Draft Projects Included in the Plan Available for Public Comment May 5 – May 21, 2021

Project	Description
01 – Signal Coordination Program	This project will expand and improve the use of traffic signal coordination along major corridors throughout the City of Lawrence. This program will enable signal coordination control of signals at these intersections through control at the Traffic Operations Center. Signal coordination is a continuing process. Staff will monitor existing coordination and prioritize future changes as traffic patterns change, communication infrastructure is expanded, and signal equipment improved. The effectiveness of existing plans and implementing a new coordination plan will be evaluated through the Signal Performance Measures Data and traffic count data. Plans will be updated after significant equipment upgrades or adding new signals to a corridor.
02 – Traffic Detection Improvements Program	The Traffic Detection Improvements Program will continue to upgrade existing camera based detection devices with radar detection equipment. Upgrading detection technology will improvement signal reliability and coordination plan performance. The City has upgraded to radar–based detection at 36 of the 102 City owned or maintained traffic signals to improve system reliability and provide better data to for system performance measurement. Future improvements may include advanced detection and other improvements to better classify vehicles and pedestrians and provide better response. An ultimate detection system may only detect the presence of vehicles, but also be to identify and track when they arrive at the intersection (red/yellow/green), and provide accurate traffic counts. The detection equipment may also be able to identify and classify pedestrians and bicycles at intersections. Once bicyclists 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 Improvement Project can be coordinated with the Bicycle/Pedestrian Warning Systems Project to detect bicycles and pedestrians.
03 – Traffic Signal Performance Measures Program	The Traffic Signal Performance Measures Program will allow the Traffic Operations Center to identify signal failures or significant traffic pattern changes in real time and quickly respond. Through expanding the fiber optic communications infrastructure, more modern controllers are now able to send high–resolution data where data trends can be established for different intervals. The TOC will monitor system trends to inform repairs and allocate resources for timing or coordination updates. The system will allow staff to track system performance over time and send real time alarms for detection failures or other data anomalies. The system can measure turning movement counts, red–light violations, split failure, phase terminations, arrivals on green/yellow/red and pedestrian delay. The initial phase of the program will maximize the use of the existing infrastructure and focus on alarming for detection failures. The next step for developing this program will require detection improvements to track at what point in the cycle vehicles are arriving at the intersection. This information can be used to identify areas that require an updated timing/coordination plan due to long term traffic pattern changes or where a special event plan would be most beneficial. Future phases may include integrating the data in the Work Zone Management, Dynamic Message Signs and Event Management Programs.
04 – Fiber Communications Expansion Program	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, but also use alternative data communications where fiber is not feasible or cost–effective. Alternate technologies may include cellular and microwave. The purpose 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 52 of 104 signals and a majority of its traffic cameras. This project would expand 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 will also benefit from using the communications network.

Project	Description
05 – Camera Deployment Program	This project expands upon the Traffic Signal Coordination Program by adding new and updating existing cameras to the City's available inventory of traffic images. Currently the City has PTZ cameras at 52 out of 102 City owned or maintained traffic signals and 360–degree cameras at 6 six locations in Downtown Lawrence. Between 6 and 10 cameras are planned to be added to the system in 2021 as part of the South Iowa Traffic Signal Improvement Project. This expansion may include multiple City–owned cameras along K–10 at Iowa Street and 27th Street. Traffic and engineering staff will work with local law enforcement agencies to specific the most effective equipment to install at each site. The project will implement improved image–sharing technology at the City of Lawrence Traffic Operations Center to improve real–time sharing of images with other agencies in the Region. This will allow the Traffic Operations Center to view images from KTA's two cameras on the Turnpike in Douglas County, and be able to share real–time images to the Region's emergency responders and traffic management agencies via the Internet. The City of Lawrence will be able to share camera images but will not share control of City cameras. Only the Traffic Operations Center will be able to control their pan–tilt–zoom functions.
06 – Emergency Signal Preemption Improvements Program	In 2017–2018 Lawrence–Douglas County Fire Medical vehicles and intersections were upgraded to from the old strobe–based system to vehicle–to–signal controller wireless communication. The new system uses wireless communications that sends an encrypted 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. This project needs to be continuously implemented as new Fire–Medical vehicles are purchased and signalized intersections are constructed. The Lawrence Police Department is interested in remote control of intersections during events and incidents (project 17).
07 – Weather Monitoring Program	This program will deploy road–weather sensors in the Region to improve the monitoring and response to weather conditions. Ultimately, the weather sensors will be able to collect wind, precipitation, images of the roadway, pavement conditions and ice or snow accumulation. Information collected from the sensors throughout the Region will be shared to provide maintenance crews the ability to observe conditions at remote locations and be able to plan and respond to severe weather. The information can be used to determine when and how many winter maintenance vehicles to deploy, and what types of materials will be needed to clear 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.
08 – Alternative Fuels or Low-No Emissions Infrastructure and Vehicles Program	This project will install electric vehicle charging stations and associated infrastructure. Currently two stations are located at Rock Chalk Park. Lawrence–Douglas County Sustainability is working to implement Lawrence City Commission Ordinance 9744 (https://cdn.lawrenceks.org/wp–content/uploads/2020/06/Ord9744–signed.pdf), which establishes a goal of 100% clean, renewable energy for all energy sections including transportation by 2035. A downtown charging station is being planned for 711 New Hampshire St. KU Transportation Services is adding electric vehicle stations to potentially all three of their parking garages. Lawrence Transit received a federal grant for 5 electric buses and charging infrastructure. These will be delivered in 2022. As part of Lawrence Transit's fleet replacement plan, they plan to apply for additional electric buses yearly through federal grant programs. If an average of 1–2 vehicles are purchased every year the fleet will be completely converted to electric buses by 2035.

