

**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

	<b>Agency</b>	<b>Stakeholder</b>		<b>Agency</b>	<b>Stakeholder</b>
	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	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
				<b>Public</b>	
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
<b>Development</b>						
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
<b>Total Estimated Near-Term Cost</b>	<b>\$2,014,000 to \$2,618,000</b>
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	\$200,000 to \$1,000,000
<b>Total Estimated Medium-Term Cost</b>	<b>\$2,319,400 to \$4,489,400</b>
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
<b>Total Estimated Long-Term Cost</b>	<b>\$1,376,000 to \$3,136,000</b>
<b>Total Cost of All Projects</b>	<b>\$5,905,400 to \$10,263,400</b>

#### 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 various stops and heavily used as a Transit Center station. The signs display real-time 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, locations to be determined
- For other locations

**Lead Organization:**

- 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

**IT Services Packages:**

- ATMOS - [Transit Information Dissemination to TDMOS - Traffic 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 assumes that existing signage locations throughout the bus stop 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 useful if all key stakeholders in the region.

**Timeline:** Near term (next three years)

**Project Area:** Lawrence-Douglas County Region

**Lead Organization:**

- 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 need

**IT Services Packages:**

- ATMOS - [Transportation Operations Data Sharing](#) (This service package doesn't exist in RAGIT - it is a future project)
- 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 Lawrence and KDOT agreed to for the Transit Station County solution and it is assumed that a similar cost will apply to the IIS Region.

**Performance 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 region

**Lead Organization:**

- City of Lawrence Municipal Services and Operations

**Other Stakeholders:**

- City of Lawrence Police
- City of Lawrence Municipal Services and Operations
- Douglas County Public Works
- KDOT
- KTA
- KU on Wheels
- Lawrence Transit
- 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.)

**IT Services Packages:**

- MCD - [Work Zone Management](#)
- MCD - [Work Zone Safety Monitoring](#)
- MCD - [Work Zone Safety Monitoring](#)

**Estimated Cost:** The estimated cost for work zone management systems (including video cameras, 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


**Rob & Ashley check with EM**

# 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 installed by the Department of Transportation. The signs from the City's Traffic Operation 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.



**Timeline:** Near term (next three years)

**Project Area:**

- Southbound US-69 south of the Turnpike
- Westbound I-69 east of the City
- Eastbound I-69 north of I-40
- Northbound US-69 south of the South Lawrence Freeway

**Lead Organization:**

- City of Lawrence Municipal Services and Operations

**Other Stakeholders:**

- KDOT
- KTA
- KC Scout

**Needs Addressed:**

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

**IT Services Packages:**

- ATMOS - [Transportation Operations Data Sharing](#) (This service package doesn't exist in RAGIT - it is a future project)

**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 techniques 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.

**Timeline:** Medium term (three to six years)

**Project Area:**

- 21st & Iowa (2019) Head south to the South Lawrence Traffic Way
- 19th & I-69 to 19th & I-40
- 19th & Massachusetts Streets to 19th & I-69
- 19th & I-69 to 19th & I-40
- 19th & I-40 to 19th & I-69

**Lead Organization:**

- 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

**IT Services Packages:**

- ATMOS - [Transportation Operations Data Sharing](#) (This service package doesn't exist in RAGIT - it is a future project)

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

- \$144,000 for 21st & Iowa (2019) Head south to the South Lawrence Traffic Way
- \$108,000 for 19th & I-69 to 19th & I-40
- \$115,000 for 19th & Massachusetts Streets to 19th & I-69
- \$115,000 for 19th & I-69 to 19th & I-40

**Total estimated cost is \$482,000.** 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 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 techniques 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.



