger	X	Heather Thies	Cottonwood Inc.
X	L-DC MPO	Ashley Bryers			
X	L-DC MPO	Sarah Buford			
	L-DC MPO	Ari Leyva			

- 1. Zoom Meeting Preamble (1:30 pm)**
- 2. Introductions** – Introductions were made.
- 3. Public Comment** – No public comments were given.
- 4. Kickoff Meeting Notes (Discussion)** – Meeting notes were found satisfactory.
- 5. Plan Update Process (Discussion)** – Staff agreed on the Intelligent Transportation System (ITS) Plan Update timeline.

Intelligent Transportation System (ITS) Plan Update

Task	March 4 @ 1:30 - 3:00	March 29 @ 1:30 - 3:00	April 13 @ 10:30 - Noon	April 26 @ 1:30 - 3:00	May	June
Development						
Steering Committee	Kickoff	Meeting 2	Meeting 3	Meeting 4		
Meeting Topic	Overview, Discuss ITS needs, & Verify goals (T2040 & ITS)	Discuss projects (new & old)	Discuss timeline, priorities & necessary agreements	Review draft plan		
Homework	Review & comment on ITS needs & Review existing projects for Meeting 2	Provide any further comments on projects	Review & comment on necessary agreements	Review & comment on draft plan		
Review						
15-day public comment period					Anticipated - May 6 - May 21*	
Document public comments & make necessary edits					X	
TAC/MPO Policy Board consideration of ITS Plan						Anticipated - June 1 & June 17*
Pending Policy Board approval post online and send to KDOT, FHWA, and FTA						X

* Anticipated dates. The final dates depend on how the planning process advances.

2.25.21

** Public participation process includes: Newspaper advertisement, email to subscription list, place document online and at public locations - Baldwin City Public Library, Eudora City Hall, Lawrence Public Library, Lecompton City Hall, and MPO Office, send to TAC and Policy Board for review

6. Existing and new ITS Projects (Discussion) - Staff used Mural during the meeting to add changes and updates to current projects. Staff designated stakeholders responsible for finishing updates on each project before the next meeting.

A. Existing Projects, Signal Coordination and Control Expansion, and Camera Deployment and Image Sharing Project

Existing Projects

Projects	Estimated Cost
1. Signal Coordination and Control Expansion	\$ 740,000
2. Camera Sharing	\$60,000
3. Transit Traveler Information Improvements	\$94,000 to \$141,000
4. Interagency Information Sharing	\$100,000
5. Work Zone Management	\$120,000 to \$150,000
6. Dynamic Message Signs	\$900,000 to \$1,000,000
Total Estimated Near-Term Cost	\$2,074,000 to \$2,618,000
7. Communications Expansion (Fiber)	\$839,400
8. Event and Incident Management Improvements	\$800,000 to \$2,000,000
9. Transit Management Improvements	\$300,000 to \$393,000
10. Lawrence Transit Signal Priority	\$40,000 to \$80,000
11. Signal Beacon Deployment	\$84,000 to \$120,000
12. Parking Management System	\$250,000 to \$1,000,000
Total Estimated Medium-Term Cost	\$2,319,400 to \$4,489,400
13. Emergency Signal Preemption Improvements	\$146,000 to \$340,000
14. Bicycle/Delivery Warning Systems	\$108,000 to \$112,000
15. Weather Monitoring	\$207,000 to \$300,000
16. Regional Virtual Data Warehouse	\$15,000 to \$300,000
17. Journey Trip Planner	\$300,000 to \$370,000
18. Traffic Detection Improvements	\$774,000 to \$1,444,000
Total Estimated Long-Term Cost	\$1,376,000 to \$3,136,000
Total Cost of All Projects	\$5,969,400 to \$10,263,400

1. Signal Coordination and Control Expansion

1.1.1 Signal Coordination and Control Expansion Proj

2.0 - need to list locations in near term time frame

program with projects

maybe work with transit

Nick update

2. Camera Deployment and Image Sharing Project

1.1.2 Camera Deployment and Image Sharing Project

program with projects and long term

PTZ camera with 360

Caleb

B. Transit Traveler Information Improvements Project, Interagency Information Sharing Project, and Work Zone Management Project

3. Transit Traveler Information Improvements Project

1.1.3 Transit Traveler Information Improvements Project

Description: This project will provide real-time transit vehicle arrival times to transit passengers at bus stops and through the internet, Lawrence Transit and KU can then use this information to provide this information on an app to commuters' phones, and this project will increase information distribution through the use of electronic signs and the electronic signs will be installed at key stops and are being used as a Transit Traveler Information System location in the downtown transit center. The signs display 'Next bus arrival times. The work zone signs allow passengers to track the actual location of buses.



Timeline: Near term (next three years)

Project Area:

- Use to bus stop stops, locations to be determined
- For project locations
- Transit travel information

Lead/Contributor:

- City of Lawrence
- Lawrence Transit

Needs/Addressed:

- Improve multi-modal traveler information.
- Improve transit traveler information.
- Improve transit information delivery methods.
- Improve transit efficiency and information sharing.
- Monitor transit vehicle locations.
- Enable dissemination of real-time bus arrival times.

Other Stakeholders:

- ATADOC: [Transit Information Dissemination to Traffic](#) - Transit Traveler Information

Estimated Cost: The estimated cost for this project is approximately \$1000 per vehicle for a fleet of 10 vehicles, and up to ten bus stop signs, \$500 and \$1000 per sign. **Total estimated cost is \$20K to \$14,000.** This cost includes the existing vehicle location hardware on the buses to be used.

Performance Measures: The effectiveness of this project can be measured through the following measures:

- Transit reliability.
- Transit passenger satisfaction.

KU on Wheels & Lawrence Transit Person to Update: Adam

4. Interagency Information Sharing Project

1.1.4 Interagency Information Sharing Project

Description: This project will provide a platform for the Region's agencies to improve inter-agency information sharing about incidents and events occurring in the region and planned in the Region and other agencies. The Region's agencies will work together to develop a program for communicating incident and event information. It is envisioned that the program may be simple, but used by all key stakeholders to share information. Note that the City of Topeka is currently addressing a similar solution with a DOT funding. The IIS Region was formed from combining with and getting input from Topeka and Shawnee County.



Timeline: Near term (next three years)

Project Area: Lawrence-Douglas County Region

Lead/Contributor:

- City of Lawrence Municipal Services and Operations

Other Stakeholders:

- City of Lawrence Police
- Douglas County Emergency Communications
- Douglas County Public Works
- Douglas County Sheriff's Office
- KDOT
- KTA
- KU on Wheels
- University of Kansas
- Lawrence Transit
- Local Cities
- Local Cities Emergency Services
- KC Scout

Needs/Addressed:

- Improve information sharing among agencies.
- Improve incident management.
- Improve inter-agency coordination.
- Improve incident response coordination among agencies.
- Improve incident response times and routing.
- Improve coordination of construction notification and information distribution.
- Improve coordination on road maintenance and construction activities.
- Improve coordination of maintenance activities prior to anticipated needs.

