Johnson and Wyandotte Counties

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Optimization Plan
Moving Forward Appendix

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MARC
Mid-America Regional Council

Kansas

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The I-35 Corridor Optimization Plan is intended to serve as a living document that can be reviewed and reevaluated at regular intervals by the Kansas Department of Transportation (KDOT), Mid-America Regional Council (MARC) and their planning partners in order to monitor and respond to the evolving operations, conditions and trends of the corridor. The optimization plan is comprised of a detailed description of the preferred strategy and five individual plans focused on key future planning elements.

Implementation of the preferred strategy is planned to occur in phases over the next 30 years, as corridor conditions warrant. These individual plans will guide KDOT, MARC and their planning partners moving forward beyond this study. The *I-35 Moving Forward Plan* is made up of five individual plans, as well as immediate next steps.

- Corridor Technical Plans
- Funding and Financing Plan
- Policy and Governance Plan
- Public Engagement Plan
- Corridor Monitoring Plan
- Next Steps

Corridor Technical Plans

The technical plans identify the primary components of the preferred strategy – ITS, multi-modal, shoulder running, managed lanes and fix key bottlenecks. Within each of these primary components a description of the improvement, next steps and key considerations are identified.

ITS Plan

The I-35 Corridor has the typical KC Scout intelligent transportation system (ITS) deployment of traffic surveillance cameras, dynamic message signs (DMSs) and vehicle detection running the entire length of the corridor. Additionally, there is existing motorist assist service provided by the Kansas Highway Patrol. In the short-

Recommended Improvement Time Frame vs. Planning Next Steps Time Frame.

Recommended improvement time frames represent the estimated time implementation of the capital project. These time frames are broken out into:

- Short-term (2013 – 2020),
- Mid-term (2020 – 2040) and
- Long-term (beyond 2040).

(Time frames could change based on the performance monitoring plan.)

Planning next steps time frames represent general time frames to begin planning next steps to move the recommended improvements toward implementation. These planning next steps are generally broken out into:

- Immediate quick start (0-1 Years),
- Mid-term (2-5 Years) and
- Long-term (>5 Years).

term (2013 to 2020), ITS recommended improvements include ramp metering, advanced traveler information facilitation and promotion, enhanced incident management strategies and arterial DMSs. In the mid-term (2020 to 2040) the recommendations include implementing active traffic management strategies and crash investigation sites. In the long-term, it recommended that the ITS infrastructure be enhanced to support electronic toll collection, and new ITS and active traffic management technologies.

Ramp Meters

Ramp meters are identified as future improvements on all on-ramps from 175th Street to Cambridge circle. A ramp meter is a traffic signal on a ramp that controls the release of vehicles onto the freeway. The ramp meters break up merging traffic queues improving safety and reducing the impact on mainline traffic flow. To implement ramp meters, many on-ramp acceleration lanes may need to be lengthened and ramps may need to be widened to provide vehicle storage.

Planning Next Steps

The implementation of ramp meters will require study of the interaction of each ramp's geometrics, traffic volumes and ramp meter operation. Once the ramp meter configuration and needed geometric improvements are determined, the ramp meters at each on-ramp must be designed and constructed. Even with the existing ramp meters in the I-435 corridor in operation, additional public outreach is needed to prepare drivers to use the ramp meters. The public outreach campaign from the I-435 corridor ramp meter deployment has good applicability to the I-35 Corridor and can be updated and reused.

Key Considerations

- What geometric improvements are needed for each on-ramp?
- How should prioritization of on-ramps at service interchanges occur?
- Where should transit bypass lanes be provided to allow transit queue jumps?

Promote and Facilitate Advanced Traveler Information

Advanced traveler information provides drivers timely and accurate information so they can make educated travel decisions. Advanced traveler information is available from multiple public and private sources. The primary public sources for traveler information on the I-35 corridor are KC Scout's website, the *My KC Scout* service and KDOT's 511 automated phone service. *My KC Scout* provides traffic alerts by email, mobile phone text messages, pagers and a computer taskbar application. An advantage to that service is the ability to designate routes and time frames the alerts are desired. KDOT's 511 service can be accessed from any phone in Kansas by dialing "511." Through a voice activated system, corridor, location and direction of travel traveler information can be obtained. Examples of private traveler information providers are local television stations, private venders such as NAVTEC, TrafficLand and INRIX.

To maximize the benefits of advanced traveler information drivers must be aware the information is available and useful. The KC Scout website, *My KC Scout* and KDOT 511 can be promoted to increase the public awareness of the services' availability and usefulness. Private providers must have accurate information available in real-time. KC Scout has the needed information for the I-35 corridor and shares it with private providers. KC Scout must also be flexible to allow the sharing of information with new private entities wanting to distribute traveler information.

Promotion of the KC Scout website, *My KC Scout* and KDOT 511 can increase public awareness of the services' availability and usefulness.

Planning Next Steps

The associated public awareness campaign should be consistent with the traveler information strategic plan that KDOT has recently completed. The objective will be increased usage of the KC Scout website, *My KC Scout* and KDOT 511. Sharing of traffic and incident information with private traveler information should continue and be enhanced as new federal requirements are met for information development and sharing.

Key Considerations

- Accuracy and timeliness of the information;
- Amount of network covered; and
- Promotion of safely accessing available information.

Enhanced Traffic Incident Management

Non-recurring congestion caused by traffic incidents represents a significant portion of the congestion along the I-35 Corridor and reduces travel time reliability. Efficiently managing traffic incidents can more quickly remove the traffic flow restriction. While KC Scout currently facilitates traffic incident management coordination, and the KHP/KDOT motorist assist provides services in the corridor, these existing strategies can be enhanced and additional traffic incident management strategies can be implemented.

Enhanced motorist assist can be improved with additional funding, which will provide needed benefits to safety and non-recurring congestion impacts to motorists. Enhance motorist assist improvements could add additional operators and vehicles to each shift to reduce response time to traffic incidents and provide more resources available to address major incidents. This could also include multidiscipline responder training to expand existing to responders from all agencies involved in traffic incident management to enhance communications, coordination and cooperation among responders.

Planning Next Steps

As part of the on-going traffic incident management coordination efforts, a focused assessment of needs in the I-35 Corridor should be conducted with a variety of stakeholders. Once needs are agreed upon, candidate traffic incident management strategies can be selected to help address needs. The strategies can be prioritized and evaluated by the diverse stakeholder groups. (For example, commuters, commercial drivers, law enforcement, emergency services, etc.) Funding must be identified to implement the preferred strategies. Since expansion of the motorist assist program builds on an existing successful strategy, it can be implemented efficiently if additional funding is available.

Key Considerations

- Input from traffic incident responders; and
- Coordination with other traffic incident management activities region wide.

Arterial Dynamic Message Signs

Arterial Dynamic Message Signs (DMSs) are proposed on the arterial roadways that provide connections to I-35. Using these signs, messages about congestion or incidents can be provided to drivers before they enter the freeway, which will allow them to take an alternative route. Messages can include I-35 traffic incident warnings and travel times on I-35. This will allow for more efficient use of the existing arterial roadway system by en-route drivers when congestion occurs on I-35. Information can be customized for unique audiences, such as truck drivers on arterials serving large traffic generators such as the BNSF intermodal terminal.

Planning Next Steps

The existing KC Scout system is coordinating with the city of Overland Park on placing freeway information on the city's arterial DMSs. Dynamic Message Signs already exist along the 135th Street Corridor near U.S. 69 in Overland Park. A concept of operations should be developed detailing how the new ITS devices will be operated. Locations for the DMSs will need to balance the ability to take alternative routes with the percentage of traffic flow being exposed to the DMS message. A phased deployment plan will need to be developed that includes expected funding needs. Design packages can be developed for the phased deployment and the signs can be deployed.

Key Considerations

- Local jurisdiction acceptance of the concept of diverting traffic from I-35 to their roadways;
- Location of new arterial DMSs on other agency's right of way; and
- Local partnerships.

Active Traffic Management with Lane Control Signs

The proposed active traffic management strategy will enable real-time control of lane usage, facilitate variable speed warnings and provide lane specific warnings. With lane control, a shoulder could be used as a lane in the peak hours or during traffic incident management. The shoulder use lane control can be varied based on the time of day. Lane-specific warnings allow drivers to be warned of blocked lanes and the need to move over to adjacent lanes.

The proposed active traffic management strategy will enable real-time control of lane usage, facilitate variable speed warnings and provide lane specific warnings.

Approximately every half-mile along the corridor a sign gantry is proposed with small dynamic message signs mounted over each lane. The dynamic message signs are used to communicate lane-specific information to drivers. In the case of a traffic incident blocking a lane, the signs would be used to slow down traffic with reduced lane speeds and influence drivers to move out of the blocked lane. This helps eliminate the very dangerous speed differential that occurs at the end of a freeway queue. The half-mile spacing of the lane control signs allows a dynamic queue warning system to be implemented that can adjust as the queue grows and shrinks.

Planning Next Steps

Since active traffic management is relatively new in the United States, the few existing deployments should be assessed for lessons learned. Prior to deployment, a concept of operations will need to be developed to refine and document the operations of the proposed system. Deployment of active traffic management will need to be implemented continuously along sections of the I-35 Corridor to be effective.

Key Considerations

- Implementation of the lane control signals is recommended to implement part-time shoulder running or active lane restrictions; and
- Operational protocols must be developed to ensure consistent operation of the lane control and variable speed system.

Crash Investigation Sites

Crash investigation sites provide refuge at intermittent points when the shoulder is not available. Crash investigation sites move vehicles off the freeway mainline and shoulders, when they are being used, to locations where motorists are not exposed to freeway traffic. Drivers involved in a minor crash but able to drive can relocate to the site to exchange information. Law enforcement can direct drivers to the sites for crash investigation and issuance of traffic citations in a safer environment. They can

also provide a site where vehicles can be towed to clear lanes. One example of a traffic incident management strategy beginning to be used in the Kansas City region is the use of LIDAR (Light Detection and Ranging) an optical remote sensing technology to allow for more efficient crash investigations. Needed crash data can be collected in a shorter amount of time, so the incident scene can be cleared sooner and traffic flow can be returned to normal.

Crash Investigation Sites help speed up the (1) collection of data, (2) clearing of the incident and (3) return of normal traffic flow.

Planning Next Steps

Available locations for crash investigation sites must be assessed along the corridor. Available right-of-way will could allow for sites. Existing private parking areas near interchanges can also be used, but owner permission must be received and drivers must be directed to the sites by signing. Once available locations are determined, the site must be designed. Important considerations include access, capacity, signing, marking and security. Construction of crash investigation sites can be done as a stand-alone project or more cost effectively as part of a major roadway improvement project. A public awareness campaign is necessary along with signing to influence the use of the sites.

Key Considerations

- Law enforcement commitment to use sites;
- Public education of the site's existence and when they should be used; and
- Available right-of-way.

Support Electronic Toll Collection

Electronic toll collection requires participating vehicles to be uniquely identified and classified, and creation of a toll account. Another important aspect of electronic toll collection is an enforcement system. That enforcement system must that identify non-participating vehicles, so they also pay appropriate tolls on the facility. And in where systems have a high occupancy toll (HOT) lane that allows special user groups to operate without being charged a toll, the enforcement system must also be able to discriminate between vehicles that meet the non-toll criteria (e.g., two-person car pool or transit vehicle). Technologies to provide this needed functionality currently exist, but continue to evolve, so specific technologies are not recommended at this time.

Planning Next Steps

Given improving toll collection technologies and the growing use of tolls, the state of toll practices should be assessed if and when the decision to implement electronic tolling is made.

Key Considerations

- Stakeholder feedback on tolling a lane of I-35;
- Conduct a toll feasibility study for I-35;

- Selection of state of the practice technologies to implement tolling at the time tolling is implemented; and
- Legislative support (discussed in more detail in the section, *Policy, Governance and Legislative Plan*).

Other Future ITS/ATM Technology Improvements

The U.S. DOT's Connected Vehicles initiative is focused on providing safer and more efficient transportation on the nation's roadway system through technology. These technology improvements will allow vehicles to communicate with each other and with the transportation infrastructure. These technologies are currently in the research and demonstration project stage. KDOT and its planning partners should continue to monitor advancements in this initiative for possible application to I-35 – both for passenger vehicles and freight transportation.

KDOT and its planning partners should continue to monitor advancements in ITS/ATM technology for possible application to I-35 – both for passenger vehicles and freight transportation.

Planning Next Steps

Monitor Connected Vehicles technology and systems to assess when they are ready for deployment.

Key Considerations

- Connected vehicle technology implementation is dependent on auto manufacturer adoption and vehicle fleet turnover
- Monitor the perceptions of corridor users to this technology

Fiber Optic Backbone Extension

The existing KC Scout system has a fiber optic backbone along I-35 that extends from downtown Kansas City, Missouri to just north of 127th Street. South of this point wireless technologies are used to communicate with the existing ITS devices. When electronic tolling and future ITS technologies are deployed, the fiber optic backbone should be extended to provide a robust communications network. A robust communications network is particularly important for all electronic tolling because a loss of communications means lost revenue.

Planning Next Steps

As tolling and new ITS technologies are proposed south of 127th Street, assess the need for an enhanced communications network based on a fiber optic backbone. When the backbone is extended, the existing ITS devices should be connected to provide a more reliable communications link.

Key Considerations

- Electronic toll collection systems require very robust communications systems; and
- Until new ITS devices are deployed, the upgrade to a fiber optic based communications network is not needed.