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	The Lawrence–Douglas County Sustainability Office will be launching a Climate Action Plan in the spring of 2021. This plan will begin the planning for transitioning to zero emissions/renewable transportation. Thus this program will become more fully fleshed out as more planning occurs. To further reach sustainability goals, all city fleet vehicles will be transited to electric or some other non–fossil fuel energy source. This includes trash trucks, snowplows, etc. This program is split into various components: • 8a Lawrence Public Charging Stations • 8b Private Charging Stations • 8c Transit Charging Stations • 8d Transit Vehicles • 8e Lawrence City Vehicles (Including Fleet & Operations) – 782 • 8f Lawrence City Charging Infrastructure • 8g Other Cities Vehicles and Charging Infrastructure • 8h County Vehicles and Charging Infrastructure – 371
09 – Work Zone Management Program	The Work Zone Management Program will continue to improve an integrated implementation of technologies to improve the safety and efficiency of work zones. The City of Lawrence can recently made improvements with portable message signs requirements, construction zone mapping and public outreach. Future improvements may include using cameras to monitor traffic and operations in work zones, radio broadcasts to inform travelers of maintenance and construction activities and potential delays, portable barriers that can be controlled by maintenance crews, and locally controlled signals 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.
10 – Bicycle/Pedestrian Warning Systems	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 bicyclists and pedestrians. The systems may be deployed in locations with heavy pedestrian and bicycle traffic, such as the downtown Lawrence area and at shared use path crossings. The systems can be manually actuated or automatically detect bicyclists and pedestrians and provide a warning, such as a flashing beacon or lights embedded in the roadway. The systems may also automatically trigger walk signals at intersections when pedestrians are present. The operational status of the system and the state of the pedestrian crossings could be communicated to the Traffic Operations Center. 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.
11 – Shared Mobility Program	Shared mobility refers to various vehicles that people use for transportation without owning it. This includes automobiles, bike, scooters, and others. Shared mobility can be implemented in various ways: 1. A traveler arranges for the temporary use of a vehicle. 2. A traveler arranges for a vehicle to pick them up at a specific location and take them to another location (either ride matching or ridesharing including services provided by Uber and Lyft). 3. Bikeshare or scooter rental. Most likely this would be accomplished through a third–party system.
12 – Dynamic Message Signs	This project has two components: 1) KDOT installing "end of queue warning" Dynamic Message Signs along the 2–lane portion of K–10 and 2) other potential Dynamic Message Signs at strategic locations in the Region to aid in providing traffic information to the public and managing congestion and event traffic. KDOT is constructing a system for "end of queue warning" along the 2–lane portion of K–10. These boards will work in conjunction with 6 radar sensors measuring vehicle speeds along various spots along K–10. When there are slowdowns or vehicle queues at the Wakarusa traffic signal or elsewhere along this 2–lane corridor, real–time messaging will be displayed on the nearest upstream board alerting drivers of the congested conditions ahead. There will be 2 DMS boards and 3 traffic sensors for each travel direction of K–10. In the event of a complete closure along this highway corridor, the most upstream boards will advise drivers to