Other Stakeholders:

- ATADOC: [Transportation Operations Data Sharing](#) - This service package doesn't exist in IIS-DT. The service package uses the transportation operations data available in transportation system locations. The information from these systems, processes, and other information on traffic and road conditions and other information directly used in the transportation system and other systems. This information is used to improve incident response times and routing. The information is used to improve coordination of construction notification and information distribution. The information is used to improve coordination on road maintenance and construction activities. The information is used to improve coordination of maintenance activities prior to anticipated needs.
- ATADOC: [Traffic Information Dissemination to Traffic](#) - This service package doesn't exist in IIS-DT. The service package uses the transportation operations data available in transportation system locations. The information from these systems, processes, and other information on traffic and road conditions and other information directly used in the transportation system and other systems. This information is used to improve incident response times and routing. The information is used to improve coordination of construction notification and information distribution. The information is used to improve coordination on road maintenance and construction activities. The information is used to improve coordination of maintenance activities prior to anticipated needs.
- MCD: [Maintenance and Construction Activity Coordination](#)

Estimated Cost: The estimated cost of interagency information sharing is \$100,000. This estimate is based on the amount the City of Topeka and KDOT agreed to for the Topeka Shawnee County solution and it is assumed that a similar cost will apply to the IIS Region.

Performance Measures: The effectiveness of this project can be measured through the following measures:


- Incidence response times.
- Incident response times.
- Incident response times.
- Satisfaction of emergency response agencies.

Ashley

5. Work Zone Management Project

1.1.5 Work Zone Management Project

Description: Work Zone Management will create an integrated implementation of technologies to improve the safety and efficiency of work zones. Centers include existing portable message signs, cameras to monitor traffic and operations in work zones, video broadcasts to inform travelers of maintenance and construction activities and potential delays, portable barriers that can be controlled by maintenance crews, and locally controlled signs to improve flow and manage traffic. The work zone management systems will be portable and allow for monitoring of conditions at the Traffic Operations Center.



Timeline: Near term (next three years)

Project Area: Work zones in the IIS Region

Lead/Contributor:

- City of Lawrence Municipal Services and Operations

Other Stakeholders:

- City of Lawrence Police
- Douglas County Emergency Communications
- Douglas County Public Works
- Douglas County Sheriff's Office
- KDOT
- KTA
- KU on Wheels
- Lawrence Transit
- Local Cities
- Local Cities Emergency Services
- KC Scout

Needs/Addressed:

- Improve/enhance work zone traffic handling plans.
- Increase use of portable traffic control equipment (Dynamic Message Signs, Highway Advisory Radio, etc.).

Other Stakeholders:

- MCD: [Maintenance and Construction Activity Coordination](#) - MCD: Work Zone Management
- MCD: [Maintenance and Construction Activity Coordination](#) - MCD: Work Zone Safety Monitoring

Estimated Cost: The estimated costs for work zone management assume each unit includes a video camera, highway advisory radio, portable Dynamic Message Sign, and portable Traffic Management System for a unit cost of \$102,000 to \$152,000. Work Zone Management may also require a software upgrade at the Traffic Operations Center to manage the mobile equipment at a cost of \$10,000 to \$22,000. **Total estimated cost for a work zone management system is \$102,000 to \$174,000.** This estimate is based on the federal ITS Knowledge database.

Performance Measures: The effectiveness of this project can be measured through the following measures:

- Reduced crashes and injuries in work zones.
- Traffic flow in work zones.
- Traffic delays in work zones.

follow up with darren - higher management convo

work zones are in GIS to divert emergency response in DCGO - see if Lawrence wants to do


DCGO - puts devices on contractor - traffic control plan as part of bid - smart could be expensive

C. Dynamic Message Signs Project, Fiber Communications Expansion Project, and Event and Incident Management Project

6. Dynamic Message Signs Project

1.1.6 Dynamic Message Signs Project

Description: This project will deploy approximately four permanent Dynamic Message Signs at strategic locations in the Region to aid in providing traffic information to the public and managing congestion and event traffic. The signs will be owned by KDOT and operated by the Department of Transportation. The City of Lawrence Traffic Operations Center and Operations and KTA will also be able to post messages to the signs from the City's Traffic Operations Center. The DMS will provide event, detour, parking and other information to travelers as they enter the City of Lawrence. Locations will be selected prior to critical level decision points to encourage travelers to take alternate routes when there is congestion or road work.



A camera will also be installed at each DMS location. The camera will be used to monitor the status of the DMS. They will also be able to provide traffic images to KC Scout, KTA and the City of Lawrence.

Timeline: Near term (next three years)

Project Area:

- Southbound I-68 south of the Turnpike
- Westbound I-68 east of the City
- Eastbound I-68 north of I-68
- Northbound I-68 south of the South Lawrence Freeway

Lead/Contributor:

- City of Lawrence Municipal Services and Operations
- KDOT
- KTA
- KC Scout

Needs/Addressed:

- Provide quality real-time congestion-related information.
- Improve traffic information dissemination.
- Provide better construction information and notification.
- Disseminate better information regarding limited alternative routes.
- Improve congestion management during seasonal/local events.

Other Stakeholders:

- ATADOC: [Transportation Operations Data Sharing](#) - This service package doesn't exist in IIS-DT. The service package uses the transportation operations data available in transportation system locations. The information from these systems, processes, and other information on traffic and road conditions and other information directly used in the transportation system and other systems. This information is used to improve incident response times and routing. The information is used to improve coordination of construction notification and information distribution. The information is used to improve coordination on road maintenance and construction activities. The information is used to improve coordination of maintenance activities prior to anticipated needs.

Estimated Cost: The estimated cost of the DMS and camera deployment is \$225,000 to \$300,000 per site, for a total estimated cost of \$900,000 to \$1,200,000. This estimate is based on the cost of KDOT's current DMS measurements.

Performance Measures: The effectiveness of this project can be measured through the following measures:

- Traffic flow during events.
- Level of usage of signs.
- Survey of travelers to determine changes in travel behavior.

Ashley -> Garry

7. Fiber Communications Expansion Project

1.1.7 Fiber Communications Expansion Project

Description: This project will expand the deployment of the Region's communications network that is available for the exchange of transportation data. It will primarily use fiber optic and use alternative data communications where fiber is not available or cost-effective. Alternative technologies may include cellular and microwave. The project is to increase the connectivity of devices and agencies in the Region for improved data collection, device management and information sharing. The City of Lawrence already has significant fiber connectivity, including to 31 signals and all of its traffic cameras. This project would require that network to integrate other agencies and devices. It is important to note that the deployment of fiber will be done with other stakeholders who also benefit from using the communications network.



Timeline: Medium term (three to six years)

Project Area:

- I-68/I-70 Head south to the South Lawrence Traffic Way
- I-68/I-70 Head north to I-68/I-70
- I-68/I-70 Head east to I-68/I-70
- I-68/I-70 Head west to I-68/I-70
- I-68/I-70 Head south to I-68/I-70
- I-68/I-70 Head north to I-68/I-70
- I-68/I-70 Head east to I-68/I-70
- I-68/I-70 Head west to I-68/I-70

Lead/Contributor:

- City of Lawrence Municipal Services and Operations

Other Stakeholders:

- Douglas County Public Works
- KTA
- KDOT
- University of Kansas
- KC Scout
- Private communications providers

Needs/Addressed:

- Provide quality real-time congestion-related information.
- Improve traffic information dissemination.
- Improve information sharing among agencies.
- Improve incident management.
- Improve inter-agency coordination.
- Improve incident response coordination among agencies.