Multi-Modal Plan

Transit Plan

The I-35 Xpress transit capital and service enhancements successfully implemented by Johnson County Transit (JCT) in 2012 represent significant improvements in transit service for the I-35 Corridor. They also serve as a sound basis for additional enhancements. Building on the success of these improvements is the transit focus for I-35 moving forward. The following key transit improvements are included within the I-35 preferred strategy.

The focus of *I-35 Moving Forward's* transit plan is building on the success of the I-35 Xpress (Bus on Shoulder).

Expansion of Bus-on-Shoulder operations.

In the short-to-mid-term, improvements to existing and proposed Bus-on-Shoulder (BoS) segments should be identified and implemented. Improvements include eliminating shoulder obstructions and constraints that preclude BoS operation. The following segments of I-35 and other, connecting freeways were identified for potential expansion of BoS:

- North into Wyandotte County to State Line;
- South of the current limit at 95th Street to at least 135th Street;
- U.S. 69 from I-35 to 151st Street; and
- I-435 and K-10 west of I-35 to K-7.

When shoulders are being used in the mid-term by other, restricted vehicles (HOVs/HOTs), buses will be integrated with these vehicles to continue to help provide them with reliable travel times. As managed lanes are established on I-35 in the long-term, buses can use the managed lanes and will not need to operate on shoulders to achieve priority over other traffic.

Implement transit priority measures at interchanges to reduce transit travel times and improve service reliability and timeliness.

There are several priority measures that are recommended at interchange areas to enhance transit operations.

- Queue jump lanes at metered ramps to give buses priority on congested freeway ramps. Queue jump lanes add transit lane and programming the signal to provide a short green advance for buses.
- Transit Signal Priority (TSP) on arterial roadways at interchanges on congested approaches.
- Fast off – fast on bus access to park and ride lots in close proximity to the interchange ramps allowing buses to exit and reenter the freeway in a short period of time to serve passengers. In cases of high bus volumes and high passenger demand, new transit-only freeway access ramps may be warranted.

- Transit service enhancements - Transit service enhancements include additional Xpress trips to increase the frequency of service and the span of the service. Xpress service could add midday trips, evening trips and even weekend service. These enhancements can also include additional passenger amenities, such as the provision of real-time transit information, public Wi-Fi on buses and more comfortable buses. Future Xpress service enhancements include:
    - Service additions to current Xpress routes to include additional peak period trips, midday service, early evening service and weekend service.
    - Establishment of Xpress service on Route 678S – Shawnee – Downtown Xpress.
    - Establishment of a new Xpress route serving Olathe west of I-35.
    - Establishment of a new route serving Olathe and Lenexa along the K-10 corridor.
    - Establishment of a new route serving Leawood along 119th Street or 135th Street.

Passenger facility improvements

As Xpress routes and stations are added, improvements to create more visible transit stations with more passenger amenities should be extended to the new stops using the same theme to reinforce the Xpress brand. These improvements, which include a distinctive shelter, electronic real time bus arrival sign and Xpress service branding features, enhance passenger convenience and elevate the profile of transit.

Additional park and ride lots are critical to the success of expanded I-35 services. JCT, with assistance from KDOT, should pursue dedicated park and ride lots at key locations such as:

- Vicinity of K-10 and Renner Road;
- Shawnee Mission Parkway and I-35; and
- I-35 & 95th Street.

Planning Next Steps

Johnson County Transit has the primary responsibility for transit service in Johnson County however, KDOT is responsible for the I-35 infrastructure. Johnson County Transit and KDOT have successfully partnered in the past, and a partnership is required to realize the improvements included in the recommendations for the I-35 Corridor. Funding is a critical determinant of the timing of these next steps.

<u>Immediate Quick Start (0-1 Year) Next Steps</u>

- Update JCT Strategic Plan to incorporate Corridor Optimization strategies;
- Complete planning and engineering for BoS extension south on I-35 and U.S. 69;

- Begin detailed planning and financing for new Xpress routes; and
- Implement BoS on I-35 in Wyandotte County.

Mid Term (2-5 years) Next Steps

- Begin planning and engineering for new park & ride lots;
- Complete planning and engineering for BoS extension west along I-435/K-10; and
- Continue detailed planning and financing for new Xpress routes.

Long Term (beyond 5 Years) Next Steps

- Plan and design transit priority at interchanges;
- Coordinate active traffic management with transit improvements; and
- Prepare transition plan for Xpress routes to managed lanes.

Key Considerations

These key considerations are the basis for the transit-related recommendations.

- Provide priority to transit vehicles where possible to make service more attractive. Transit priority measures can include Bus-on-Shoulder operations, queue jumps, transit signal priority and managed traffic lanes.
- Transit service in Johnson County is operated and funded by JCT. While the Johnson County Board of County Commissioners controls policy, JCT and KDOT have been successful partners. This relationship should continue.
- Johnson County Transit maintains a strategic plan that is used to guide service improvements such as the ones contemplated in the Corridor Optimization study. As the Strategic Plan is updated recommendations from the Corridor Optimization study should be incorporated.
- Funding for transit-related infrastructure improvements is available from the Federal Transit Administration (FTA) as well as sources KDOT more typically uses.
- Transit funding in Johnson County has historically included county general revenue (approved by the Board of County Commissioners), state revenue administered by KDOT (this has been declining) and federal funding – mostly for capital items. These past discussions have covered ides ranging from a dedicated local (county) revenue source, revenue from cities (currently cities contribute very little), and increased state funding to a regional funding source. Currently, there is little activity in these areas.

Bicycle and Pedestrian

Providing accommodations for bicyclists and pedestrians is an important component of developing a multi-modal I-35 Corridor. While bicycle and pedestrian accommodations cannot be incorporated directly along the I-35 freeway alignment,

safe pedestrian and bicycle accommodations can still be integrated on frontage roads and routes parallel to and crossing I-35. The recommended improvements are to:

- Provide an interchange design that focuses on integrating safe pedestrian and bicycle crossing accommodations; understand the two user groups and their diverse needs - on-road cyclists/commuters and recreational or inexperienced bicyclists who may use trails and paths.
- Provide bicycle and pedestrian connections to Park and Ride lots.

The Plan recommends that KDOT and its study partners continue to work with the public and local bicycle and pedestrian groups such as the Johnson County Bicycle Club and KanBikeWalk when interchange improvements and frontage road improvements are planned.

The *I-35 Moving Forward Plan* recommends that KDOT and its study partners continue to work with the public and local bicycle and pedestrian groups about potential improvements.

Planning Next Steps

Immediate Quick Start (0-1 Year) Next Steps

- Reach out to the public and local bicycle and pedestrian groups such as the Johnson County Bicycle Club and KanBikeWalk to solicit ideas related to improved bicycle and pedestrian mobility in the I-35 Corridor.

Mid Term (2-5 Years) Next Steps

- Work with local corridor planning partners and MARC to develop an I-35 bicycle and pedestrian plan.

Long Term (beyond 5 Years) Next Steps

- Bike lanes, which often serve commuter traffic, should be considered on both sides of local street underpasses or overpasses through interchanges, along parallel frontage roads and connecting to park and ride lots.
- Sidewalks or multiuse paths, which serve as part of a local trail system, should be considered to be included on both sides of local street underpasses or overpasses through interchanges, along parallel frontage roads and connecting to park and ride lots.

Key Considerations

- Bike lanes and sidewalks/multiuse paths must be linked to a local transportation system. These accommodations cannot be provided directly along I-35 since it is an Interstate facility;
- Coordinate with local planning partners and MARC's Bicycle and Pedestrian Programs; and
- Consider integrating bicycle and pedestrian accommodations when evaluating enhancement projects within the I-35 Corridor.

Shoulder Running Plan

Shoulder running, also known as temporary shoulder use or hard shoulder running, is a dynamic measure designed to adapt roadway capacity to high traffic volumes on a temporary basis. By allowing vehicles on the shoulder using reduced speed limits or during freeway incident clearance times, it is possible to serve a higher number of people and vehicles to avoid congestion, either totally or partially. The decision to implement shoulder running on a segment is made by an operator in the traffic management center based on operating policies and volume considerations after a check for obstacles. Three approaches to shoulder running are:

By allowing vehicles on the shoulder using reduced speed limits or during freeway incident clearance times, it is possible to serve a higher number of people and vehicles to avoid congestion, either totally or partially.

- *Transit-only shoulder running*, also known as Bus on Shoulder (BoS) – allows only transit vehicles to utilize the designated shoulder in specific conditions and driving regulations. The bus drivers are instructed to use the shoulder under specific circumstances to ensure the safety of the operation and all the freeway users. This type of shoulder use is currently operating successfully on I-35 on a portion of the corridor.
- *Shoulder running for all vehicles* allows all vehicles on the roadway to utilize the designated shoulder when open. Traffic control devices over or adjacent to the shoulder instruct drivers when driving on the shoulder is permitted.
- *Shoulder running for restricted vehicles* allows eligible vehicles on the roadway to utilize the designated shoulder when open. Traffic control devices over or adjacent to the shoulder instruct drivers when driving on the shoulder is permitted. Vehicle eligibility to use the shoulders can then be defined in many different ways. A policy decision can be made concerning what types of vehicles are eligible to use the restricted shoulder running, but could include some combination of transit, HOVs and HOTs.

The I-35 Corridor Optimization Plan is recommending deploying shoulder running to a limited user group rather than to all vehicles. This application could include transit vehicles only (an extension of the current BoS in the region), and to expand eligibility to only select vehicles through permitting, tolling, occupancy, or some other restriction or a combination thereof. The intent is to ensure the added capacity on the shoulder provides a reliable trip with a managed shoulder rather than opening the shoulder to all vehicles. This approach was identified to improve the safety of the shoulder use as well as prepare users for restricted use, priced managed lanes to potentially be implemented in the future.

Coordination with MoDOT will be an important part of the shoulder running plan. In the A.M. peak hour, increased northbound traffic will be traveling on I-35 into Missouri and toward the central business district (CBD). MoDOT will need to make improvements to I-35 from the state line to the CBD, and within the CBD loop to accept the increase in traffic demand. MoDOT completed a study of this segment of I-35 in 2011.

Planning Next Steps

For the I-35 Corridor Optimization Plan, the implementation of shoulder running can be addressed in three phases that can help ensure optimal operations upon deployment. The following sections provide a brief summary of the proposed actions to be taken to prepare for shoulder running operations.

Immediate Quick Start (0-1 Year) Next Steps

- KDOT should continue to discuss shoulder running as a solution with FHWA and its transportation planning partners. Existing legislation should be reviewed to assess what modifications may need to be made to allow expanded BoS or other forms of shoulder running along the corridor.

Mid-term (2-5 Years) Next Steps

- KDOT can take advantage of ongoing and planned maintenance projects in the corridor to prepare the shoulders for future shoulder running. Appropriate improvements might include the rehabilitation or reconstruction of shoulders to ensure sufficient pavement strength to sustain bus loads and regular use by vehicles. The shoulder must have sufficient sub-base to accommodate the heavier loads that will travel on the shoulder. If necessary, the shoulder would have to be reconstructed to provide this strengthened sub-base.

- In the mid-term, KDOT should be developing a concept of operations of how shoulder running would work. KDOT can begin identifying emergency refuge areas outside the shoulder. Because the shoulder would not be available for disabled vehicles when shoulder running is operational, provisions should be made to accommodate such vehicles at regular intervals. These pull-off areas do not need to meet the same pavement requirements as the shoulder since vehicles are not using them as a travel lane.

- KDOT should identify geometric considerations for shoulder use. For example, existing rumble strips on shoulders may present a challenge for shoulder running. Rumble strips can be either moved or removed so that they would not be in the wheel path of the driving surface. Another approach is to move the rumble strip to the middle of the shoulder so that vehicles straddle the strip. Also, drainage inlets can present an obstacle to vehicles using the shoulder on a temporary basis. Providing for proper drainage on facilities with shoulder running can include relocating inlets outside the shoulder, retrofitting inlets, and/or reinforcing existing or adding new inlets.

- Depending on whether the treatment is deployed on the inside or outside shoulder, geometric design and safety improvements may be needed to help offset the loss of the shoulder as part of the clear zone. These improvements might include remediation of fixed objects or vertical clearance issues. In most cases, any design element that is in contrast to general guidelines

used for freeways may require a design exception from Federal Highway Administration. Currently, FHWA treats these exception requests on a case-by-case basis in absence of federal design guidance for shoulder running.

Longer-term (beyond 5 Years) Next Steps

- For long-term operations, KDOT can transition the shoulder running from transit-only to a managed shoulder with restricted access based on selected eligibility requirements. If the improvements noted in the short- and mid-term discussions are implemented, then deployment to a managed shoulder should be relatively straightforward. If pricing is part of the long-term plan, then the infrastructure necessary to facility pricing will need to be installed, along with regional policies related to pricing. In addition, the enhanced motorist assist described within the ITS Plan (Page A-1), should be implemented in parallel to ensure timely clearance of any obstacles to shoulder running. Active Traffic Management, also described on Page A-5, would be implemented in parallel with shoulder running.