**Timeline:** Medium term (three to six years)

**Project Area:** Lawrence-Douglas County Region

**Lead Organization:**

- Douglas County Emergency Communications

**Other Stakeholders:**

- City of Lawrence Police
- City of Lawrence Municipal Services and Operations
- Douglas County Public Works
- KDOT
- KTA
- KU on Wheels
- Lawrence Transit
- 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
- Improve incident response to incidents and events

**IT Services Packages:**

- ATMOS - [Transportation Operations Data Sharing](#) (This service package doesn't exist in RAGIT - it is a future project)

**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

**Collaborative Initiatives:**

- ATN10: Transit Fleet Modernization, PT02: Transit Fleet-Route Operations
- ATN06: Transit and Collection Management, PT04: Transit Fare Collection Management
- ATN08: Transit Electronic Farebox, PT01: Transit Passenger Counting
- ATN09: Transit Data Management, PT06: 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 was the Center will be 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 buses 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:** Lawrence Transit Center (location to be determined)

**Needs Addressed:**

- Reduce transit vehicle delay at key intersections

**Collaborative Initiatives:**

- ATN06: Transit Signal Priority, PT08: 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 \$40,000 to \$160,000. 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 of all ages with information about the status of traffic signals. The beacons will be located at the intersection of points of safety concern, such as potential red-light running locations, or at upcoming traffic lights 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 alerts users when the signal they are approaching is red. Or, it may empty when all lanes 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, 4101

**Needs Addressed:**

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

**Collaborative Initiatives:**

- ATN04: Queens, Tulliver, Winton - PT02: Dynamic Roadway Warning

**Estimated Cost:** The estimated cost of this project is approximately \$7,000 to \$10,000 per site for hardware and environmental sensors, and for the floating beacon 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-compliance
- Accidents of Road direction
- Change in travel 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 4101 corridor 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.

The system has the ability to help them find their vehicle by parking going to encourage travel patterns to parking lots with the most availability. The parking management system will collect the best parking management information and systems can also be shared by the planning team.

**Duration:** Medium term (three to six years)

**Geographic Area:** City of Lawrence parking structures and lots

**Lead jurisdiction:** City of Lawrence Municipal Services and Operations

**Other jurisdictions:** 41 on Wheels

**Needs Addressed:**

- Improve parking management and parking information

**Collaborative Initiatives:**

- ATN06: Transit and Collection Management, PT04: Transit Fare Collection Management
- ATN08: Transit Electronic Farebox, PT01: Transit Passenger Counting
- ATN09: Transit Data Management, PT06: Transit Fleet 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 structures and parking spaces in a government-owned or leased 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-Medical vehicles with an emergency signal system with vehicle-to-traffic communication capabilities. Currently, fire and medical vehicles are able to transmit a signal to the traffic signal controller by sending a vehicle light signal to a receiver near the signal. The receiver then sends a message to the signal controller to grant an immediate green light. The current system can be susceptible to radio frequency, and may not function when the line of sight between vehicles and the receiver is blocked.

The upgraded system will use wireless communication that send an emergency signal directly from the vehicle to the signal controller. The wireless communication is more reliable and can provide a more rapid response for the approaching emergency vehicle.

**Duration:** Long term (six to ten years)

**Geographic Area:** Lawrence throughout the City of Lawrence

**Lead jurisdiction:** Lawrence-Douglas County Fire-Medical

**Other jurisdictions:** City of Lawrence Municipal Services and Operations

**Needs Addressed:**

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

**Collaborative Initiatives:**

- ATN06: Transit and Collection Management, PT04: Transit Fare Collection Management
- ATN08: Transit Electronic Farebox, PT01: Transit Passenger Counting
- ATN09: Transit Data Management, PT06: Transit Fleet Management

**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 \$40,000 to \$160,000. 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 at locations with heavy pedestrian and bicycle traffic, such as downtown Lawrence area. The systems will automatically trigger red lights and pedestrian and bicycle warning, such as a flashing beacon or light embedded in the roadway. The systems may also automatically trigger both signs or intersections when pedestrians are present.

Note that this project may be coordinated with the long-term project for video detection, which can include the ability to detect and classify bicycles and pedestrians at intersections.

**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:** Tranning Publics

**Needs Addressed:**

- Improve bicycle/pedestrian warning systems

**Collaborative Initiatives:**

- ATN06: Transit and Collection Management, PT04: Transit Fare Collection Management
- ATN08: Transit Electronic Farebox, PT01: Transit Passenger Counting
- ATN09: Transit Data Management, PT06: Transit Fleet Management

**Estimated Cost:** The estimated cost of a pedestrian/bicycle 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 detection systems, 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**  
1.1.15 Weather Monitoring Project

**3rd party creator, not us**

**3 Road based, 2 non-road based, 1 VIGMW, 1 SourceBP**

**Description:**  
The project will deploy real-time weather sensors in the Region to improve the monitoring and response to weather conditions. The weather sensors will be able to collect area, precipitation, image of the roadway, ambient conditions, and air or noise accumulation.