Other Stakeholders:

- ATADOC: [Transportation Operations Data Sharing](#) - This service package doesn't exist in IIS-DT. The service package uses the transportation operations data available in transportation system locations. The information from these systems, processes, and other information on traffic and road conditions and other information directly used in the transportation system and other systems. This information is used to improve incident response times and routing. The information is used to improve coordination of construction notification and information distribution. The information is used to improve coordination on road maintenance and construction activities. The information is used to improve coordination of maintenance activities prior to anticipated needs.

Estimated Cost: The estimated cost of the Communications Expansion is:

- \$144,000 for I-68/I-70 Head south to the South Lawrence Traffic Way
- \$108,000 for I-68/I-70 Head north to I-68/I-70
- \$108,000 for I-68/I-70 Head east to I-68/I-70
- \$108,000 for I-68/I-70 Head west to I-68/I-70
- \$108,000 for I-68/I-70 Head south to I-68/I-70
- \$108,000 for I-68/I-70 Head north to I-68/I-70
- \$108,000 for I-68/I-70 Head east to I-68/I-70
- \$108,000 for I-68/I-70 Head west to I-68/I-70

Total estimated cost is \$864,000. This cost estimate has been developed by the City of Lawrence.

Performance Measures: The effectiveness of this project can be measured through the following measures:

- Number of devices connected.
- Number of agencies sharing information.
- Data exchange rates among devices and centers.

Micah

8. Event and Incident Management Project

1.1.8 Event and Incident Management Project

Description: This project will improve the real-time communication and coordination among emergency responders and Traffic Management to coordinate event and incident management plans, respond to incidents in real-time, and provide travelers with congestion, parking and alternative transportation mode information. The project will allow means for all agencies in the Region to exchange information as needed. KC Scout currently manages regional event and incident management in the Kansas City region and provides a full suite of services for the IIS Region to include, in addition, software used by KC Scout will be suitable for the IIS Region and provide interoperability among the regions.



Timeline: Medium term (three to six years)

Project Area: Lawrence-Douglas County Region

Lead/Contributor:

- Douglas County Emergency Communications

Other Stakeholders:

- City of Lawrence Police
- City of Lawrence Municipal Services and Operations
- Douglas County Public Works
- Douglas County Sheriff's Office
- KDOT
- KTA
- KU on Wheels
- KC
- Lawrence Transit
- Local Cities
- Local Cities Emergency Services
- KC Scout

Needs/Addressed:

- Improve incident management in urban areas.
- Improve incident response times.
- Improve incident management.
- Improve incident response coordination between agencies.
- Improve coordination of construction notification and information distribution.
- Provide quality real-time congestion-related information.
- Improve incident response to incidents and events.

Other Stakeholders:

- ATADOC: [Transportation Operations Data Sharing](#) - This service package doesn't exist in IIS-DT. The service package uses the transportation operations data available in transportation system locations. The information from these systems, processes, and other information on traffic and road conditions and other information directly used in the transportation system and other systems. This information is used to improve incident response times and routing. The information is used to improve coordination of construction notification and information distribution. The information is used to improve coordination on road maintenance and construction activities. The information is used to improve coordination of maintenance activities prior to anticipated needs.
- MCD: [Maintenance and Construction Activity Coordination](#) - MCD: Maintenance and Construction Activity Coordination

Estimated Cost: The estimated cost for this project includes improved software to detect incidents at the Traffic Operations Center, increased use of portable and fixed message signs, highway advisory radio and interagency data integration. **Costs of similar projects in other states have ranged from \$400,000 to \$2,000,000.** This estimate is based on the federal ITS Knowledge database.

Performance Measures: The effectiveness of this project can be measured through the following measures:

- Traffic flow during events.
- Level of usage of signs.
- Survey of travelers to determine changes in travel behavior.

Rob & Ashley check with EM

D. Transit Management Improvements, Transit Signal Priority Project, and Signal Beacons Project

9. Transit Management Improvements

1.1.9 Transit Management Improvements

Description: Transit Management Improvements will be a series of technology upgrades to both Lawrence Transit and 41 on Wheels vehicles. The improvements include systems that allow transit to better manage and plan its services through better data collection and analysis tools. Improved software will help develop more efficient and scheduling and route plans. Electronic fareboxes will reduce the use of cash on board and more efficiently collect fares, leading to potential cost savings at stops. The electronic fareboxes will also be linked to the existing transit card data on identity by route, location and time.

Duration: Medium term (three to six years)

Geographic Area: City of Lawrence

Lead jurisdiction: City of Lawrence

Other jurisdictions: Lawrence Transit, 41 on Wheels

Needs Addressed:

- Automate passenger counting
- Improve service planning (scheduling, routing)
- Improve fare payment systems

Benefits/Advantages:

- ATM10: Transit Fleet Management, ATM11: Transit Fleet Management, ATM12: Transit Fleet Management, ATM13: Transit Fleet Management, ATM14: Transit Fleet Management, ATM15: Transit Fleet Management, ATM16: Transit Fleet Management, ATM17: Transit Fleet Management, ATM18: Transit Fleet Management, ATM19: Transit Fleet Management, ATM20: Transit Fleet Management

Estimated Cost: The estimated cost of the transit management improvements includes approximately \$11,000 to \$14,000 per vehicle for on-board technology that includes electronic fareboxes, and \$60,000 to \$100,000 for improved fleet route management software. The cost also includes an estimated \$1,000 to \$1,500 per vehicle for transit information onboard vehicles through signs or audio. **The total estimated cost is \$100,000 to \$160,000.**

Performance Measures: The effectiveness of this project can be measured through the following measures:

- Transit ridership
- Operations cost per transit trip
- Turns of transit passenger satisfaction

Adam/Quiz

10. Transit Signal Priority Project

1.1.10 Transit Signal Priority Project

Description: The Transit Signal Priority will equip Lawrence Transit fleet with buses with a device that alerts a traffic signal controller that the bus is present and would like an early or extended green light. The signal controller, or Traffic Operations Center, determines whether to modify the signal cycle at the intersection in order to expedite the bus movement through the intersection. Transit Signal Priority will only be deployed at signal intersections where the location of which has not been determined. The purpose of signal priority is to help prevent buses from being delayed or overrunning the Center, as well as to keep buses on schedule and ensure transfer connections can be made. Transit Signal Priority requests from buses may be based on a variety of factors that include a bus's current adherence to schedule, the location of the bus on the line, or the headway between buses on the same route. Note that this project will require a review of the local City law regarding the use of devices to provide green lights to vehicles.

Duration: Medium term (three to six years)

Geographic Area: Lawrence Transit Center (location to be determined)

Lead jurisdiction: Lawrence Transit

Other jurisdictions: City of Lawrence Municipal Services and Operations

Needs Addressed:

- Reduce transit vehicle delay at key intersections

Benefits/Advantages:

- ATM10: Transit Signal Priority, ATM11: Transit Signal Priority, ATM12: Transit Signal Priority, ATM13: Transit Signal Priority, ATM14: Transit Signal Priority, ATM15: Transit Signal Priority, ATM16: Transit Signal Priority, ATM17: Transit Signal Priority, ATM18: Transit Signal Priority, ATM19: Transit Signal Priority, ATM20: Transit Signal Priority

Estimated Cost: The estimated cost of this project includes on-board technology ranging in cost from \$800 to \$1,500 per vehicle, and intersection control hardware and software that ranges from \$10,000 to \$100,000. Assuming 20 vehicles and an 80% intersection, the estimated total cost is \$48,000 to \$100,000. This estimate is based on the latest ITS Knowledge Database.