Key Considerations

For shoulder running for either transit vehicles or restricted vehicles, KDOT should consider the following factors:

- The deployment should be of significant length (at least three miles) and ensure that no regular bottleneck exists at the downstream end of the shoulder use segment.
- Shoulder running can be implemented in conjunction with variable speed limits and queue warning to ensure optimal operations.
- When implemented with variable speed limits, speed limit signs and lane control signals need to be visible to all vehicles; therefore, the signs should be placed on gantries over every lane of traffic.
- When implemented with queue warning, dynamic message signs show a symbol or word and/or flashing lights to inform travelers of the presence of downstream stop-and-go traffic (based on real-time traffic detection).
- Either the left or the right shoulder can be used for the application, depending on the facility conditions. It is not recommended to apply shoulder use on both left and right shoulders of a facility at the same time. A consistent application of the left or right shoulder should be used between logical termini if both left and right shoulders are used in the corridor.
- Video cameras should be regularly spaced to allow operators to check for obstacles before opening the shoulder to traffic and to monitor operations while shoulder use is permitted. Operators can detect vehicles in the refuge areas using video cameras and/or vehicle detection technology. Each

Emergency Refuge Area should contain an emergency telephone linked directly to a regional control center.

- Overhead guide signs should reflect the current use of the roadway. In other words, when the shoulder is open to traffic, guide signs should provide information to the shoulder lane as if it was a permanent travel lane. This can be accomplished with dynamic message signs.
- Shoulder running deployments require standard traffic information to evaluate the need and to deploy the strategy. Data regarding traffic volumes, travel speeds, shoulder availability, and incident presence and location are essential to determine the need for deployment.

Managed Lanes Plan

Throughout the short and mid-term improvement planning, design and implementation process for the I-35 Corridor, it will be important to incorporate the needs of priced managed lanes (also referred to as express lanes) that may be implemented in the long-term strategy. It is recommended that incremental improvement projects maintain right of way, where possible, and possibly provide support infrastructure for managed lanes to ultimately be implemented.

Managed lanes can be implemented on the inside lane or outside lane of a facility. Historically it has been more common to locate managed lanes on the inside of a facility since it is typically used for through traffic, often designated as "express"

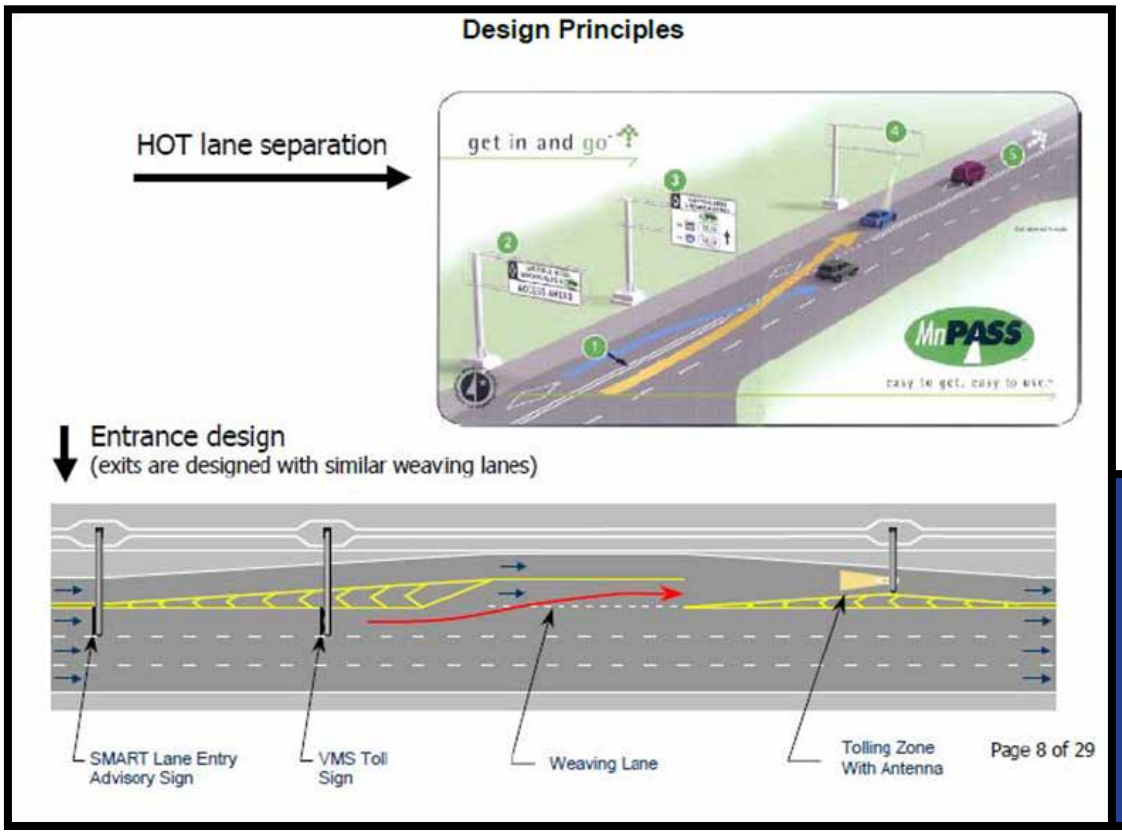

Figure A-1. Example Electronic Tolling Zone for Priced Managed Lanes

Source: Minnesota Department of Transportation

traffic, wanting to travel longer distances along a corridor. A new lane could still be constructed on the outside of a facility if right of way is not available in the existing median, and then general purpose traffic could be shifted and re-designated to the outside lanes and the managed lane to the existing inside lane of the facility. It is important that the future plan for implementing the managed lanes be coordinated with the planned, interim BoS and restricted shoulder running strategies that would be implemented in the short to mid-term so that a future transition to managed lanes can be made smoothly and efficiently and allow for the reuse of infrastructure to the greatest extent possible.

When managed lanes are implemented, the provision of flexible delineators, buffers or some other form of physical separation (where feasible) should be included between the managed lanes and general purpose lanes to enhance safety between these two types of lanes. Furthermore, tolling zones that provide space for overhead gantries to support tolling equipment and with extra-shoulder widths to support enforcement and maintenance of toll equipment should be located between managed lanes ingress and egress access points. It should be noted that priced managed lanes can easily be implemented in logical segments, as shown by many phased implementations from around the U.S. Therefore, managed lanes can be included as a part of the incremental improvement projects, as appropriate, as long as termini points can logically be determined along the corridor.

The traveling public supports the choice that priced managed lanes provide, based on evidence from existing projects across the U.S.

The tolling zones for priced managed lanes will require utility services for electrical power and data communications. In most cases, the existing ITS and/or roadway lighting electrical systems can accommodate the addition of the tolling system at the selected tolling zone locations. Similarly, the data communications networks that support the ITS systems typically have the capacity to accommodate the tolling systems; however, toll systems may want to have dedicated communication lines in dedicated conduits due to the financial data being transmitted. The priced managed lanes tolling infrastructure will need to coordinate with the planned expansion of the fiber backbone described in the ITS Plan, above. The design of ITS and roadway lighting systems for incremental improvements can incorporate the needs of the tolling system as these projects are developed and implemented. The tolling equipment is typically installed on overhead gantry supports (normally cantilevered design) coupled with roadside cabinets to house the end – equipment. Consideration of these general needs for the incremental improvement projects will allow for easier and more efficient implementation of priced managed lanes in the future.

Continued public and governmental communications with FHWA regarding the potential need for priced managed lanes along the corridor is necessary. Well-developed and coordinated public and legislative education programs regarding the use of pricing, detailed discussions of how it would work, and the needs and benefits of managed lanes along the I-35 Corridor can ease acceptance of the concept when it is considered in the future. Evidence from existing managed lanes projects across the

U.S. has shown that the traveling public supports the choice that priced managed lanes provide – pay to travel in an uncongested lane when a traveler needs to, or remain in the general purpose lanes when travel time is not as large of a factor. With priced managed lanes, tolls are not forced on anyone and the additional lanes provide relief of congestion in the general purpose lanes.

It is also important to consider the operations and maintenance efforts of collecting tolls and managing traffic and incidents on the managed lanes. Development of a concept of operations plan and report will document the operations and maintenance requirements and provide sound basis for implementing pricing. The concept of operations will provide specific information regarding technology, organizational and personnel needs, methods and procedures, and governance. The development of a concept of operations normally involves all stakeholders that would be involved in the development, operation and maintenance of the priced managed lanes. There should be some general expectations on toll and revenue even at this early stage.

In addition, as KDOT moves forward with the study of the feasibility of managed lanes for I-35, conducting a traffic and revenue study would provide a more detailed assessment of the potential financial and technical feasibility of priced managed lanes in the Kansas City market. Ultimately, if KDOT or its planning partners chose to implement tolling or pricing of the lanes, toll revenue bonding is likely to be a component of project financing. At that time, an investment grade study may be required to assure bondholders that the priced managed lanes were a viable investment and better lay out the financial structuring of the project. Potentially, an application for a federal TIFIA loan would also be needed to help offset the financing of the project along with the toll revenue bonds. The financing and governance of priced managed lanes can be complex and these are all elements that require further study and analysis prior to making a final decision on implementing priced managed lanes.

Planning Next Steps

Immediate Quick Start (0-1 Year) Next Steps

Incorporate opinion polling on tolling into public role out plans to get a better sense of how project stakeholders and the public feel about pricing to manage congestion.

- Develop plan for coordinating with KTA and other planning partners on future priced managed lanes planning. Governance of a priced managed lane project can be complex and involve multiple partners for implementation, operations, maintenance, etc.
- Develop a traffic and revenue study to better assess the financial and technical feasibility of implementing priced managed lanes along the corridor and the potential for toll revenue to be generated by the priced managed lanes project to offset project capital and operations and maintenance costs.

Mid Term (2-5 Years) Next Steps

- Develop a concept of operations plan and report to document the operations and maintenance requirements and provide sound basis for implementing pricing.
- Develop agency staffing/governance plan for priced managed lanes project and what key partners will be involved.
- Examine existing state legislation and ensure any needed permissions or allowances for tolling/pricing and toll collection are planned to allow for future priced managed lanes.
- Coordinate with planned ITS expansion along corridor to make sure corresponds with future priced managed lanes implementation and need for electronic tolling equipment.
- Coordinate with planned shoulder running concepts and develop a workable transition plan for ultimate shift to of shoulder traffic to priced managed lane facility.

Long Term (beyond 5 Years) Next Steps

- If traffic and revenue study is performed and KDOT finds priced managed lanes to be solution for I-35, perform an investment grade study and apply for TIFIA loan (if applicable) to determine ultimate financial structure and implementation plan for priced managed lanes.
- Develop preliminary engineering concepts or plans which lay out the priced managed lanes and their ingress and egress points. This will help coordinate the long-term project with other planned or committed projects along the corridor.

Key Considerations

- Create a well-developed and coordinated public and legislative education program regarding the use of pricing, detailed discussions of how it would work, and the needs and benefits of managed lanes along the I-35 Corridor to ease acceptance of the concept when it is considered in the future.
- Research, identify and enable necessary legislative and policy changes that would need to be completed prior to implementing priced managed lanes.
- Coordinate with FHWA on how the project fits within available federal tolling and pricing programs and what permissions and approvals need to be granted for the priced managed lane project prior to implementation.
- A multi-modal approach increases public acceptability. However, with a few notable exceptions, most metropolitan areas that have initially implemented

HOV managed lanes have now transitioned them to priced managed lanes (e.g., as HOT or express lanes). Metropolitan areas in the U.S. have found that in order for managed lanes to be effectively utilized and realize the congestion relief benefits desired, it is best to expand eligibility beyond HOVs and transit users to include SOVs willing to pay a toll or fee.

- While revenue generation is one positive component of priced managed lanes, the full implementation costs of a project are rarely able to be fully financed through tolling the managed lanes. Pricing is more an element of congestion management and does provide some revenue to help fund ongoing operations and maintenance costs of the facility.

Fix Key Bottlenecks Plan

Fixing key bottlenecks involves localized roadway improvements that are intended to minimize traffic disruptions from a specific location. These isolated improvements do not necessarily add general capacity to the roadway, but provide additional distance to complete merge or weave maneuvers, separate weaving maneuvers from the through traffic stream, improve entrance or exit capacity, or reconfigure existing roadway or ramp geometrics to provide higher operating speeds.

The study identified current and anticipated future bottlenecks along the I-35 Corridor that create turbulence leading to slowdowns and reduced throughput of the highway. Solutions to address the effects of these bottlenecks can vary based on traffic volumes and roadway geometrics. The study identified the following approaches to addressing the bottlenecks along the I-35 Corridor.

- **Auxiliary Lanes** – Between adjacent interchanges, on-ramp traffic often enters the highway via a merge into the through traffic stream from an acceleration lane of limited length. Downstream, a deceleration lane is developed to accept traffic from the through traffic stream who exit at the downstream interchange. When the acceleration or deceleration lanes are short, traffic flow turbulence occurs. While not eliminating the successive merges and diverges, collectively known as a "weave," auxiliary lanes connect the acceleration and deceleration lanes and often allow a longer distance to accomplish the weaving movements. This solution is recommended for the following areas:
  - Between I-435 and 95th Street in the southbound direction;
  - Between 75th and 67th Streets in both directions; and
  - Between 18th Street Expressway (US 69) and Southwest Boulevard in the southbound direction.
- **Collector/Distributor Roads & Braided Ramps** – Another effective method of eliminating traffic congestion is the use of braided ramps or collector-distributor (CD) roads. Braided ramps allow entering and exiting traffic to interact unimpeded via grade separations while CD roads provide traditional

weaving maneuvers on an adjacent parallel facility separated from the through traffic movements. These solutions do come with a larger price tag but are effective in high traffic volume areas and in areas with closely spaced interchanges. While not invalid solutions, when combining bottleneck improvements with other corridor enhancements, this study is not currently recommending development of CD road systems. However, braided ramps are recommended at the following locations:

- Between U.S. 69 and 75th Street in the southbound direction; and
- Between Southwest Trafficway and West Pennway Street Interchange (by MoDOT).