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 where and how many winter maintenance vehicles to deploy, and what types of materials will be needed to clear the roadway for travel. The information may also be used by the 911 Dispatch center to identify conditions and provide better routing to emergency vehicles.

Location:	Project Areas:
Long-term (six to ten years):	• Lawrence Douglas County Region
Year 1:	• Douglas County Emergency Communications Center
Year 2:	• Douglas County Public Works
Year 3:	• ITR

**Key Deliverables:**  

- Improve weather and road condition information.
- Improve maintenance response to incidents and hazards.
- Improve ability to monitor and provide information about flooding.

**IT/Service Package:**  
 WMSI - Road Weather Data Collection (This service package doesn't exist in RADOT. The full definition is below)  
 The service package covers current and future weather sensors, network-based environmental sensors, and provides the software and hardware needed to connect and manage the sensors. The system architecture will be developed and deployed using cloud-based services. The system will be able to collect and process data from the sensors and provide real-time information to the user. The system will be able to collect and process data from the sensors and provide real-time information to the user. The system will be able to collect and process data from the sensors and provide real-time information to the user. The system will be able to collect and process data from the sensors and provide real-time information to the user.

**Estimated Cost:**  
The estimated cost of the environmental weather sensors including sensors is \$10,000 to \$100,000 per station. The software for collecting and processing real-time weather information is approximately \$10,000. Assuming 50 stations in the Region, the estimated total cost is \$1,000,000 to \$10,000,000. This estimate is based on the federal ITS Knowledge database.

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

- Time to clear roadways.
- Usage of maintenance equipment and materials.
- Incident response time.

**Caleb/Nick**

### 16. Regional Virtual Data Warehouse Project

**1.1.16 Regional Virtual Data Warehouse Project**

**Description:**  
The project will develop a virtual method for agencies to share traffic, maintenance, and incident information. The Virtual Data Warehouse does not create a combined location for data storage. Instead, each agency maintains its own data, but is able to share the data it wishes with other agencies through a regional integration system. Data may include both active and real-time data such as signal timing, incident responses, and other things. Authorized agencies will be able to view the information and images for managing traffic and incidents, and for maintenance planning. Key functions of the virtual data warehouse will be to provide a standardized format for sharing and retrieving regional data in order to make it usable and to ensure that all regional stakeholders are using the same information for their operations. The data will also have the potential for sharing with the general public.

While this project is ongoing, the Region increases its ability to collect information through other ITS products identified in the plan, maintain, and to improve.

Location:	Project Areas:
Long-term (six to ten years):	• Lawrence-Douglas County Region
Year 1:	• City of Lawrence Police
Year 2:	• City of Lawrence Municipal Services and Operations
Year 3:	• Douglas County Emergency Communications
Year 4:	• Douglas County Public Works
Year 5:	• Douglas County Sheriff's Office
Year 6:	• KTA
Year 7:	• KDOT
Year 8:	• Lawrence Transit
Year 9:	• LADOT
Year 10:	• Law Enforcement Services

**Key Deliverables:**  

- Improve information sharing among agencies.
- Improve system operation, including coordination and integration, notification and information distribution.
- Improve maintenance response to incidents and hazards.
- Provide central information dashboard.

**IT/Service Package:**  
 RADOT - Virtual Data Warehouse -> RADOT ITS Data Warehouse

**Estimated Cost:**  
The estimated cost of this project varies widely 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 \$100,000. It is estimated that the total cost of this project is approximately \$1,000,000 to \$10,000,000. This estimate is based on the federal ITS Knowledge database.

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

- Amount of Regional information available to agencies.
- Amount of Regional information available to the public.

**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 allows them to plan their trip using one or more modes, including personal vehicle, transit, bicycle, and pedestrian. The Journey Trip Planner will be interactive and allow the user to enter their origin and destination as well as the planned time of travel and preferred mode(s) of travel. The Trip Planner will provide information such as traffic conditions, real-time parking availability, routing, schedules and costs for various modes. The Trip Planner can encourage travelers to use transit, protect our park-and-ride facilities, and complete trip by foot, bicycle and for errands and errands.