Performance Measures: The effectiveness of this project can be measured through the following measures:

- Transit ridership
- Transit vehicle reliability
- Schedule adherence
- Impact on traffic flow and congestion

Adam

11. Signal Beacons Project

1.1.11 Signal Beacons Project

Description: The Signal Beacons Project provides a low-cost solution to provide travelers with advance notice of adverse conditions. The beacons will be located along the roadway at points of safety concern, such as potential roadway flooding locations, or at upcoming traffic signals that a driver should be made aware of. The beacons will be connected to other road devices. For example, a flood warning beacon will be connected to a weather sensor that detects heavy rain on the roadway. The beacon will trigger when the sensor detects water higher than a preset threshold. In the case of a traffic signal warning beacon, the beacon may only start flashing when the signal has an approaching red light. It may only start flashing at all times of the presence of the signalized intersection ahead.

Duration: Medium term (three to six years)

Geographic Area: Locations throughout the Lawrence-Douglas County Region

Lead jurisdiction: City of Lawrence Municipal Services and Operations

Other jurisdictions: Douglas County Public Works, 41 on Wheels

Needs Addressed:

- Improve incident detection
- Improve road/weather condition information
- Improve ability to monitor and provide information about flooding

Benefits/Advantages:

- ATM10: Signal Beacons, ATM11: Signal Beacons, ATM12: Signal Beacons, ATM13: Signal Beacons, ATM14: Signal Beacons, ATM15: Signal Beacons, ATM16: Signal Beacons, ATM17: Signal Beacons, ATM18: Signal Beacons, ATM19: Signal Beacons, ATM20: Signal Beacons

Estimated Cost: The estimated cost of this project is approximately \$7,000 to \$10,000 per site for roadway and environmental sensors, and for the flashing beacons that is triggered by the sensor. Costs may vary based on the availability of power and communication at beacon sites. **The total estimated cost for twelve sites is \$84,000 to \$120,000.** This estimate is based on the latest ITS Knowledge Database.

Performance Measures: The effectiveness of this project can be measured through the following measures:

- Reduction in non-crash accidents
- Reduction in travel time
- Change in road behavior

Nick

E. Parking Management Systems Project, Emergency Signal Preemption Improvements Project, and Bicycle/Pedestrian Warning Systems Project

12. Parking Management Systems Project

1.1.12 Parking Management Systems Project

Description: This project will improve the management of parking in the City of Lawrence and on the 41 on Wheels through the use of advanced technologies to help manage and plan its services through better data collection and analysis tools. Improved software will help develop more efficient and scheduling and route plans. Electronic fareboxes will reduce the use of cash on board and more efficiently collect fares, leading to potential cost savings at stops. The electronic fareboxes will also be linked to the existing transit card data on identity by route, location and time.

Duration: Medium term (three to six years)

Geographic Area: City of Lawrence Municipal Services and Operations, 41 on Wheels

Lead jurisdiction: City of Lawrence Municipal Services and Operations, 41 on Wheels

Other jurisdictions: Lawrence Transit, 41 on Wheels

Needs Addressed:

- Improve parking management and parking information

Benefits/Advantages:

- ATM10: Parking Management, ATM11: Parking Management, ATM12: Parking Management, ATM13: Parking Management, ATM14: Parking Management, ATM15: Parking Management, ATM16: Parking Management, ATM17: Parking Management, ATM18: Parking Management, ATM19: Parking Management, ATM20: Parking Management

Estimated Cost: The estimated cost of this project is between \$700,000 and \$1,000,000. The cost is based on up to five parking management systems and a payment system at the knowledge database or each facility. The estimated cost is based on the range of costs for similar recent deployments reported in the latest ITS Knowledge Database.

Performance Measures: The effectiveness of this project can be measured through the following measures:

- Parking usage
- Parking revenue
- Traffic congestion during events

Quiz, Adam/Brad

13. Emergency Signal Preemption Improvements Project

1.1.13 Emergency Signal Preemption Improvements Project

Description: The Emergency Signal Preemption Project will equip the Lawrence-Douglas County Fire/Police vehicles with a device that alerts a traffic signal controller that the vehicle is present and would like an early or extended green light. The signal controller, or Traffic Operations Center, determines whether to modify the signal cycle at the intersection in order to expedite the vehicle movement through the intersection. The signal controller will only be deployed at signal intersections where the location of which has not been determined. The purpose of signal preemption is to help prevent vehicles from being delayed or overrunning the Center, as well as to keep vehicles on schedule and ensure transfer connections can be made. Signal preemption requests from vehicles may be based on a variety of factors that include a vehicle's current adherence to schedule, the location of the vehicle on the line, or the headway between vehicles on the same route. Note that this project will require a review of the local City law regarding the use of devices to provide green lights to vehicles.

Duration: Long term (six to ten years)

Geographic Area: Lawrence throughout the City of Lawrence

Lead jurisdiction: Lawrence-Douglas County Fire/Police

Other jurisdictions: City of Lawrence Municipal Services and Operations

Needs Addressed:

- Reduce emergency vehicle delay at key intersections
- Enable remote emergency control of signals

Benefits/Advantages:

- ATM10: Emergency Signal Preemption, ATM11: Emergency Signal Preemption, ATM12: Emergency Signal Preemption, ATM13: Emergency Signal Preemption, ATM14: Emergency Signal Preemption, ATM15: Emergency Signal Preemption, ATM16: Emergency Signal Preemption, ATM17: Emergency Signal Preemption, ATM18: Emergency Signal Preemption, ATM19: Emergency Signal Preemption, ATM20: Emergency Signal Preemption

Estimated Cost: The estimated cost of this project includes on-board technology ranging in cost from \$800 to \$1,500 per emergency vehicle, and intersection control hardware and software that ranges from \$10,000 to \$100,000. Assuming 20 vehicles and an 80% intersection, the estimated total cost is \$48,000 to \$100,000. This estimate is based on the latest ITS Knowledge Database.

Performance Measures: The effectiveness of this project can be measured through the following measures:

- Incident response times
- Impact on traffic flow and congestion

Rob

14. Bicycle/Pedestrian Warning Systems Project

1.1.14 Bicycle/Pedestrian Warning Systems Project

Description: Bicycle/Pedestrian Warning Systems will provide advanced notice of the presence of bicycles and pedestrians on or near the roadway to traffic. This will improve awareness by drivers and the safety of bicycles and pedestrians. The systems will be installed in locations with heavy pedestrian and bicycle traffic, such as downtown Lawrence area. The systems will automatically trigger when a bicycle or pedestrian is detected, such as a flashing beacon or light embedded in the roadway. The systems may also automatically trigger when a bicycle or pedestrian is present.

Duration: Long term (six to ten years)

Geographic Area: Locations throughout the City of Lawrence

Lead jurisdiction: City of Lawrence Municipal Services and Operations

Other jurisdictions: Trailing Public

Needs Addressed:

- Improve bicycle/pedestrian warning systems

Benefits/Advantages:

- ATM10: Bicycle/Pedestrian Warning, ATM11: Bicycle/Pedestrian Warning, ATM12: Bicycle/Pedestrian Warning, ATM13: Bicycle/Pedestrian Warning, ATM14: Bicycle/Pedestrian Warning, ATM15: Bicycle/Pedestrian Warning, ATM16: Bicycle/Pedestrian Warning, ATM17: Bicycle/Pedestrian Warning, ATM18: Bicycle/Pedestrian Warning, ATM19: Bicycle/Pedestrian Warning, ATM20: Bicycle/Pedestrian Warning

Estimated Cost: The estimated cost of a bicycle/pedestrian detection system is approximately \$1,000 per intersection. The cost for a pedestrian crossing detection system is \$20,000 to \$30,000 per location. Assuming twelve intersections with detection and four pedestrian crossings, the total estimated cost for this project is \$100,000 to \$120,000. This estimate is based on the latest ITS Knowledge Database.