- **Reconfigure Interchanges** – Modification of interchange geometrics to provide higher speed and/or safer entrance/exit ramps or provide a more traditional interchange configuration can aid traffic flow by providing movements more in line with driver expectation and by reducing the amount of traffic entering or exiting the highway at low speed. This solution could be implemented in the following location:
  - I-635 Interchange with I-35; and
  - Lamar Interchange.

Reconstruction of the I-635 and I-35 interchange would allow for removal of the left entrances and exits in favor of more traditional movements from the right side of the roadway. It could also eliminate the relatively tight ramps that exist in the current configuration and increase the operating speeds throughout the interchange. However, this solution carries a large cost. Therefore, this study does not currently recommend a full reconstruction of the interchange. Rather, maintenance of the current configuration and improvements to specific movements along with an accommodation for an unimpeded future managed lane through the interchange may be a more cost-effective solution.

- Extend Through Traffic Lanes – As development along the corridor continues to occur and as traffic continues to escalate, it may make sense to extend through lane capacity in specific locations to accommodate the increased traffic demand. An extension of through traffic lanes is recommended in the following areas:
  - Extend the fourth through lane from 75th Street south to U.S. 69 in both directions. Also coordination of an ultimate southbound improvement for the long-term to the weave between 75th Street and U.S. 69 would be prudent.
  - Extend the third through lane from south of 159th Street to 175th Street in both directions.

Planning Next Steps

For the I-35 Corridor Optimization Plan, bottleneck areas can be addressed in three general phases to help maintain acceptable service levels throughout implementation of a comprehensive long-term I-35 Corridor Plan. The following sections provide a brief summary of the proposed actions to be taken.

Immediate Quick Start (0-1 Years) Next Steps

- Preliminary plans for extending 4th through lane through 75th Street.

Mid Term (2-5 Years) Next Steps

- In the mid-term, KDOT can identify the top priority bottlenecks with a detailed benefit/cost assessment and begin preliminary designs for improvements. A potential improvement that appears to provide near term benefits would be the 4th through-lane extension from 75th Street to U.S. 69. Whether the improvement is for NB or SB I-35 would be determined through a detailed benefit/cost assessment.

Long Term (beyond 5 Years) Next Steps

- In the longer-term time frame, KDOT can construct the 75th Street Bottleneck and begin developing more detailed conceptual and/or preliminary design plans for implementation of the overall I-35 Corridor Plan and associated longer-term improvements. KDOT can continually evaluate the need for additional improvements based on the established triggers, funding availability and overall long-term I-35 Corridor Plan.

Key Considerations

There are a few issues to consider when implementing a plan to fix bottleneck locations including:

- The Lamar Street interchange is an aging interchange that could benefit from modernization and increased capacity.
- There may be more than one solution for any one bottleneck area. The recommendations in this report are based on the most economical solution for the projected traffic and in conjunction with other I-35 Corridor enhancements. These recommendations could be influenced by variations in traffic volumes and by the type and timing of the corridor enhancements that are ultimately implemented.
- Widening of I-35 in the southbound direction from 119th Street to I-435 and from Johnson Drive to Antioch Road, for any reason, will be challenging and will likely require significant investment due to the close proximity of the BNSF railroad.

- Improvements to bottleneck areas made in the short-term will need to be made with long-term plans in mind. This includes engineering considerations such as retaining wall setbacks, lane widths, and future utility needs as well as the economic and operational benefits of the improvements and how they coordinate with the demand for and construction of a managed lane.

Funding and Financing Plan

The tools used to pay for highway infrastructure continue to evolve and become more complex as limited funds must be allocated both to critical new projects and the maintenance and expansion of existing assets. Traditional sources of funding for transportation projects include federal funding programs (e.g., Surface Transportation, Congestion Mitigation and Air Quality, and Highway Safety Improvement) and state and local programs, including state or local general obligation bonds or city capital improvement plan budget allocations. Most transportation projects receive funding through one of these programs, which pool funding from a variety of taxes or fees and allocate them to projects.

Many states are exploring and taking advantage of these innovative funding and financing tools to help fill the funding gaps in their state's program and get needed projects accomplished.

In addition to the range of traditional funding sources, there are several innovative financing mechanisms that could have applicability for I-35 as KDOT explores potential funding and financing opportunities for the corridor. Terms like "innovative finance" have been used for years to describe the world of project funding and financing outside of traditional gasoline tax-based federal funding and pay-as-you-go project delivery. Most of what was considered innovative just a few years ago is now commonplace and much more diverse than can be accommodated under a single title. Many states are exploring and taking advantage of these innovative funding and financing tools to help fill the funding gaps in their state's program and get needed projects accomplished.

The following sections outline the federal, state, regional, local and private funding and financing options that could have application to the I-35 Corridor as KDOT moves forward with its planning and programming for future I-35 improvements.

Federal Funding and Financing Options

Historically, Federal programs have been a primary source for funding and financing the implementation, maintenance and expansion of interstate facilities like I-35. The current federal transportation program, *Moving Ahead for Progress in the 21st Century* (MAP-21) has modified many of the federal funding and financing programs that have been available to states in previous transportation bills. The following sections summarize the key changes and programs that are now available under MAP-21 that has applicability to I-35.

MAP-21 was signed into law by President Obama on July 6, 2012. Funding surface transportation programs at over $105 billion for fiscal years (FY) 2013 and 2014, MAP-21 is the first long-term highway authorization enacted since 2005. The

program creates a streamlined and performance-based surface transportation program and builds on many of the highway, transit, bike, and pedestrian programs and policies established in 1991. Prior to MAP-21, each apportioned program had its own formula for distribution, and the total amount of federal assistance a state received was the sum of the amounts it received for each program. The program instead provides a total apportionment for each State and then divides that State amount among individual apportioned programs. Also, MAP-21 authorizes a total combined amount ($37.5 billion in FY 13 and $37.8 billion in FY 14) in contract authority to fund five formula programs (including certain set asides within the programs described below):

Federal Aid Apportionments

- **National Highway Performance Program (NHPP)** – Under MAP-21, the enhanced National Highway System (NHS) combines the previous NHS, Interstate Maintenance and Highway Bridge programs and is composed of the Interstate System, all principal arterials (including some not previously designated as part of the NHS) and border crossings on those routes, highways that provide motor vehicle access between the NHS and major intermodal transportation facilities, and the network of highways important to U.S. strategic defense (STRAHNET) and its connectors to major military installations. The I-35 Corridor is a part of the NHPP, which is authorized at an average of $21.8 billion per year to support the condition and performance of the NHS, for the construction of new facilities on the NHS, and to ensure that investments of federal-aid funds in highway construction are directed to support progress toward the achievement of performance targets established in an asset management plan of a State for the NHS. After *Congestion Mitigation and Air Quality* (CMAQ), and *Highway Safety Improvement and Metropolitan Planning* (HSIP) program funds are determined, a state's NHPP funds represent 63.7 percent of the remaining apportionment.

- **Surface Transportation Program (STP)** – MAP-21 continues the STP, providing an annual average of $10 billion in flexible funding that may be used by States and localities for projects to preserve or improve conditions and performance on any Federal-aid highway, bridge projects on any public road, facilities for non-motorized transportation, transit capital projects and public bus terminals and facilities. After CMAQ and Metropolitan Planning program funds are determined, a state's STP funds represent 29.3 percent of the remaining apportionment.

- **Highway Safety Improvement Program** (HSIP) - MAP-21 continues the HSIP to achieve a significant reduction in traffic fatalities and serious injuries on all public roads. With average annual funding of $2.4 billion, the HSIP requires a data-driven, strategic approach to improving highway safety on all

public roads that focuses on performance. After CMAQ and Metropolitan Planning program funds are determined, a state's HSIP funds represent seven percent of the remaining apportionment. States are required to develop a Strategic Highway Safety Plan (SHSP) that lays out strategies to address identified key safety problems. Every State now has an SHSP in place, and MAP-21 ensures ongoing progress toward achieving safety targets by requiring regular plan updates and defining a clear linkage between behavioral (NHTSA funded) State safety programs and the SHSP. I-35 would be included in the SHSP.

- **Congestion Mitigation and Air Quality Improvement Program** (CMAQ) - The CMAQ program is continued in MAP-21 at an annual funding level of $3.3 billion to provide a flexible funding source to state and local governments for transportation projects and programs to help meet the requirements of the Clean Air Act. Funding is available to reduce congestion and improve air quality for areas that do not meet the National Ambient Air Quality Standards for ozone, carbon monoxide, or particulate matter (nonattainment areas) and for former nonattainment areas that are now in compliance (maintenance areas). Under MAP-21, a state's CMAQ program is funded in an amount equal to the state's total apportionment multiplied by the ratio of its FY 2009 CMAQ funding to its FY 2009 total apportionments.

- **Metropolitan Planning Program** (MP) - The metropolitan planning process establishes a cooperative, continuous, and comprehensive framework for making transportation investment decisions in metropolitan areas, like Kansas City. Program oversight is a joint Federal Highway Administration/ Federal Transit Administration responsibility. The program provides guidance and oversight of MPO planning activities including the Long Range Transportation Plan, Transportation Improvement Plan and Transportation Management Areas. Once each state's combined total apportionment is calculated, an amount is set aside for the state's metropolitan planning program via a calculation based on the relative size of the state's FY 2009 metropolitan planning apportionment. From the state's metropolitan planning apportionment, a proportionate share of funds for the state's transportation alternatives program (described below) is to be set aside.

Other MAP-21 Apportionments Applicable to I-35

As an outcome of MAP-21, there are a few additional Federal programs that could have applicability for funding I-35 improvements.

- Transportation Alternatives Program (TAP) - MAP-21 establishes a new program to provide for a variety of alternative transportation projects that were previously eligible activities under separately funded programs. This program is funded at a level equal to two percent of the total of all MAP-21

authorized federal-aid highway and highway research funds, with the amount for each state set aside from the State's formula apportionments. Unless a state opts out, it must use a specified portion of its TAP funds for recreational trails projects. Eligible activities include:

- Transportation alternatives (new definition incorporates many transportation enhancement activities and several new activities);
- Recreational trails program (program remains unchanged);
- Safe routes to schools program; and
- Planning, designing, or constructing roadways within the right-of way of former Interstate routes or other divided highways.

- **Research Programs** - Since KDOT is considering several cutting edge strategies and technology applications for I-35, certain improvements could qualify for funding from several federal research programs.

- **Highway Research and Development Program** – MAP-21 provides $115 million per year for the Highway Research and Development program. Research areas include highway safety, infrastructure integrity, planning and environment, highway operations, exploratory advanced research, and the Turner-Fairbank Highway Research Center.
  - State Planning and Research (SP&R) - MAP-21 continues the SP&R, as a two percent takedown of four core programs: NHPP, STP, CMAQ, and HSIP. At least 25 percent of these funds have to be used for research purposes. States are required to agree on what portion of their share of their SP&R funds they make available to the Secretary to implement the results of the F-SHRP program.
  - Technology and Innovation Deployment Program – Separate funding is provided for the technology innovation and deployment program ($62.5 million per year) to accelerate implementation and delivery of new innovations and technologies that result from highway research and development to benefit all aspects of highway transportation. At least $12 million per year of these funds must be used to accelerate the deployment and implementation of pavement technology.
  - Significant Freight Provisions - MAP-21 includes a number of provisions to improve the condition and performance of the national freight network and support investment in freight-related surface transportation projects. It includes incentives to prioritize projects that advance freight performance targets. U.S. DOT, in consultation with partners and stakeholders, will develop a national freight strategic plan. States are encouraged to develop individual freight plans and establish freight advisory committees. The I-35 Corridor would be an integral part of KDOT's and the U.S. DOT's freight plan since it is a NAFTA corridor and

freight traffic is projected to grow significantly along the corridor in the next 30 years.

Federal Debt Financing and Credit Assistance Programs

Over the last few decades, congress and states have looked for new ways to expand the capacity of the federal-aid program to deliver projects as revenues have fallen behind needed infrastructure investment requirements. As a result, states and other project sponsors have available an array of project finance tools to facilitate the delivery of projects and help fill funding gaps. The following are typical federal financing vehicles that are in use today for borrowing to pay for infrastructure projects. KDOT has used many of these financing vehicles to finance the state's critical transportation needs and some may have applicability to I-35 in the future.

- **Taxable/Tax-Exempt Revenue Bonds:** Public or private entities can issue bonds to pay the cost and expenses of transportation projects. Proceeds of the bonds may only be used for the subject project or as provided in the bond indenture authorizing bond issuance. The bonds can be repaid with any number of revenue sources which will impact the interest rate, required coverage ratio, and overall risk of the debt issuance. Typically, bonds issued by a public agency are tax-exempt, meaning that interest paid to investors is not taxable. Because the interest is not taxable, investors are willing to accept a lower interest rate than would be required for a taxable bond with a similar risk profile. Tax exempt debt is preferable from the issuer's standpoint because they pay less interest and can therefore raise more funds with a given revenue stream. KDOT's current T-WORKS Program is a tax exempt bonding program.