Project	Description
	divert onto City of Lawrence surface streets, namely Iowa and Clinton Parkway. This system will be operational starting in the Summer of 2021. The other potential DMS signs will provide event, detour, parking, and other information to travelers as they enter the City of Lawrence. Locations will be selected prior to critical travel decision points to encourage travelers to take alternate routes when there is congestion on main roads. A camera would also be installed at each DMS location. The cameras will be used to monitor the status of the DMS.
13 – Signal Beacon Deployment	The Signal Beacons Project provides a low–technology way to provide travelers of alerts of roadway conditions. The beacons will be located along the roadway ahead of points of safety concern, such as potential roadway flooding locations, or an upcoming traffic signal that a driver should be made aware of. The beacons will be connected to other field devices. For example, a flood warning beacon will be connected to a weather sensor that detects water level 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 alert drivers when the signal they are approaching is red. Or it may simply warn at all times of the presence of the signalized intersection ahead.
14 – Transit Traveler Information Improvements	This project will provide real–time transit vehicle arrival times to transit passengers at bus stops and transfer centers. Lawrence Transit and KU on Wheels are already able to provide this information via an app to passengers' phones, and this project will increase information distribution through the use of electronic signs and the web. The electronic signs will be deployed at the Multimodal Transfer Facility at Bob Billings & Crestline, Downtown area transfer improvements, and in the future at key stops that are heavily used or are frequent transfer locations. The signs display "next bus" arrival times.
15 – Transit Management Improvements	Transit Management Improvements will be a series of technology upgrades to both Lawrence Transit and KU on Wheels vehicles. The improvements include systems that allow transit to better manage and plan its services though better data collection and analysis tools as well as improve the customer experience. GTFS real–time development will allow Lawrence Transit and KU on Wheels to provide real–time bus information to third–party trip planning apps, which will improve the passenger experience. A mobile fare payment system with Bluetooth validators will reduce the use of cash on transit and more efficiently collect fares, leading to shorter dwell times at stops. Additional automated vehicle location hardware on paratransit vehicles would allow for the development of a microtransit platform to allow comingling of trips between T–Lift, Jay–Lift, and general public microtransit service. Automated annunciators will provide audio stop announcements on fixed route buses for every stop, fulfilling federal ADA requirements and improving the consistency of the passenger experience. On–board digital rider alert panels will allow staff to update information remotely to all vehicles to provide information to passengers to notify them of reroutes, survey opportunities, or other safety or public service announcement information. Rear destination signs will allow passengers to more easily locate their bus at transfer locations.
16 – Transit Signal Priority	The Transit Signal Priority will equip Lawrence Transit fixed–route 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 it is feasible to shift the signal cycle at the intersection in order to expedite the bus's movement through the intersection. Transit Signal Priority will only be deployed at to–be–determined locations where buses frequently experience delay. The purpose of signal priority will be to help prevent buses from being delayed and to 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 number of riders on the bus, or the headway between buses on the same route.

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	Note that this project will require a review of State and City law regarding the use of devices to provide green lights to vehicles.
17 – Parking Management Systems	This project will improve the management of parking in the City of Lawrence and on the KU campus through the use of advanced technologies to track usage and space availability. Vehicle count systems will monitor the usage of parking at City and KU lots. This information will be shared with the public to help them travel directly to where parking is located. The system may also be able to dynamically control parking pricing to encourage travel patterns to parking lots with the most availability. The parking management system will collect data to help parking management agencies develop parking plans. Information generated by the Parking Management Systems can also be shared by trip planning tools and through Regional traveler information systems. KU Transportation Services will most likely move to the same smart phone paying app the City of Lawrence recently deployed. KU Transportation Services is moving to a different system for when people do not pay their parking tickets. The City of Lawrence Parking is implementing the 10 Year Operational & Development Plan submitted by Desman Design Management in June 2017 – https://lawrenceks.org/pds/parking.
18 – Event and Incident Management Improvements	The Incident and Event Management Improvements Project will expand upon several near–term projects: the deployment of DMS, the increased collection and sharing of traffic images, the improved information sharing among agencies, and remote control of intersections during events and incidents. It will also utilize the expanded communications network to link management centers. This project will improve the real–time communication and coordination among emergency responders and traffic management to coordinate event traffic management plans, respond to incidents in real–time, and provide travelers with congestion, parking and alternative transportation mode information. The project will define means for all agencies in the Region to exchange information as needed. KC Scout currently performs regional event and incident management in the Kansas City region and provides a solid template for the L–DC Region to emulate. In addition, software used by KC Scout may be suitable for the L–DC Region and provide interoperability among the regions.
19 – Regional Virtual Data Warehouse	This project will develop a virtual method for agencies to share traffic, maintenance, transit, emergency 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 chooses with other agencies though a Regional integration system. Data may include both archives and real–time data such as signal timing, incident responses and video images. Authorized agencies will be able to use the information and images for managing traffic and incidents, and for maintenance planning. Key functions of the virtual 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 important, its value is limited until the Region increases its ability to collect information through other ITS Projects identified in the near–, medium– and long–term. As the project is built out it will be split into a Statewide Data Warehouse maintained by KDOT and a Lawrence–Douglas County version maintained by City of Lawrence Municipal Services and Operations department.

Project	Description
20 – Journey Trip Planning Tool Project	The Journey Trip Planner will be an online tool available to travelers through their computers and personal devices that allows them to plan trips 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, carpool, use park–and–ride facilities and complete trips by foot, bicycle and bus for events and commutes. 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 including the Virtual Data Warehouse. Many third–party services provide this service. For it to be fully functional the various stakeholders would need to make their information available to the platform.
21 – Connected Vehicles Project	The transition to "connected vehicles" may significantly impact the way vehicles and the transportation network interact. Connected vehicles could mean utilizing vehicle information to adjust signal timing for an intersection or group of intersections in order to improve traffic flow, including allowing platoon flow through the intersection. It also could mean providing customized real–time driving advice to drivers so that they can adjust their driving behavior to save fuel and reduce emissions. 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 all system users. Currently, the connected vehicle environment includes three major approaches to communication : 1. Vehicle to vehicle (V2V) 2. Vehicle to infrastructure (V2I) 3. Vehicle to pedestrian (V2P). While there is no talk in the region about implementing the infrastructure for connected vehicles, planning needs to occur to be ready when it is rolled out nationwide.

The hyperlink associated with each project/program links to the project page within the RAD-IT website. The project pages have more detailed information including a status, timeframe, stakeholder, inventory, services, and interfaces.