Performance Measures: The effectiveness of this project can be measured through the following measures:

- Reduction in bicycle/pedestrian crashes
- Impact on traffic flow and congestion

Dustin

F. Weather Monitoring Project, Regional Virtual Data Warehouse Project, and Journey Trip Planner Project

15. Weather Monitoring Project

Program: 3rd party creator, not us

1.1.15 Weather Monitoring Project

Description: This project will deploy next weather sensors in the Region to improve the monitoring and response to weather conditions. The weather sensors will be able to collect wind, precipitation, images of the roadway, ambient conditions and air or noise concentrations. Information collected from the sensors throughout the Region will be shared to provide maintenance crews the ability to detect conditions at sensitive locations, and be able to plan and respond to severe weather. The information can be used to determine what and how many winter maintenance vehicles to deploy, and what types of materials will be needed to treat the roadways for travel. The information may also be used by the 911 Dispatch center to identify conditions and provide better routing to emergency vehicles.

Timeline: Long term (six to ten years)

Project Address: Lawrence Douglas County Region

Lead/Responsible: City of Lawrence Municipal Services and Operations

Other Stakeholders: Douglas County Emergency Communications Center, Douglas County Public Works, KDOT

1.1.15.1 Scope Package: WMSD **WMSD (Weather, Monitoring, Detection, Data Collection)** This service package doesn't exist in RADOT. The full definition is beyond. The service package covers current use and weather condition analysis, collection, storage, processing, dissemination, and distribution of weather data to various users of the system. The data is processed and stored in a central database. The data is processed and stored in a central database. The data is processed and stored in a central database.

Estimated Cost: The estimated cost of the environmental weather actions including sensors is \$35,000 to \$60,000 per year. The estimated cost of the software and processing next weather information is approximately \$20,000. Assuming all stations in the Region, the **total estimated cost is \$200,000 to \$300,000.** This estimate is based on the latest ITS Knowledge database.

Performance Measures: The effectiveness of this project can be measured through the following measures:
 • Time to clear roadways
 • Usage of maintenance equipment and materials
 • Incident response time

Creator: Caleb/Nick

16. Regional Virtual Data Warehouse Project

1.1.16 Regional Virtual Data Warehouse Project

Description: This project will develop a virtual method for agencies to share traffic, maintenance and incident information. The Virtual Data Warehouse does not create a centralized location for data storage. Instead, each agency maintains its own data, but is able to share the data it shares with other agencies through a Regional Integration System. Data may include both historic and real-time data such as signal timing, incident response and other inputs. Authorized agencies will be able to call the information and images for managing traffic and incidents, and for maintenance planning. Key functions of the virtual warehouse will be to provide a centralized format for sharing and retrieving Regional data in order to make it usable and to ensure that all regional jurisdictions are using the same information for their operations. The data will also have the potential for sharing with the general public.

Timeline: Long term (six to ten years)

Project Address: Lawrence Douglas County Region

Lead/Responsible: City of Lawrence Municipal Services and Operations

Other Stakeholders: City of Lawrence Police, Douglas County Emergency Communications, Douglas County Public Works, Douglas County Sheriff's Office, KDOT, KTA, Lawrence Transit, Loud Cities, Loud Cities Emergency Services

1.1.16.1 Scope Package: WMSD **WMSD (Weather, Monitoring, Detection, Data Collection)** This service package doesn't exist in RADOT. The full definition is beyond. The service package covers current use and weather condition analysis, collection, storage, processing, dissemination, and distribution of weather data to various users of the system. The data is processed and stored in a central database. The data is processed and stored in a central database. The data is processed and stored in a central database.

Estimated Cost: The estimated cost of this project varies depending upon the level of deployment and identification of data in the Region. The cost of similar efforts in other parts of the United States ranged from a low of \$50,000 to a high of \$500,000. A budget for cost for an effort that is relatively high level of effort to best operational state deployment. This estimate is based on the latest ITS Knowledge database.

Performance Measures: The effectiveness of this project can be measured through the following measures:
 • Amount of Regional information available to agencies
 • Amount of Regional information available to the public

Creator: Mike Fioberg

17. Journey Trip Planner Project

1.1.17 Journey Trip Planner Project

Description: The Journey Trip Planner will be an online tool available to travelers through their computers and personal devices that allow them to plan their trip using one or more modes, including personal vehicle, transit, bicycle and pedestrian. The Journey Trip Planner will be intuitive and allow the user to enter their origin and destination as well as the planned time of travel and preferred modes of travel. The Trip Planner will provide information such as traffic conditions, real-time parking availability, lodging, activities and costs for various modes. The Trip Planner can encourage travelers to use transit, expand on park-and-ride facilities and complete trips by foot, bicycle and for errands and commutes.

Timeline: Long term (six to ten years)

Project Address: Lawrence Douglas County Region

Lead/Responsible: City of Lawrence Municipal Services and Operations

Other Stakeholders: Douglas County Public Works, KDOT, KTA, Lawrence Transit, Loud Cities, Loud Cities Emergency Services

1.1.17.1 Scope Package: WMSD **WMSD (Weather, Monitoring, Detection, Data Collection)** This service package doesn't exist in RADOT. The full definition is beyond. The service package covers current use and weather condition analysis, collection, storage, processing, dissemination, and distribution of weather data to various users of the system. The data is processed and stored in a central database. The data is processed and stored in a central database. The data is processed and stored in a central database.

Estimated Cost: The estimated cost of similar projects in the United States have ranged from approximately \$100,000 to \$575,000 for hardware, software and equipment. Additional hardware, such as GPS or mobile can significantly increase the overall project cost. For the LDC Region, it is assumed that GPS devices in previous projects will be used, and the **total estimated cost is \$200,000 to \$375,000.** This estimate is based on the latest ITS Knowledge database.

Performance Measures: The effectiveness of this project can be measured through the following measures:
 • Use of modes other than personal vehicles
 • Average travel time in the Region

Creator: Ashley

G. Traffic Detection Improvements Project, Connected Vehicles – Need to update, and Any New Projects to Include?

18. Traffic Detection Improvements Project

Program: 3rd party creator, not us

1.1.18 Traffic Detection Improvements Project

Description: The Traffic Detection Improvements Project will replace existing traffic detection devices with advanced detection equipment at intersections to better classify vehicles and pedestrians and provide better response. The improved detection equipment may include video detection or other devices that can not only detect the presence of vehicles, but also be able to identify what types of vehicles they are, including commercial trucks and buses. The detection equipment may also be able to identify and classify pedestrians and bicycles at intersections. Once bicycles and pedestrians are detected, the intersection can respond accordingly by providing a green when only a bicycle is present, or automatically triggering a walk sign for the pedestrian. The Traffic Detection Improvements Project can be coordinated with the Bicycle/Pedestrian Warning Systems Project to detect bicycles and pedestrians.