  Taxable bonds are used more frequently in transactions where a private entity is issuing the debt. If private entities cannot somehow qualify for tax exempt debt, they will issue taxable debt or seek direct loans from one or more banks, referred to as 'bank debt.'

- **Grant Anticipation Revenue Vehicles** (GARVEEs) – A GARVEE is a term for a debt financing instrument, such as a bond, note, certificate, mortgage, lease, or other technique, that has a pledge of future Title 23 Federal-aid funding. GARVEEs enable a state to accelerate construction timelines and spread the cost of a transportation facility over its useful life rather than just the construction period. The upfront monetization benefit of these techniques needs to be weighed against consuming a portion of future years' receivables to pay debt service. This approach is appropriate for large, long-lived, non-revenue generating assets.

- **Grant Anticipation Notes** (GANs) – GANs are transit agency debt financing vehicles which utilize federal-aid funding under Title 49, not Title 23 as in GARVEEs. GANs also do not include debt-related financing costs such

as interest and issuance costs. Federal transit formula funds can only be anticipated in the short term (one or two years) because they are subject to the annual congressional appropriation process, thus GANs are often used for shorter-term debt issuances.

- **State Infrastructure Bank** (SIB): State Infrastructure Banks are revolving infrastructure investment funds for surface transportation that are established and administered by states. A SIB, much like a private bank, can offer a range of loans and credit assistance enhancement products to public and private sponsors of Title 23 highway construction projects or Title 49 transit capital projects. The requirements of Titles 23 and 49 apply to SIB repayments from Federal and non-Federal sources. All repayments are considered to be Federal funds. SIBs give states the capacity to make more efficient use of its transportation funds and significantly leverage Federal resources by attracting non-Federal public and private investment. Alternatively, SIB capital can be used as collateral to borrow in the bond market or to establish a guaranteed reserve fund. Loan demand, timing of needs, and debt financing considerations are factors to be weighed by states in evaluating a leveraged SIB approach.

- **Transportation Infrastructure Finance and Innovation Act** (TIFIA) - The TIFIA program provides Federal credit assistance to eligible surface transportation projects. MAP-21 dramatically increases funding available for TIFIA, authorizing $750 million in FY 2013 and $1 billion in FY 2014 to pay the subsidy cost (similar to a commercial bank's loan reserve requirement) of supporting Federal credit. An one billion dollar TIFIA authorization will support about $10 billion in actual lending capacity. MAP-21 also calls for a number of significant program reforms, to include: a ten percent set-aside for rural projects; an increase in the share of eligible project costs that TIFIA may support; and a rolling application process.

- **Section 129 Loans** - Section 129 of Title 23 allows Federal participation in a state loan to support projects with dedicated revenue stream including tolls, excise taxes, sales taxes, real property taxes, motor vehicle taxes, incremental property taxes, or other beneficiary fees. Similar to SIBs, Section 129 loans allow states to leverage additional transportation resources and recycle assistance to other eligible projects. States have the flexibility to negotiate interest rates and other terms of Section 129 loans. When a loan is repaid, the state is required to use the funds for a Title 23 eligible project or credit enhancement activities, such as the purchase of insurance or a capital reserve to improve credit market access or lower interest rate costs for a Title 23 eligible project. One important distinction between SIB and Section 129 loans is that projects that receive assistance from repaid Section 129 loans are not

required to meet the same number of Federal requirements as those using SIB loans.

Federal Tolling and Pricing Programs

MAP-21 makes changes to the statutory provisions governing tolling on highways that are constructed or improved with federal funds (23 USC 129). One significant change to the tolling and pricing programs is the removal of the requirement for an agreement to be executed with the U.S. DOT prior to tolling under the mainstream tolling programs. Other changes include the mainstreaming of tolling new interstates and added lanes on existing interstates, which was previously allowed only under the I*nterstate System Construction Toll Pilot Program* and the *Express Lanes Demonstration Program*. The *Value Pricing Pilot Program*, which allows congestion pricing, is continued (but without any discretionary grants), as is the *Interstate System Reconstruction and Rehabilitation Pilot Program*, which allows tolling of all lanes on an existing interstate highway when required for reconstruction or rehabilitation purposes. Under MAP-21, tolling agreements between public authorities and the FHWA prior to converting an HOV facility to an HOT lane is no longer required (23 USC 166). MAP-21 also requires that all federal-aid highway toll facilities implement technologies or business practices that provide for the interoperability of electronic toll collection by October 1, 2016. This means that toll facilities in different states or regions need to coordinate their electronic tolling technologies to allow interoperability between different toll authorities and systems.

The latest provisions for the *Express Lanes Demonstration Program* and the *Value Pricing Pilot Program* would have the greatest applicability to I-35. These programs would have applicability to I-35 if KDOT decided to implement priced managed lanes or some form of priced shoulder running strategy since I-35 is a federal interstate facility.

Federal Grant Opportunities

In recent years, the U.S. DOT has offered several grant program opportunities to help fund the costs of needed transportation projects. The Transportation Investment Generating Economic Recovery, or TIGER Discretionary Grant program, provided an opportunity for the U.S. Department of Transportation to invest in road, rail, transit and port projects that promise to achieve critical national or regional objectives. Congress dedicated $1.5 billion for TIGER I, $600 million for TIGER II, and $527 million for TIGER III to fund projects that have a significant impact on the nation, a region or a metropolitan area. Historically, TIGER has been a very competitive process. Projects are typically multi-modal, freight-focused, multi-jurisdictional or otherwise challenging to fund through existing programs. Projects also need to meet key program goals including improved sustainability, livability, and economic productivity, in addition to more traditional safety and congestion relief goals. It is uncertain if U.S. DOT will continue grant programs like TIGER in the future. However, if TIGER or a similar grant program is made available, many of the

strategies being recommended for I-35 would fit well with the purpose and goals of this grant program.

Major Project Requirements

According to the SAFETEA-LU legislation of 2005, a "Major Project" is defined as "a project with a total estimated cost of $500 million or more that is receiving financial assistance." Based on preliminary estimates, the I-35 Corridor improvements would fall into the Major Projects category. In order for federal funding to be authorized for the financing of Major Projects, the project owner must demonstrate to the FHWA that the project has been carefully planned out, risks have been carefully considered and mitigated, financing requirements and strategies have been clearly defined, and the implementation of the project delivery has been carefully planned. The three Major Project requirements include (1) cost estimating, (2) a financial plan, and (3) a project management plan. Throughout the life of the project, owners are required to submit financial and management plans and are subject to various FHWA review processes before federal funding is released for the project. These Major Project requirements should be kept in mind as KDOT continues to plan for the future implementation and funding of the I-35 corridor.

State Funding and Financing Options

T-WORKS Program

In May 2010, the Kansas Legislature passed Transportation Works for Kansas (T-WORKS), an $8 billion 10-year transportation program. T-WORKS is a bonding program designed to create jobs, preserve highway infrastructure, and provide multimodal economic development opportunities across the state. T-WORKS projects are funded primarily through a 4/10 cent sales tax. With T-WORKS in place, total KDOT revenues for the 10-year program are anticipated to increase by total of $2.7 billion. The sources for this additional funding are 0.4 percent increase in state sales tax deposits beginning in SFY 2014, authority to issue bonds up to 18 percent of state highway revenues that are already in place and an increase in the heavy truck registration fees (part of vehicle registration fees) effective in SFY 2013. Under the T-WORKS program, 100 percent of the highway system's preservation needs are met. Additionally, investment in transit, aviation and rail is increased.

Below is break down of each major program and how much funding each program will receive over the 10 years of the program.

- Highway preservation projects: $4.2 billion.
- Highway modernization and expansion projects: $1.8 billion.
- Transit services: $100 million.
- Aviation projects: $46 million.
- Rail projects: $40 million.

- Special City County Highway Fund (Local Roads): $1.6 billion.
- Total program: $7.8 billion.

In addition to the revenue generated by the 4/10 cent sales tax increase, Kansas receives funding for transportation from a 24-cent motor fuels tax, 26-cent diesel fuel tax, 6.3 percent sales and use tax, vehicle registrations and permits, operating grants, capital grants, and other sources (e.g., investment earnings, appropriations from other state programs).

At the current time, the majority of the T-WORKS Program funding has been allocated to needed projects across the state. In addition, the funding program only provides funding for a 10-year period through FY 2020. Since the I-35 preferred strategy recommends improvements for at least a 30-year horizon, it is uncertain at this time what future funding at the state level will be over this horizon and what portion of it can be dedicated to I-35. In the short-term, some minor funding from T-WORKS that has not yet been allocated could be available for I-35, but if more significant investment were needed to improve the corridor, funds or financing from other revenue sources would need to be investigated and incorporated to meet the corridor's challenging needs.

Potential State Funding and Financing Options

The following section lists several revenue sources being explored or utilized in other states to supplement their current, more traditional state funding sources that were determined to have applicability for I-35. Not all of these funding sources are in use today and many may be politically or functionally difficult to impose at the present time. However, since KDOT is considering improvements to I-35 over a future, 30-year horizon, many of these funding mechanisms could become more prominent and widely accepted in the future.

- **Variable Fuel Tax** – All states have some form of motor fuel tax; however there are a few states that have implemented variable fuel taxes or sales taxes on fuels due to the declining value of this taxing mechanism over time. Six states index their gasoline taxes to inflation – a design that enables them to account for changes in purchasing power over time. Florida and Maine adjust state gas taxes by the consumer price index; Nebraska by a state funding formula; and Kentucky, North Carolina and West Virginia link their gas tax to the fuel wholesale prices, which tends to grow with inflation. Nine states add a sales tax to gasoline purchases or tax fuel distributors or suppliers (e.g., California, New York, Michigan).

- **Toll Revenue Bonding** – Many state DOTs are turning to tolling as a possible financing option, especially when considering innovative strategies such as priced managed lanes. At the present time, the state of Kansas' enabling legislation allows the state to study the feasibility of tolling projects, but does not grant the authority to fully implement a tolling project without

further governance and legislative changes. Many state DOTs have found opportunities to partner with other public, quasi-public or private entities to finance and implement transportation projects through toll revenue bonding. The Kansas Turnpike Authority (KTA) is the existing turnpike operator in the state of Kansas. As such, there are opportunities for KDOT to partner with the KTA to help finance improvements, such as priced managed lanes, on I-35. At the present time, the Kansas Legislature is considering possible changes to the governance and organization of the KTA and whether it should become a part of KDOT. Depending on the outcomes of these discussions, the ability to implement toll projects in Kansas via KTA or KDOT could be modified.

In addition to partnering with KTA, KDOT could partner with other entities, such as Regional Mobility Authorities, Transportation Corporation, or private developers (all described later in this section) to finance and implement priced managed lanes on I-35. These types of partnerships would be dependent on enabling state legislation and policies to move forward, but may offer a way to use toll financing on I-35 and secure additional revenue for capital and ongoing operations and maintenance costs.

- Mileage-based User Fees – Mileage-based user fees, sometimes referred to as vehicle-miles traveled (VMT) pricing, are distance-based fees levied on a vehicle user for use of a roadway system. As opposed to tolls, which are facility specific and not necessarily levied strictly on a per-mile basis, these fees are based on the distance driven on a defined network of roadways. To date, this method of revenue generation has been implemented only for trucks (e.g., Oregon) and only exists as a proposal for all vehicles (i.e. to replace or supplement the motor fuel tax). It has been tested on a pilot basis in Oregon and 12 other cities in the U.S., but no one has yet fully implemented a mileage-based user fee that applies to all vehicles.

- Cordon/Area Pricing – Priced zones minimize congested conditions in dense urban environments (generally city centers and the corridors providing access to them) by charging vehicles for travel during peak periods, either as they pass a set boundary (cordon) or travel within a specified zone (area). A wide range of charging options exist for these facilities, including varying charges by time-of-day, by vehicle type, and by entry point. Charges can also be levied once (per 24-hour period) or each time the cordon is passed or the zone is entered. To date, such facilities are only in operation internationally. While this concept would have some applicability to I-35 since it is known to be a heavy commuter corridor into the Kansas City central business district (CBD), to be truly effective this concept would need to be applied to all major routes approaching the CBD, not just I-35.

- Surcharge on Moving Vehicle Violations – The state of Texas developed the Driver Responsibility Program, which established a system that assesses a

surcharge based on certain traffic offenses committed. Points are assigned to moving violations, and are applied to drivers based on the type of offense and the time period in which the offense was committed. (More information about the Driver Responsibility Program is in Chapter 708 of the Texas Transportation Code). The original idea behind the program, which took effect in late 2004, was to assess large additional fines for certain violations to discourage those types of offenses (e.g., driving while intoxicated, speeding, etc.) and raise money for highway projects and trauma care. To date, the program is still being evaluated to determine its success and has had issues with collection of the additional fines, but it has been viewed as an innovative way to tie user violations on the transportation system with transportation funding needs.

Local and Regional Funding Options

There is a range of local funding and financing options that could help KDOT and the region realize infrastructure improvement benefits for I-35 that would be challenging to accomplish without local partnerships and contributions. When transportation infrastructure is built, it often has a positive effect on the local economy. By partnering with the state on infrastructure funding, it allows the opportunity to leverage funds that separately would not have been enough to take on the project alone. This allows partners to accelerate the time it takes to get a project to completion and can help avoid additional costs due to inflation.

KDOT Local Partnerships

Under T-WORKS, an increased emphasis has been placed on improving the Kansas economy through the use of transportation investments. KDOT has worked to create more flexibility within its programs to address economic opportunities as they arise. The following list briefly summarizes the programs available to KDOT's local partners today.