Note that for the Trip Planner to be useful it will require reliable information on all modes of travel and parking from the Region's Stakeholders. Much of the needed information will be collected through other projects in this Plan. Also note that significant efforts have been made to the private sector to develop Journey Planners that use publicly available data. The ITC Region may benefit from leveraging private sector applications that use data provided by the Region's Stakeholders through a Virtual Data Warehouse.

Location:	Project Areas:
Long-term (six to ten years):	• Lawrence-Douglas County Region
Year 1:	• Douglas County Public Works
Year 2:	• KDOT
Year 3:	• KDOT
Year 4:	• KDOT
Year 5:	• Lawrence Transit
Year 6:	• Lawrence Transit
Year 7:	• Lawrence Transit
Year 8:	• Lawrence Transit
Year 9:	• Lawrence Transit
Year 10:	• Lawrence Transit

**Key Deliverables:**  

- Improve multi-modal traveler information.
- Improve information on transit information sharing with a wide area.
- Improve transit information.
- Improve multi-modal information.
- Expand transfer information delivery methods.

**IT/Service Package:**  
 RADOT - Journey Trip Planner -> RADOT ITS Data Warehouse

**Estimated Cost:**  
The estimated cost of similar projects in the United States has ranged from approximately \$100,000 to \$1,000,000 for hardware, software and equipment. Additional hardware, such as GPS or mobile can significantly increase the overall project cost. For the ITC Region, it is assumed that \$100,000 in previous projects will be used, and the total estimated cost is \$1,000,000 to \$10,000,000. This estimate is based on the federal ITS Knowledge database.

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

- Use of modes other than personal vehicles.
- Average travel time in the Region.

**Ashley**

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

### 18. Traffic Detection Improvements Project

**Program**  
1.1.18 Traffic Detection Improvements Project

**3rd party creator, not us**

**3 Road based, 2 non-road based, 1 VIGMW, 1 SourceBP**

**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.

Location:	Project Areas:
Long-term (six to ten years):	• City of Lawrence

**Key Deliverables:**  

- Improve traffic flow at intersections through improved signal timing and control.
- Improve bicycle/pedestrian warning systems.

**IT/Service Package:**  
 AEMIO - Video Detection (This service package doesn't exist in RADOT. The full definition is below)  
 This service package includes traffic detectors, other surveillance equipment, the necessary hardware, and the software that manages the equipment. The system architecture will be developed and deployed using cloud-based services. The system will be able to collect and process data from the sensors and provide real-time information to the user. The system will be able to collect and process data from the sensors and provide real-time information to the user. The system will be able to collect and process data from the sensors and provide real-time information to the user. The system will be able to collect and process data from the sensors and provide real-time information to the user.

**Estimated Cost:**  
The estimated cost of video detection at intersections is approximately \$120,000 to \$140,000 per intersection. The hardware and software to process traffic information from image and data is roughly equal to \$120,000 to \$140,000. Assuming twenty-two intersections will be equipped, the total cost of this project is estimated to be \$2,700,000 to \$19,600,000. 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 at intersections.
- Reduced bicycle/pedestrian crashes.

**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 ITC 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**

**Key Deliverables:**  

- Improve multi-modal traveler information.
- Improve information on transit information sharing with a wide area.
- Improve transit information.
- Improve multi-modal information.
- Expand transfer information delivery methods.

**Estimated Cost:**  
The estimated cost of this project varies widely 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 \$100,000. It is estimated that the total cost of this project is approximately \$1,000,000 to \$10,000,000. This estimate is based on the federal ITS Knowledge database.

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

- Amount of Regional information available to agencies.
- Amount of Regional information available to the public.

**MPO Person to Update: Ashley**

### Any New Projects to Include?

**Future Shared Mobility (scooters, etc)**

**Electric vehicle infrastructure**

**Vehicle-to-Pedestrian Communications:** [https://www.itd.gov/actheets/cv\\_v2pcomm.htm](https://www.itd.gov/actheets/cv_v2pcomm.htm)

**\$2 mill per year to do innovative technology solutions**

**\$3rd party creator, not us**

**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