Timeline: Long term (six to ten years)

Project Address: City of Lawrence

Lead/Responsible: City of Lawrence Municipal Services and Operations

1.1.18.1 Scope Package: ATMSD **ATMSD (Automated Traffic Monitoring System)** This service package doesn't exist in RADOT. The full definition is beyond. The service package includes traffic detectors, other surveillance equipment, and processing hardware, and provides management functionality to the system. The data is processed and stored in a central database. The data is processed and stored in a central database. The data is processed and stored in a central database.

Estimated Cost: The estimated cost of video detection at intersections is approximately \$20,000 to \$40,000 per intersection. The hardware and software to process traffic information from image and data to manage signal is \$20,000 to \$30,000. Assuming twenty intersections will be included, the **total cost of this project is estimated to be \$370,000 to \$1,400,000.** This estimate is based on the latest ITS Knowledge database.

Performance Measures: The effectiveness of this project can be measured through the following measures:
 • Traffic flow at intersections
 • Reduced bicycle/pedestrian crashes

Creator: Nick

19. Connected Vehicles - Need to update

1.1.19 Connected Vehicles - update

The ITS Project identified in the plan encompasses the plans of the LDC Region as of 2015. It is important to note that transportation technologies are rapidly evolving and the Region should be aware of changes that are coming from both the public and private sectors. Specifically, the transition to "connected vehicles" may significantly impact the way vehicles and the transportation network interact. Figure 17 provides a conceptual illustration of connected vehicles.

Figure 1: Conceptual Image of Connected Vehicles

self driving vehicles preparation

no legislature to do anything yet. KDOT is working on connected vehicle programs

\$2 mill per year to do innovative technology solutions

Federal Connected Vehicle Research can be viewed at the [United States Department of Transportation, ITS Joint Program Office web site](https://www.dot.gov/connected-vehicle/connected_vehicle_research.htm). The following excerpt highlights the connected vehicle research.

1.19.1 Critical Improvements are needed to make surface transportation safer, smarter, and greener and ultimately enhance mobility for Americans. Part of this transformation to our transportation system can be achieved through connectivity. Connected vehicles have the potential to transform the way decisions are made through the creation of a safe, interoperable, wireless communication network that includes cars, buses, trucks, trains, traffic lights, toll plazas, and other devices. Use the network, which provides information connectivity, connected vehicle technology provides a starting point for transportation connectivity that will potentially enable countless applications and save our nations.

Connected vehicle applications provide connectivity:

- Among vehicles to enable crash prevention
- Between vehicles and the infrastructure to enable safety, mobility, and environmental benefits
- Among vehicles, infrastructure, and wireless devices to provide continuous real-time connectivity to a system users.

Creator: Ashley

Any New Projects to Include?

Future Shared Mobility (scooters, etc)

Electric vehicle infrastructure

Vehicle-to-Pedestrian Communications: https://www.fhwa.dot.gov/cta/tech/v2p/v2pcomm.htm

Creator: Ashley

Creator: Nick

Creator: Mike Person to Update: Ashley

H. Next Meeting – Meeting adjourned at 2:54 pm.

- a. Meeting 3 – April 13 @ 10:30
 - i. Prepare for the meeting by gathering information and updating existing and future projects discussed in the meeting.
 - ii. Provide comments on project word documents or on Mural by 5 pm on April 5.
- b. Meeting 4 – April 26 @ 1:30

Intelligent Transportation System (ITS) Plan Update

Task	March 4 @ 1:30 - 3:00	March 29 @ 1:30 - 3:00	April 13 @ 10:30 - Noon	April 26 @ 1:30 - 3:00	May	June
Development						
Steering Committee	Kickoff	Meeting 2	Meeting 3	Meeting 4		
Meeting Topic	Overview, Discuss ITS needs, & Verify goals (T2040 & ITS)	Discuss projects (new & old)	Discuss timeline, priorities & necessary agreements	Review draft plan		
Homework	Review & comment on ITS needs & Review existing projects for Meeting 2	Provide any further comments on projects	Review & comment on necessary agreements	Review & comment on draft plan		
Review						
15-day public comment period					Anticipated - May 6 - May 21*	
Document public comments & make necessary edits					X	
TAC/MPO Policy Board consideration of ITS Plan						Anticipated - June 1 & June 17*
Pending Policy Board approval post online and send to KDOT, FHWA, and FTA						X

* Anticipated dates. The final dates depend on how the planning process advances.

2.25.21

** Public participation process includes: Newspaper advertisement, email to subscription list, place document online and at public locations - Baldwin City Public Library, Eudora City Hall, Lawrence Public Library, Lecompton City Hall, and MPO Office, send to TAC and Policy Board for review

L-DC Region ITS Projects

Table 10 lists the sequenced ITS projects for the L-DC Region. The inclusion of a project in this list does not mean that it has been programmed in other regional transportation plans. Neither do the vast majority of Projects on this list have committed funding. This Plan is a means for identifying potential ITS Projects that should be considered and possibly programmed into the Region’s funding processes.

One ITS Project identified in this Plan is an exception. The Signal Coordination and Control Project has been funded and is in development at the City of Lawrence. Funding for the Project has been programmed through City and KDOT ITS Set-Aside funds.

It should also be noted that cost estimates for near-term projects are more precise than the estimates for the medium-term and long-term projects. Near-term projects assume the use of current technologies whose costs are better known. Medium-term and long-term projects are not as clearly defined because stakeholder participation has not been committed, and technologies may change before the projects are designed.

Near-term <i>(planned for the next three years)</i>	1. Signal Coordination Program
	2. Camera Deployment Program
	3. Transit Traveler Information Improvements
	4. Interagency Information Sharing
	5. Work Zone Management (possibly integrated with #8 Event and Incident Management Improvements)
	6. Dynamic Message Signs
Medium-term <i>(planned for three to six years)</i>	7. Fiber Communications Expansion Program
	8. Event and Incident Management Improvements
	9. Transit Management Improvements
	10. Lawrence Transit Signal Priority
	11. Signal Beacon Deployment
	12. Parking Management System
Long-term <i>(planned for six to ten years)</i>	13. Emergency Signal Preemption Improvements
	14. Bicycle/Pedestrian Warning Systems Program
	15. Weather Monitoring Program
	16. Regional Virtual Data Warehouse
	17. Journey Trip Planner
	18. Traffic Detection Improvements Program
	19. Connect Vehicles
	20. Future Shared Mobility (scooters, etc.)
	21. Electric Vehicle Infrastructure

1. L-DC Region ITS Project Interagency Agreements

Agreements among the stakeholder agencies and organizations in the L-DC Region may be required to realize the integration proposed in the ITS Architecture. Each connection between systems owned by different Stakeholders represents cooperation among Stakeholders and a potential need for an agreement.

One of the first steps of any ITS Project development should be to review existing Stakeholder agreements that support sharing information, funding, or specific ITS projects. The review should assess if the existing agreements can be extended and used to support the cooperative implementation and operation of ITS in the region. The L-DC Region's existing interagency agreements may already address some of the agreements identified in this Plan.

The list of the necessary L-DC Region ITS Project agreements was developed based on the stakeholder roles and responsibilities, awareness of the types of existing or planned ITS for implementation by the region, and the information that will be exchanged among systems for the ITS Projects.

1.1 Agreement Types

There is a wide range of agreement types that may be necessary to develop and implement an ITS project. The nature of existing interagency relationships and existing "local practices" may influence the types of agreements various agencies enter into. For example, two agencies that are co-located or frequently work together may have a working relationship that simplifies the need for detailed agreements. Other Stakeholders, brought together for the first time by an ITS Project, may need a more clearly defined agreement that helps each understand the responsibilities and capabilities of each Stakeholder.