Economic Development Partnership Opportunities
(Only those applicable to I-35 are shown)

- Economic Development (ED) Program - The ED program uses transportation investments to recruit new businesses and encourage growth of existing businesses. This is a reimbursable grant program funded at $10 million annually.
- Transportation Revolving Fund (TRF) - The TRF provides low-interest loans to local governments for roadway improvements.
- Transportation Economic Development Loan Program (TEDL) - TEDL provides bridge loans for transportation projects that have a direct tie to economic growth. TEDL projects require a close partnership between state and local governments and the private business that is providing the economic opportunity.

Other Partnership Opportunities

The following programs are other ways in which locals can partner with KDOT to improve the state's transportation system.

- **Federal Fund Exchange Program** - This program allows local public agencies to trade its federal funds with KDOT in exchange for state dollars. Exchanging federal funds for state funds often allows the local agency more flexibility. The amount of state funds available for exchange varies by year.
- **City Connecting Link Resurfacing Program** (KLINK) - The KLINK program provides reimbursable grants to local governments for the purposes of maintaining state highways that pass through the city limits of a community. The program is funded at $6 million per year.
- **Geometric Improvement Program** (GI) - The GI program is directed at improving the geometrics of roadways and includes reimbursable grants and is funded at $6 million per year. Geometric improvements include items such as intersection improvements, widening narrow roadways, adding lanes, storm sewer, and curb and gutter improvements.
- **Corridor Management** - This $6 million a year program is intended to help communities plan for growth and future access along state highways.
- **Safety** - These programs are geared towards safety improvements such as intersection signals, roundabouts, and turning lanes. The programs, which use both federal and state funds, are funded at $8 million on a two-year cycle.
- **Intelligent Transportation Systems** (ITS) - The ITS program uses technology such as sensors, computers, and communications to provide traveler information, increase safety, and improve mobility. The program is funded at $2 million annually.
- **Transportation Enhancement** (TE) - The TE program is a federally funded program (now a part of Transportation Alternatives Program under MAP-21) and is dedicated to non-traditional transportation projects, such as bicycle and pedestrian trails, streetscapes, and renovation of historical transportation facilities. The program is typically funded at around $10 million per year.
- **Transit** - New under T-WORKS, KDOT has the opportunity to provide $825,000 in discretionary funding to projects that will increase public transportation options and usage.
- **Safe Routes To School** (SRTS) - This federal reimbursement program (now a part of Transportation Alternatives Program under MAP-21) provides $1 million per year to assist School Districts in providing safe zones around schools. The program consists of both infrastructure projects and educational activities and resources. There are approximately 123 public and private schools within a two-mile buffer of I-35.

Local Option Taxes and Fees

Cities and counties often levy a host of local taxes to help pay for needed transportation projects. While these taxes and fees are not directly levied by KDOT, they still offer key ways for local partners to help share costs for I-35 improvements.

- **Local Option Sales Tax** - A local option sales tax (LOST) is a special-purpose tax implemented and levied at the city or county level. A local option sales tax is often used as a means of raising funds for specific local or area projects, such as improving area streets and roads, or refurbishing a community's downtown area.

- **Property Tax** - Property taxes are the most universal local revenue source in the United States. Although they are also imposed by some state governments, their primary function is to fund services that are administered at the most local levels, such as schools and fire protection. They are particularly well-suited for financing local governments because they are based on immobile assets, such as land and buildings, and are therefore not easily evaded. There are two primary rationales for the use of property taxes in transportation finance. The first is based on the idea that accessibility is a primary determinant of land value. By establishing access to land, the creation and maintenance of street and road networks play a major role in giving that land value, and therefore taxation of that value is an appropriate way to finance those networks. The second rationale is that transportation services (including public transit operations and street maintenance) are basic public services that provide broad public benefits. An individual may not use the bus system, but may have a relative who does (like the school system), or may rely on it on rare occasions (like the fire department). Similarly, an individual may not drive on the city streets, but benefits from the delivery of mail or emergency services along them. As the primary revenue source for other public services, it makes sense to use property taxes for these transportation services as well.

Value Capture

Value capture refers to cases where the public sector is able to capture some of the increased value, usually property value, which results from public investment. Some transportation investments, such as a new freeway or interchange, increase the value of adjacent properties by improving access. The amounts recovered from such transportation projects may range from the partial payment of initial capital costs to full repayment of capital costs and operating expenditures. The most basic methods of funding capital facility costs involve development impact fees, assessment districts, and special taxes.

To combat the issues of attracting tenants to sites in need of redevelopment, many development incentives are provided by the federal government, state of Kansas, and local cities and counties. Most, if not all, development incentives encourage or require

the redevelopment of existing sites instead of utilizing green-field, or previously undeveloped, sites. Most Development Incentives take the form of loans, tax credits, or tax abatements and have specific project requirements.

- **Special Assessment Districts** - A special assessment district or dependent financing district is a traditional method of privately financing local improvements. Special assessments are authorized in all 50 states either under explicit enabling legislation or under state constitutional provisions. Virtually all special assessment districts require some type of landowner or voter approval of inclusion in the districts. The major limitation on special assessments is that they can be used only to finance facilities that provide local benefits. They cannot be used to finance facilities that provide general, community-wide benefits. This requirement makes the implementation of special assessments for specific purposes much more complex as well as more legally difficult to institute than general-purpose taxes. In recent years, there has been some liberalization of this policy, but in most areas, it has not been significant enough to make special assessments a viable alternative to fund major components of the highway system.

  In general, the greatest problem in using special districts to finance roads is that, because the highway system is an open system, it is difficult to establish a district that includes all those who benefit from a road, while excluding those who do not benefit-except for small-scale local roads. As such problems do not exist with closed systems (like water and sewer systems), special districts are most successful in financing such facilities. In many states, legislatures have passed new enabling legislation that allows special districts to be used to finance a broader range of facilities than in the past. These districts often go by such names as improvement districts, road districts, metropolitan districts, and building authorities. In most cases, the districts serve the same general purpose as the traditional special assessment district, but they often are not limited to the use of assessments on property, such as front footage charges or acreage fees.

The following example programs offer specific vehicles to fund improvements within the districts through the levying of additional real property and/or sales taxes.

- **Tax-Increment Financing Districts** (TIF) - A TIF collects a portion of net new real property, earnings, and sales taxes. These funds are then used to finance development and other improvements within the TIF district.

- **Transportation Development Districts** (TDD) - A TDD can be funded through special assessment, real property tax, or sales tax. Funds are used to support transportation improvement projects like signage, road conditions, or other transport-related needs within the districts of the TDD.

- **Community Improvement Districts** (CID) - A CID can levy real property and/or additional sales taxes to be used for certain improvements or services within the boundaries of the CID.

- **Development Impact Fees** - Typically a one-time charge applied to offset the additional public-service costs of new development. They are usually applied at the time a building permit is issued and are dedicated to provision of additional services, such as water and sewer systems, roads, schools, libraries, and parks and recreation facilities, made necessary by the presence of new businesses and residents in the area. They are essentially user fees levied in anticipation of use, expanding the capacity of existing services to handle additional demand.

While TIF, TDD, and CIDs are attractive vehicles for developers to finance redevelopment projects, care must be taken to ensure that the additional levies required by these programs do not discourage current or potential businesses from remaining or locating in the surrounding area.

Regional Funding and Financing Options

In order to focus on a more region wide project, states often turn towards transportation corporations or regional mobility authorities as a way to finance and manage a larger, more complex regional project.

- **Transportation Corporation** (TC) - A Transportation Corporation (TC) is a not-for-profit entity formed with the purpose of developing and promoting a major transportation project. The TC acts in promoting the transportation project and promotes economic development in the state and will not act as the agent of any private interests. A TC is formed to facilitate the funding, promotion, planning, design, construction, maintenance and operation of a transportation project. The TC is a nonmember, non-stock corporation. A TC can often utilize tolling as a financing mechanism, but can also use other taxing mechanisms, such as a sales tax, as well.

- **Regional Mobility Authority** (RMA) - RMAs are an emerging and innovative tool that enables politically created subdivisions to collect and invest transportation funds to improve regional mobility. Creation of a Regional Mobility Authority would require the state of Kansas to adopt legislation authorizing the establishment of an RMA. Funding for RMA's most typically is generated through the collection of tolls as a primary source of revenue; however other revenue sources such as sales taxes or vehicle taxes/fees can be voted on, and if approved, collected by the RMA to fund projects. The objectives of an RMA are to increase resources for regional mobility projects. Often they are prohibited from using existing funding sources. Additionally, projects implemented by an RMA can be for other modes beyond roadways,

such as transit, passenger rail, and airports. Texas and Arkansas both have formed RMAs to focus on financing needed regional transportation priorities.

- **Bi-State Tax** – In 1996, a public/private partnership began funding Union Station's $250 million restoration through passage of a bi-state tax. This tax was the first of its kind funded by a 1/8 cent sales tax in counties on both sides of the Kansas City metropolitan area. Since I-35 is a regional facility that crosses the state line, a bi-state tax could help fund corridor transportation solutions in both Kansas and Missouri.

Private Sector Partnerships

Many public agencies who have faced financial difficulties funding highways or other infrastructure assets have found partnering with private sector entities to be an attractive means to get needed projects done. In its simplest form, a private sector entity could agree to provide private equity to a project, such as a new or improved interchange on I-35, to help fill a funding gap and get a project completed. Private industry can also play a role in TIFs, TDDs and other local funding and financing options.

Today, a key focus in the transportation industry is on Public-Private Partnerships (PPPs) and how these types of partnerships can help states achieve a desired level of service for an infrastructure project over the long-term while transferring undesired risks to the private sector. A PPP is an agreement between public and private sector parties that transfers some or all infrastructure functions to the private sector for some predetermined period of time. Almost all project components (aside from some level of oversight) can be transferred to the private sector, including project development, design, construction, financing, operations and maintenance. If 'traditional' approaches do not fit a project's needs, for whatever reason, various degrees of private sector involvement are available, from design-build contracts for new construction projects to long-term operations concession agreements. Specific project characteristics, enabling state legislation and policies, and prevailing market trends will guide what is desirable and acceptable in a PPP arrangement for a given project. There are many possible variations in the structure and function of a PPP contract, but three standard variations on the continuum are described below and are becoming popular in the U.S. as states continue to explore and implement these partnerships for private industry.

- **Design-Build** (DB) - A design-build contract typically involves a fixed fee contract with a single firm, joint venture, or consortium for facility design and construction services together. The public sector obtains funding for the project and retains responsibility for operations and maintenance services after construction is complete. The private sector assumes the primary design and construction risk for completing the project for a fixed price on a date certain schedule. Generally, the use of the design-build approach enables projects to

be completed faster and potentially with less funding (due to fewer change orders) because timing and coordination of design and construction are all under the control of a single entity. The Kansas Gateway project is an example of the state's first DB project.

- **Design-Build, Operate, Maintain** (DBOM) - Design-build, operate, maintain contracts, also known as "turnkey" contracts, would combine the design-build responsibilities described above with private operation and maintenance of the assets for a fixed period of time, with the public sector retaining all financial responsibility for construction and maintenance costs throughout the life of the contract. Under this PPP arrangement, the private entity would submit a fixed price contract that would cover not only design and construction, but also operations and maintenance costs for a period of time, usually long-term in nature. MoDOT utilized a DBOM for their Safe & Sound, 800 Better Bridges Program.

- **Concessions/Design-Build, Finance, Operate/Maintain** (DBFOM) - Concession transactions have been structured around all types of revenue generating infrastructure, from airports and parking garages to toll roads. A concession agreement involves the long-term lease of an infrastructure asset to a private entity, who agrees to build, operate, maintain, or improve the asset in exchange for the right to collect toll revenues or other payments from the public entity (Availability Payments). Concessions first gained popularity in the U.S. as multi-billion dollar transactions for the Chicago Skyway and Indiana Toll Road. These were unique because they were "asset monetization" or "brown field" transactions where an existing facility was used to obtain a large up-front payment in return for turning over the toll revenue stream and operations of the asset for a lengthy period (75-99 years.) More recent concessions have been done for new priced managed lanes projects, such as the I-95 and I-495 HOT lanes projects in Virginia and would have a greater applicability to I-35 and its preferred strategy.

In most cases where the private entity finances the project, it issues debt (preferably tax-exempt debt such as Private Activity Bonds) in conjunction with some equity contribution from one or more private partners in the venture. The private partner may assume traffic and revenue risks by collecting tolls (as is the case for Brisa in the Northwest Parkway Concession in Denver, Colorado) or could leave this risk with the public sector and opt to accept a fixed stream of "availability payments" from the public partner. Availability Payments are most often used in instances where the money derived from the project (toll revenue) is not sufficient to repay all costs of the private partner. The Florida Department of Transportation (FDOT) used this approach for adding tolled lanes to I-595 in 2009. In this instance, FDOT collects and keeps all of the toll revenue. The concessionaire builds the tolled lanes and maintains the entire facility in return for a series of Availability Payments from FDOT, that can

fluctuate based on the concessionaires level of performance on specific operations and maintenance provisions of the contract. In this case, the private sector is not taking on traffic and revenue risk.

In order for KDOT to implement these various types of PPPs, legislative changes would need to be considered at the state level to allow these types of partnerships. Currently, KDOT has legislative authority to implement the state's first DB project, the Kansas Gateway. This opens the door for the state to evaluate further over time if it finds PPPs to be an effective tool for project delivery, and ultimately another tool for project financing.

Toll Revenue Potential

The projected toll revenue for the priced managed lanes and restricted shoulder running strategies could contribute some revenue to offset the capital costs of the proposed strategies through toll revenue bonds. This annual toll revenue also helps provide a dedicated revenue stream for ongoing operations and maintenance costs of the priced managed lane and/or shoulder running. The projected traffic and estimated revenue generated by a priced managed lane facility is dependent on a variety of factors including travel time savings, drivers' values of time, toll rates and future socioeconomic development near the corridor. These factors are used in a travel demand model to project traffic. For this planning level analysis, the team utilized the I-35 calibrated model for Phase 1 of the project and CDM Smith's toll diversion model to estimate managed lane traffic and revenue. Table A-1 shows a snapshot of the annual toll traffic and revenue forecast for the priced managed lanes in the preferred strategy package, assuming transit and HOV 2+ traffic would travel free. The annual managed lane toll traffic in year 2040 is expected to be 34 million and annual managed lane revenue is expected to be $13.9 million.

Table A-1. Annual 2040 Toll Traffic and Revenue Forecast

Year	Annual Transactions	Annual Revenue
2040	34,300,000	$13,834,589

Key Considerations

- With KDOT's current transportation program only covering a 10-year period through FY 2020, future funding for the state is uncertain, including the amount that can be allocated and prioritized for I-35 improvements.
- It is likely that one revenue source will not be available to meet the needs of I-35 since it is a federally-designated Major Project. Rather, a mix of funding and financing mechanisms will likely be needed to complete the recommended improvements over the 30-year horizon.

- Legislative changes may need to be evaluated and enacted prior to implementing certain funding and financing sources in the state, such as tolling, mileage-based user fees, certain local value capture methods, regional mobility authorities, public-private partnerships, among others.
- Priced managed lanes or restricted shoulder running strategies help provide some additional revenue for the I-35 capital improvements and ongoing operations and maintenance costs through the incorporation of tolling.

No one funding or financing source will be able to pay for all needed project implementation costs. It will likely take a mix of funding and financing options to deliver the improvements proposed for I-35.

Conclusion

While all of the funding and financing options outlined within this section have potential applicability to the I-35 corridor, it is likely that no one funding/financing source will be able to pay for all needed project implementation costs. With today's limited funding, it will likely take a mix of funding and financing options to deliver the infrastructure improvements proposed for I-35 and its diverse improvement strategies. However, knowing and understanding what public and private funding programs are available can provide KDOT and its planning partners a head start in identifying potential funding and financing resources as they move forward with their implementation planning for I-35.

Policy, Governance and Legislative Plan

Managing corridor capacity through engineering and technology enhancements could also require changes to KDOT policies and standards, changes or clarity in governance structure, and potentially require legislative action. The enhancements below are considered from each of these necessary perspectives.

Shoulder running

When the Johnson County Transit (JCT) started running The JO Xpress, an enhanced bus on shoulder (BoS) service along I-35 linking Johnson County with downtown Kansas City, Mo., there were several issues to consider related to hard running shoulder use for vehicles during peak times. Similar issues will need to be considered when expanding the existing BoS service along the corridor and allowing additional restricted vehicles to use the shoulders during the peak periods.

KDOT is responsible for the operation and maintenance of I-35 within this corridor. KDOT's design standards and policies would need to be examined to identify revisions necessary to include expanded shoulder running. The following would need to be addressed:

- Inter-agency agreements (KDOT–JCT/KDOT-KHP/KDOT-MARC-FHWA);
- Signage and striping – practices and standards;
- Maintenance;
- Insurance (Liability and indemnification);

- Safety and traffic flow;
- Roadway improvements (areas behind the shoulder along the mainline of I-35 and ramps that could be widened to accommodate vehicle breakdowns and crash investigation sites);
- Increase ITS signs and monitoring system along I-35 to evaluate route performance, congestion, and determine when shoulder running will be allowed; and
- Use lane control signage (sign gantries) to notify motorists when traffic can utilize the shoulder.

Enforcement issues are important in the context of preparing agreements and implementation of shoulder running. Enforcement is based on regulations by state and local ordinances or specific legislation. During the bus on shoulder process, there were ten traffic laws that needed revision through the Kansas legislative process.

When deployed by other state departments of transportation, including Virginia, Washington and Minnesota, the most common concerns expressed by both legislators and users were safety and an understanding of how shoulder running would be deployed. Research conducted by the Texas A&M Transportation Institute, among others, has shown that both primary and secondary accidents in corridors that use hard shoulder running has decreased.

Tolling related to managed lanes

Public Acceptance

The most difficult hurdle associated with tolling managed lanes on existing interstates is public resistance to tolling and a lack of knowledge regarding the benefits and costs of this approach. The public may resist this approach, believing interstates should be "free." Communities also may have concerns about the diversion of traffic to local municipal roadways. Recent tolling work on interstates (variable priced and other tolling methods) has included providing the managed lanes as additional capacity (lanes). Public acceptance for tolling managed lanes to include any value-pricing options will require an extensive outreach strategy to develop program acceptance.

Governance and Legislative Issues

Currently, only the Kansas Turnpike Authority (KTA) has the ability to collect fees associated with using a public road in Kansas. Should the KTA be merged with KDOT, then the application and collection of tolls would be subject to whatever legislation is adopted to combine those agencies. Additionally, the task force which developed the framework for the current T-WORKS transportation program (T-LINK) recommended tolling only for improved facilities. The T-LINK task force was silent on the issue of governance of possible future tolling efforts, but did indicate tolls collected on a facility should be used to construct or improve facilities within the region.

Governance issues for toll collection are one of several legislative considerations. A sampling of legislative actions from other states illustrate that a wide variety of both policy and statute changes may need to be pursued for managed lanes to be an effective tool in addressing congestion.

Table A-2. Potential legislative issues

Issue	Legislative Action
Authority to use tolls that vary in price	State
Ability to define lane usage during various periods of operation	State
Toll collection policies (including the use of electronic toll collection such as license plate recognition or optical scan)	State / KTA
Enforcement of managed lane usage	State, County, and Municipality
Collection policies for managed lane violations	State, County, and Municipality

In terms of federal requirements, KDOT would be required to coordinate with FHWA regarding any modifications to the lane usage along I-35 and the implementation of tolling. FHWA policies are evolving with regard to placing tolls on current facilities, when additional capacity is included. The current federal legislation, MAP-21, modified many of the policies in effect for placing tolls on current facilities, and while the climate may become more flexible in the future regarding tolling, more detailed analysis will be required at a time closer to actual implementation so that all applicable rules and regulations are followed – but with enough time so that authorizations can be secured without delaying implementation.

Regional Mobility Authorities are an emerging financing tool that allows politically created subdivisions to collect transportation funds for projects that improve regional mobility.

Regional Mobility Authorities

Regional Mobility Authorities (RMAs) are an emerging and innovative tool that enables politically created subdivisions to collect and invest transportation funds to improve regional mobility. Creation of a Regional Mobility Authority would require the State of Kansas to adopt legislation authorizing the establishment of an RMA. Funding for RMA's typically is generated through the collection of tolls as a primary source of revenue; however other revenue sources such as sales taxes or vehicle taxes/fees can be voted on, and if approved, collected by the RMA to fund projects. RMA's objectives are to increase resources for regional mobility projects and most often are prohibited from using existing funding sources. Additionally, projects implemented by an RMA can be for other modes beyond roadways, such as transit, passenger rail and airports.

Legislation

Legislation enacted by other states addressing the creation of RMAs has followed two distinctly different paths:

- RMAs are a political subdivision of the state and as a result a function of state government. Local governments must request through the state acceptance to establish the RMA. This form of RMA creation is used by the State of Texas.

- RMAs are a local political subdivision local government, most typically by county or multiple counties. The creation of the RMA is voted on by the region which is impacted. This form of RMA creation is used by the State of Arkansas.

Regardless of how RMA creation is authorized, the enabling legislation for RMA's will cover a host of administrative requirements such as the authority of the RMA to assess taxes or charge tolls, organizational formation, board development and by-laws. Legislation would also address project planning policies ranging from environmental reviews, development of plans, right-of-way acquisition and construction bidding.

RMAs and I-35

Specifically for I-35 or other existing KDOT owned facilities, legislation would need to consider how an RMA funded project is incorporated into improving and operating the facility. What responsibilities with operations, such as snow removal, would KDOT continue to perform and how would those expenses be reimbursed? How would project contract requirements developed? Could an RMA acquire property for planned improvements?

Should KDOT, the Legislature or local governments want to pursue the development of an RMA, more detailed analysis would be required so that legislation could be drafted that best fits the needs in Kansas.

Frontage Road Reclassification

Frontage road improvements to make signal and geometric modifications are recommended as part of the mid-term strategies. Frontage roads as currently classified by KDOT with MARC are not eligible for federal funding. Modifications to the functional classification would allow KDOT and local communities' access to other funding sources for making improvements. Modifying the functional classification would require eight to 12 months and consist of the following:

- KDOT, MARC, and affected local governments complete a technical analysis and recommend modifications to the current functional classification assignments (three to four months)
- FHWA review of the technical analysis and modifications of the functional classification assignments (two to four months)
- MARC staff recommendation to the Total Transportation Policy Committee and Committee Approval (one month)
- MARC staff submit committee approved changes to the MARC Board of Directors for their approval (two months)

This link addresses the technical process for completing the functional road reclassification and the review process.
www.marc.org/transportation/functional_class.htm

Public Engagement Plan

The public engagement plan below provides a road map or "menu" approach to public engagement whereby a more active approach is outlined in the "Inform and Seek Input" columns and a less active approach is outlined in the "Respond to Requests" columns **(Tables A-3, A-4 and A-5)**. The first approach allows KDOT to inform and seek additional input from stakeholders and the public early enough so input is meaningful and can be incorporated in implementation. The second approach is more focused on providing one-way communication to stakeholders and the public. The engagement plan outlines immediate quick start (zero – one year), mid term (two – five years) and long term (plus five years) strategies to address the overall study. Broad communication strategies are outlined for the five primary study recommendations:

- ITS;
- Transit;
- Shoulder running;
- Fixing bottlenecks; and
- Priced managed lanes.

Note – The years shown for the engagement plan are different than the years listed for the recommended improvements. As the corridor evolves and improvements are implemented, the engagement plan will need to address emerging messages and delivery methods. Longer term (beyond five years) engagement actions will greatly depend on communication methods employed in the first five years.

Table A-3.
Quick Start
Communications
Strategies

	Proactive – Inform and Seek Input	Respond to requests
Audiences	• I-35 Moving Forward Advisory Group • Local governments • Transportation Stakeholders including Chambers, Trucking Industry, Economic Development Councils, MARC Board • General Public • Media • Large Employers along I-35 • Large Traffic Generators (i.e. Inter-modal facility) • Legislators	• Local government • Transportation Stakeholders including Chambers, Trucking Industry, Economic Development Councils, MARC Board

Activities	• Actively seek opportunities to meet with groups/conferences to share results of study
	• Conduct Customer Satisfaction Survey to establish baseline of satisfaction along I-35 with the following key components:
	  • Address satisfaction across multiple areas to include congestion, maintenance, etc.
	  • Gather sufficient customer input to help set triggers for when improvements are needed
	• Seek briefings with local reporters
	• Seek opportunities to meet with large employers and traffic generators to address improvement opportunities and share study results particularly related to advance travel information
	• Actively engage all communities along I-35 to share results and gain support for key near-term corridor improvements
	• Present study and implementation strategies to MARC
		• Respond to requests for information

Supporting materials	• PowerPoint presentation on findings • Talking points for briefings (as part of a larger update) that KDOT staff/leadership could use • Fact sheet on findings • Video that explains study and has some info on what other states are doing • Bring MnDOT speaker back to address regional forum • Draft "article" or info piece for local publications to tailor as interested	• Talking points for briefings (use as part of a larger update) that KDOT staff/leadership could use • Fact sheet on findings

Table A-4.
Mid Term
(2-5 years)
Communications
Strategies

	Proactive – Inform and Seek Input	Respond to requests
Audiences	• I-35 Moving Forward Advisory Group • Local governments • Transportation Stakeholders including Chambers, Trucking Industry, Economic Development Councils, MARC Board • General Public • Media • Large Employers along I-35 • Large Traffic Generators (i.e. Inter-modal facility) • Legislators	• Local government • Transportation Stakeholders including Chambers, Trucking Industry, Economic Development Councils, MARC Board
Activities	• Plan local transportation leader tour of Minneapolis (suggested due to popularity of this example at National Experts Symposium) • Identify additional locations for subsequent tours and plan additional tours that are directly related to new activities being implemented • Bring in speakers from other areas which are using some of the improvement strategies to speak at a regional forum or advisory group • Consider creating a stakeholder advisory group to provide feedback on implementation. Advisory group formation should be timed to effectively message and gather feedback for strategy implementation • Actively engage communities along I-35 to share results and gain support for key near-term corridor improvements • Prepare yearly update briefing to MARC on study progress and results • Consider convening focus groups (depending on strategies to be implemented) • Actively seek opportunities to meet with groups/conferences to share results of study • Seek briefings with local reporters	• Respond to requests for information