Table 9 contains descriptions of common types of agreements relevant to the Region's ITS projects as identified in the *FHWA Regional ITS Architecture Guidance Document*.

Table 9: Common ITS Project Agreement Types

Type of Agreement	Description
Handshake Agreement	<ul style="list-style-type: none"> • Early agreement between one or more partners. • Not recommended for long term operations. • Does not require formal documentation.
Memorandum of Understanding (MOU)	<ul style="list-style-type: none"> • Initial agreement used to provide minimal detail and usually demonstrates a general consensus. • Used to expand a more detailed agreement like an Interagency Agreement, which may be broad in scope but contains all of the standard contract clauses required by a specific agency. • May serve as a means to modify a much broader agreement, allowing the master agreement to cover various ITS projects throughout the region and the MOUs to specify the scope and differences between the projects.
Interagency Agreement (IA)	<ul style="list-style-type: none"> • Between local public agencies (e.g. transit authorities, cities, counties, etc.) for operations, services, or funding. • Documents responsibility, functions, and liability at a minimum.
Operational Agreement (OA)	<ul style="list-style-type: none"> • Between any agency involved in funding, operating, maintaining or using the right-of-way of another public or private agency. • Identifies respective responsibilities for all activities associated with shared systems being operated and/or maintained.
Funding Agreement (FA)	<ul style="list-style-type: none"> • Documents the funding arrangements for ITS projects (and other projects). • Includes at a minimum standard funding clauses, detailed scope, services to be performed, detailed project budgets, etc.
Master Agreements (MA)	<ul style="list-style-type: none"> • Standard contract and/or legal verbiage for a specific agency and serves as a master agreement by which all business is done. It can be found in the legal department of many public agencies • Allows states, cities, transit agencies, and other public agencies that do business with the same agencies over and over (e.g., cities and counties) to have one Master Agreement that uses smaller agreements (e.g., MOUs, Scope-of-Work and Budget Modifications, Funding Agreements, Project Agreements, etc.) to modify or expand the boundaries of the larger agreement to include more specific language

1.2 Agreement Focus

Rather than focus on specific technologies in an agreement, the focus is typically on the scope-of-service and specific agency responsibilities for various components of the service. The agreement should also describe the high-level information that each agency needs to exchange in order to meet the objectives of the ITS Project. The agreement should not focus on how the delivery of that information will occur.

A simple handshake agreement may be enough for some L-DC Region ITS planning activities. Once interconnections and integration of systems occur, however, agencies may want a more formal agreement in place to document items such as how operations will occur and who will maintain the system. Documented agreements will aid agencies in planning their operational costs, understanding their respective roles and responsibilities, and in building trust for future projects. Formal agreements are necessary where funding or financial arrangements are defined, or where participation in large regionally-significant projects is required.

1.3 Needed L-DC ITS Project Agreements

A few ITS Projects planned for the L-DC Region do not require agreements because they involve a single Stakeholder or involve multiple agencies each acting independently. The projects that are not foreseen as requiring Stakeholder agreements are:

- Work Zone Management
- Transit Traveler Information Improvements
- Transit Management Improvements
- Signal Beacons
- Bicycle/Pedestrian Warning Systems
- Traffic Detection Improvements

The ITS Projects listed in Table 10 involve two or more Stakeholders, where agreements will be needed. For most Projects, it is recommended that a Memorandum of Understanding (MOU) be the first step in project planning. The purpose of an initial MOU is to confirm that all Stakeholders are in support of the project and in agreement on what the objectives are. Stakeholders becoming a party to the MOU will then pursue further agreements, as needed, for development, deployment, operations, and funding. In some cases, an MOU is not listed as needed. These ITS Projects are generally those with clear objectives or among Stakeholders with an existing working relationship.

Table 10: L-DC Regional ITS Architecture Agreement Types

L-DC Region ITS Project	Stakeholders	Agreement Type(s)	Agreement Objectives
<p>Signal Coordination and Control Expansion</p>	<ul style="list-style-type: none"> • City of Lawrence Municipal Services and Operations (lead) • KDOT 	<ul style="list-style-type: none"> • Interagency Agreement 	<p>IA: The IA may incorporate the funding arrangement that describes the role of funding provided by the participating Stakeholders. The IA may also include the expectations of each agency for the operation and use of the expanded signal control, and how the Project’s performance will be measured. Because the project includes cameras, the IA may indicate KDOT and the City’s expectations for sharing images with other agencies and the public.</p>
<p>Camera Sharing</p>	<ul style="list-style-type: none"> • City of Lawrence Municipal Services and Operations (lead) • City of Lawrence Police • Douglas County Emergency Communications • KTA • KDOT • KC Scout 	<ul style="list-style-type: none"> • MOU • Interagency Agreement 	<p>MOU: Because the City of Lawrence will be solely responsible for deploying upgraded software and the operation and maintenance of the cameras, a simple MOU is recommended among agencies to agree upon the sharing of images from the cameras. The MOU may describe the expectation of the City in how other agencies use the images, and the agencies’ expectation of availability of camera images.</p> <p>IA: The IA should describe specifically how agencies will connect to the camera software, such as through a direct connection with the Traffic Operations Center, or via a private or public web site. The IA may also include any funding arrangements that describe the sharing of costs for operating and maintaining the camera sharing software.</p>
<p>Transit Traveler Information</p>	<ul style="list-style-type: none"> • KU on Wheels (co-lead) • Lawrence Transit (co-lead) • City of Lawrence Municipal Services and Operations 	<ul style="list-style-type: none"> • IA 	<p>IA: The IA should address access to power and communications at the roadside needed by the transit agencies to connect digital signs. The IA should identify the specific locations, the type of power required and access to communications. The IA should also clearly indicate the responsibility for the costs of using power and communications.</p>

L-DC Region ITS Project	Stakeholders	Agreement Type(s)	Agreement Objectives
<p>Inter-agency Information Sharing</p>	<ul style="list-style-type: none"> • City of Lawrence Municipal Services and Operations (lead) • City of Lawrence Police • Douglas County Emergency Communications • Douglas County Public Works • Douglas County Sheriff's Office • KDOT • KTA • KU on Wheels • University of Kansas • Lawrence Transit • Local Cities • Local Cities Emergency Services • KC Scout 	<ul style="list-style-type: none"> • Memorandum of Understanding • Interagency Agreement 	<p>MOU: The MOU should be used in describing how emergency responders and transportation management agencies will coordinate to share resources and information. A key element of this MOU should be defining at a high-level the types of information that will be shared, and how they will be used. In addition, if emergency responders will have some say in how traffic is managed during emergencies, the MOU should describe the level of input and how instructions should be exchanged.</p> <p>IA: An incrementally developed IA should address how agencies will actually work together for information sharing, operations, etc. The primary purposes of the agreement are to describe agency expectations and roles for information and resource sharing across jurisdictional boundaries.</p>

L-DC Region ITS Project	Stakeholders	Agreement Type(s)	Agreement Objectives
Dynamic Message Signs	<ul style="list-style-type: none"> • City of Lawrence Municipal Services and Operations (lead) • KDOT • KTA • KC Scout 	<ul style="list-style-type: none"> • MOU • Interagency Agreement 	<p>MOU: The four proposed DMS will be controlled by KC Scout but with considerable input from the City of Lawrence and KTA. An MOU will be needed to define the types of messages each agency may place on the signs, the hierarchy of authority for the signs, and the shared expectations for the signs in performing traffic, event and incident management. The MOU is critical because the City and KC Scout currently do not jointly operate any devices in the Region.</p> <p>IA: The IA should describe specifically how agencies will connect to the signs, either directly or through the DMS. The IA should also establish funding arrangements for operating and maintaining the signs and the software required to control them.</p>
Communications Expansion	<ul style="list-style-type: none"> • City of Lawrence Municipal Services and Operations (lead) • Douglas County Public Works • KDOT • KTA • University of Kansas • KC Scout • Private communications providers 	<ul style="list-style-type: none"> • Interagency Agreement • Operating Agreement 	<p>IA: The IA should address the access of each agency to the communications network, the bandwidth available to each agency, and the agencies' authority to connect devices. The IA may also address issues such as right-of-way access for installation and maintenance of communications hardware.</p> <p>OA: The OA should address the ongoing maintenance and operation of the communications network. It may include the expectations of the agencies and private communications providers to keep the system operational, and the expectations of stakeholders in performing other roadway construction and maintenance that may impact the network. The OA may also address the sharing of fiber and how the strands may be distributed by Stakeholder or function.</p>

L-DC Region ITS Project	Stakeholders	Agreement Type(s)	Agreement Objectives
Event and Incident Management	<ul style="list-style-type: none"> • Douglas County Emergency Communications (lead) • City of Lawrence Police • City of Lawrence Municipal Services and Operations • Douglas County Public Works • Douglas County Sheriff's Office • KDOT • KTA • KU on Wheels • KU • Lawrence Transit • Local Cities • Local Cities Emergency Services • KC Scout 	<ul style="list-style-type: none"> • Interagency Agreement 	<p>IA: An IA may be the only agreement required for this Project because the MOU established for the Interagency Information Sharing Project has established the roles and responsibilities of the Stakeholders. The IA should address the standards and formats agreed to for the electronic exchange of event and incident information. The IA should also establish any platform or software that will be used by all participating Stakeholders. In addition, the IA should address the funding needed to purchase the software, develop a plan and operate and maintain information sharing systems.</p>
Transit Signal Priority	<ul style="list-style-type: none"> • Lawrence Transit (lead) • City of Lawrence Municipal Services and Operations 	<ul style="list-style-type: none"> • Memorandum of Understanding • Interagency Agreement 	<p>MOU: The MOU should address expectations and roles regarding priority signal control for Lawrence Transit. The MOU should define preliminary goals and system functional requirements.</p> <p>IA: The IA is needed to formally document how the signal priority system will work, to exclude unauthorized users, and to report system usage and impact on timing plans. The IA may include funding, depending on the source of funds and how costs are distributed between controller hardware/software upgrades, on-bus equipment, and Traffic Operations Center improvements.</p>

L-DC Region ITS Project	Stakeholders	Agreement Type(s)	Agreement Objectives
Parking Management Systems	<ul style="list-style-type: none"> • City of Lawrence Municipal Services and Operations (co-lead) • KU Parking and Transit (co-lead) 	<ul style="list-style-type: none"> • Memorandum of Understanding • Interagency Agreement 	<p>MOU: The MOU should outline the roles and responsibilities of the City and KU in collecting and sharing parking information. The MOU should also provide basic guidelines that define the types of parking management systems to be implemented in order to ensure interoperability and similar data collection.</p> <p>IA: The IA should establish how information will be exchanged between the parking systems and the Traffic Operations Center, or with traveler information systems and a virtual regional data warehouse. The IA should also describe how data will be used by each stakeholder, and interagency operation of parking facilities during events.</p>
Emergency Signal Preemption Upgrade	<ul style="list-style-type: none"> • Lawrence-Douglas County Fire Medical (lead) • City of Lawrence Municipal Services and Operations 	<ul style="list-style-type: none"> • Interagency Agreement 	<p>IA: Any existing agreement between the City and Fire Medical addresses how emergency signal preemption is used in the City of Lawrence. That agreement can remain in place to describe each agency's roles and responsibilities and when signal preemption is used. An IA is needed to define the technology that will be used in the improved signal preemption. It will describe what is expected of the City to implement wireless communications with fire and medical vehicles, and the system that will be deployed on-board vehicles.</p>

L-DC Region ITS Project	Stakeholders	Agreement Type(s)	Agreement Objectives
Weather Monitoring	<ul style="list-style-type: none"> • City of Lawrence Municipal Services and Operations (lead) • Douglas County Emergency Communications Center • Douglas County Public Works • KDOT • KTA 	<ul style="list-style-type: none"> • Memorandum of Understanding • Interagency Agreement 	<p>MOU: The MOU should define the roles and responsibilities of each stakeholder, and define the purpose of the deployment of multiple weather sensors in the Region. The MOU should also identify the agreed upon data to be collected and how it will be shared among the participating Stakeholders. The MOU should also address the type of sensors to be deployed by multiple agencies to ensure interoperability with central software.</p> <p>IA: The IA should address specific standards and data formats to be collected and exchanged by the weather sensors. The IA should also define who will operate the central software and how information will be shared from that central software to other participating Stakeholders. The IA should also address operations and maintenance obligations for each participating Stakeholder.</p>

L-DC Region ITS Project	Stakeholders	Agreement Type(s)	Agreement Objectives
Virtual Regional Data Warehouse	<ul style="list-style-type: none"> • KDOT (lead) • City of Lawrence Police • City of Lawrence Municipal Services and Operations • Douglas County Emergency Communications • Douglas County Public Works • Douglas County Sheriff's Office • KTA • KU on Wheels • KU • Lawrence Transit • Local Cities • Local Cities Emergency Services 	<ul style="list-style-type: none"> • Memorandum of Understanding • Interagency Agreement 	<p>MOU: This MOU should develop high-level expectations for what types of data will be exchanged through the virtual warehouse, how they will be used, and the responsibilities of each agency in providing accurate and usable information. The MOU should also describe at a high-level who will be granted access to data, and for what purposes.</p> <p>IA: The IA is needed to formally document how the data warehouse will operate and the formats and protocols used for data exchange. The IA should define the level of access by Stakeholders, as well as how the system will be maintained. The IA can also define any warehouse functionality for data reporting and display. For funding participation, the IA should define development, deployment and operation funding sources.</p>

L-DC Region ITS Project	Stakeholders	Agreement Type(s)	Agreement Objectives
<p>Journey Trip Planner</p>	<ul style="list-style-type: none"> • City of Lawrence Municipal Services and Operations (lead) • KDOT • KTA • KU on Wheels • KU • Lawrence Transit • Local Cities • Private Sector Information Services 	<ul style="list-style-type: none"> • Memorandum of Understanding • Interagency Agreement • Operations Agreement 	<p>MOU: This MOU should develop high-level expectations for disseminating information from the regional stakeholders to the public. It should expand on the understanding that much of the disseminated information may come from the Virtual Regional Data Warehouse.</p> <p>IA: The IA should formally document the types of information the participating public-sector Stakeholders agree to share through a regional traveler information system. The IA should also expand upon the IA for the Virtual Regional Data Warehouse to ensure that traveler information, including incident and emergency information, is provided for dissemination.</p> <p>OA: The OA should be developed between the public and private sectors to define the types of information to be shared with services that will provide commercial traveler information. The OA should define the quality and frequency of public information and the limitations placed on the private sector in processing and disseminating that information.</p>