	Proactive – Inform and Seek Input	Respond to requests
Supporting materials	• Update PowerPoint presentation regarding findings/ conditions and which issues may be approaching "trigger point(s)" • Update talking points for briefings (as part of a larger update) that KDOT staff/ leadership could use. Identify any changes in conditions on I-35 and which issues may be approaching "trigger point(s)" • Fact sheet /video regarding Minneapolis or other tour • Prepare annual "State of I-35" article addressing changes in conditions, improvements implemented and results. • Draft "article" or info piece for local publications to tailor as interested. (e.g., "As I See It" in KC Star).	• PowerPoint presentation on findings • Talking points for briefings (use as part of a larger update) that KDOT staff/leadership could use • Fact sheet on implementation activities

Table A-5. Long Term (5+ years) Communications Strategies

	Proactive – Inform and Seek Input	Respond to requests
Audiences	• I-35 Moving Forward Advisory Group • Local governments • Transportation Stakeholders including Chambers, Trucking Industry, Economic Development Councils, MARC Board • General Public • Media • Large Employers along I-35 • Large Traffic Generators (i.e. Inter-modal facility) • Legislators	• Local government • Transportation Stakeholders including Chambers, Trucking Industry, Economic Development Councils, MARC Board
Activities	• Actively seek opportunities to meet with groups/conferences to share results of study • Seek briefings with local reporters to relate progress and results of previous actions • Actively engage communities along I-35 to share results and gain support for the next anticipated strategy to be implemented along I-35 • Prepare yearly update briefing to MARC on study progress and results • Consider creating a stakeholder advisory group to provide feedback on implementation. Advisory group formation should be timed to effectively message and gather feedback for strategy implementation	• Respond to requests for information
Supporting materials	• Update PowerPoint presentation regarding findings/ conditions and which issues may be approaching "trigger point(s)" • Update talking points for briefings (as part of a larger update) that KDOT staff/ leadership could use. Identify any changes in conditions on I-35 and which issues may be approaching "trigger point(s)" • Fact sheet /video regarding tours of what other areas are doing to address congestion • Prepare annual "State of I-35" article addressing changes in conditions, improvements implemented and results. • Draft "article" or info piece for local publications to tailor as interested	• PowerPoint presentation on findings • Talking points for briefings (use as part of a larger update) that KDOT staff/leadership could use • Fact sheet on implementation activities

Broad Communication Strategies for Recommended Improvement Categories

ITS

Ramp Metering

- Message: Don't rush into a traffic jam and make it worse. Ramp metering provides smoother flow, faster travel effectively at a low cost.
  - Refresh and update the successful campaign developed by KC Scout for ramp metering on I-435 to reflect implementation along I-35.
  - Targeted briefings to local governments along the I-35 corridor to address concerns about system backups on arterial routes.
  - Use KDOT social media tools to promote ramp metering along I-35.
  - Using email database to target Kansas City area stakeholders, large employers, and large traffic generators along I-35 and distribute electronic brochures for their use.

Advance Traveler Information

- Message: Knowledge is power; trip planning before you leave the door.
  - Promote the planned release of the "My Scout" application for I-Phone and Android anticipated in spring 2013.
    - Use KDOT social media tools to promote the application release.
    - Press release announcing the new application.
    - Using email database to target Kansas City area stakeholders, large employers, and large traffic generators along I-35 and distribute electronic brochures for their use.
  - Promote the planned update to the "My Scout" e-mail alert system that is anticipated to be implemented in fall 2013.

Motorist Assist Program

- Message: A helping hand speeds traffic along.
  - Press release and press event.
  - Billboards on corridor to announce enhanced efforts.
  - KDOT and KHP use social media to promote enhanced efforts.
  - Use email database to target Kansas City area stakeholders on effectiveness of Motorist Assist.
  - Add signage along I-35 announcing that it is a Motor Assist Route.
  - Promote Motorist Assist Program on Dynamic Message Boards.

Transit

Bus on Shoulder

- Message: Move more people during periods of high congestion.
  - Refresh and update the successful campaign developed by Johnson County Transit current Bus on Shoulder program as it expands to other locations along I-35.
  - Add information about Bus on Shoulder to the KDOT website covering basics such as rules on operation, bus driver instructions, and ramp usage. See www.dot.state.mn.us/metro/teamtransit/ for example on how Minnesota illustrates Bus on Shoulder information or www.triangletransit.org/boss for example of Bus on Shoulder in North Carolina.

Shoulder Running`

- Message: Use every bit of I-35 to safely improve the flow of goods and people
  - Create focused multi-media marketing campaign to address shoulder running.
    - Billboards on corridor to announce shoulder running is coming.
    - KDOT focus in coordination with KHP to use social media to address safe operations and rules for using shoulders.
    - Use email database to target Kansas City area stakeholders.
    - Actively engage media on shoulder running plan.
    - Actively engage communities along I-35 on shoulder running.
    - Develop targeted outreach to motor carriers.

    (Note – shoulder running is a transition to price managed lanes and a large focus from the media and public will be eventual tolling. Specific and significant element of the messaging and marketing efforts will need to address future pricing and lane management.)

Fix Bottlenecks

- Message: I-35 works better when bottlenecks are fixed.
  - Engagement strategy focuses on the issues and impacts of the bottlenecks. Specific solutions and resulting projects can be linked to overall corridor improvement plan, but should also have unique and dedicated communication and engagement strategies.
  - Create fact sheet on each specific bottleneck identified in the I-35 study.
  - Engage communities along I-35 and MARC annually to address issues specific to bottlenecks along corridor.
  - Draft “article” or info piece for local publications tailored to each identified bottleneck and underlying need.

Priced Managed Lanes

- Message: It's not about the money, it's about creating ways for traffic to flow more reliably and smoothly.
  - Create focused multi-media marketing campaign solely to address priced managed lanes.
    - Identify three or four local champions to lead the local outreach efforts
    - Use focus groups to test messaging and marketing approaches.
    - Form an advisory group of elected officials and other key stakeholders well in advance.
    - An engagement plan that is centered on education to aid in understanding how price managed lanes aid in congestion relief and promote reliable travel.
- Add information about Price Managed Lanes to the KDOT website. See www.udot.utah.gov/expresslanes/ for an example on addressing express lanes and messages on price managed lanes.

Performance Monitoring Plan

Understanding the I-35 performance trends over time will provide the most comprehensive picture of the I-35 Corridor. This plan has documented the current conditions and forecasted future conditions. The Performance Monitoring Plan develops an approach to monitor the performance of the I-35 Corridor on a regular basis.

I-35 performance trends over time will provide the most comprehensive picture of the I-35 Corridor.

The recently-passed federal transportation reauthorization bill, Moving Ahead for Progress in the 21st Century (MAP-21) features a new federal emphasis on performance measurement. As part of MAP-21, states, coordinating with metropolitan planning organization, will be required to establish targets that reflect the measures established by the U.S. DOT.

MARC currently monitors performance measures on an annual basis at a regional level. The following two reports represent MARC's current annual performance monitoring:

- *Transportation Outlook 2040, Performance Measures Progress Report*
- *Congestion Management Process, an Assessment of Congestion in the Kansas City Region Using the MARC Travel Demand Model*

These two MARC reports measure performance from a regional standpoint on an annual basis. These reports do a good job of understanding how the regional network is performing at a high level, in a given year. However, these reports often do not have the level detail necessary for a comprehensive understanding of a specific corridor and do not show specific corridor trends from year to year.

The I-35 Vision statement strives to advance regional transportation goals for the I-35 corridor. MARC used the Transportation Outlook 2040 plan regional goals to help select transportation projects to be funded in the future. Below is a list of MARC's regional goals which are consistent with the I-35 Corridors goals.

- **Accessibility** - Maximize mobility and access to opportunity for all area residents.
- **Climate Change & Energy Use** - Decrease the use of fossil fuels through reduced travel demand, technology advancements and a transition to renewable energy sources.
- **Economic Vitality** - Support an innovative, competitive 21st Century economy.
- **Environment** - Protect and restore our region's natural resources (land, water and air) through proactive environmental stewardship.
- **Place Making** - Coordinate transportation and land-use planning as a means to create quality places in existing and developing areas, and to strengthen the quality of the region.
- **Public Health** - Facilitate healthy, active living.
- **Safety and Security** - Improve safety and security for all transportation users.
- **System Condition** - Ensure transportation system is maintained in good condition.
- **System Performance** - Manage the system to achieve reliable and efficient performance.

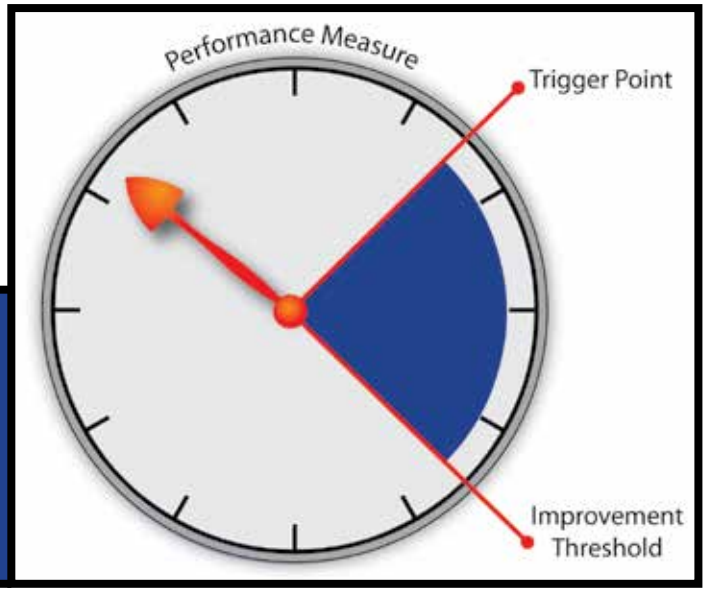

Figure A-2. Performance Measure

In addition to MARC's current performance monitoring and the MAP-21 legislation for more system performance monitoring, an I-35 performance monitoring plan is recommended. The I-35 performance monitoring plan will identify trigger points and improvement thresholds when I-35 improvements are needed in the corridor, similar to what is shown in **Figure A-2.**

The I-35 Performance Monitoring Plan is described with the following goal, objectives and process. More detail will be needed once the monitoring plan is established; the following section provides the framework for the plan.

I-35 Performance Monitoring Plan

Goal: Understand the I-35 corridor performance trends over time.

Objective: Utilize MARC's *Transportation Outlook 2040 Performance Measures Progress Report, Congestion Management Process Assessment* and *I-35 Performance Monitoring Plan* to evaluate the I-35 Corridor and determine when recommended improvements are needed.

Process: Convene an I-35 Moving Forward Committee to discuss changes to the I-35 vision, guiding principles and corridor optimization. The I-35 Moving Forward Committee would be comprised of representatives from KDOT, MARC, FHWA and communities adjacent to the I-35 corridor. The committee would meet annually to discuss the vision, guiding principles and changes along the corridor. The committee would review MARC's *Transportation Outlook 2040, Performance Measures Progress Report* and *Congestion Management Process, an Assessment of Congestion in the Kansas City Region using the MARC Travel Demand Model Report*. Every three years the committee would review the *I-35 Moving Forward Monitoring Plan.*

The *I-35 Monitoring Plan* would be made up of specific performance triggers tied to the I-35 corridor. The I-35 performance triggers would be tied to current and future federal performance monitoring requirements. **Table A-6** (next page) provides suggested performance triggers, however, these could change over time. The measurement of the performance of the corridor would need to be accomplished by a team of stakeholders made up of state, regional and local partners.

The I-35 Study Corridor is one of the most important transportation corridors in the Kansas City region and state. However, for efficiency, KDOT may want to combine a corridor-level performance monitoring plan into multiple high importance corridors in the Kansas City region. If so, KDOT should consider grouping K-10/I-435, U.S. 69 and I-35 into one performance monitoring plan.

Table A-6.
I-35 Performance Triggers

Performance Factors		How it is Measured	Goal	Planning Trigger	Design/ Implementation Trigger
Map 21	I-35 Corridor				
System Reliability	Traffic Flow	Average speeds	LOS D Speed	< 50 mph (LOS E/F)	< 40 mph (LOS F)
		Travel Time	LOS D Travel Time	< 50 mph (LOS E/F)	< 40 mph (LOS F)
Congestion Reduction		Duration of congestion (LOS E or F) during the day	<1 hour/ weekday	Sustained 2hrs/weekday	Sustained 3hrs/weekday
		Average time to clear traffic incident	35 min.	45 Minutes	60 Minutes
		Interchange Delay	70 sec. (mid LOS D) - 2 int.	85 sec. (LOS D/E) - 2 int.	120 sec. (LOS E/F) - 2 int.
	Local Traffic Flow	Arterial delay	LOS D	40% FFS, LOS E annually	30% FFS, LOS F
Infrastructure Condition	Smooth and Unrestricted Roads and Bridges	Highway pavement condition (PL-1 Best to PL-3 Worst)	85% Good Condition	< 75% Good Condition (PL-1)	< 65% Good Condition (PL-1)
		Bridge condition (0 to 9)	Average 6 Rating	Average Condition Rating Below 5	Average Condition Rating Below 4
Safety	Safe Transportation System	Number of fatalities and disabling injuries (K + A)	Reduce by 2% annually	1% Increase Annually (3 yr. avg.)	3% Increase Annually (3 yr. avg.)
		Crash Rate	Statewide Average	1 - 1.5 of Statewide Average	> 1.5 of Statewide Average
		Number of commercial vehicle fatalities	Reduce by 2% annually	1% Increase Annually (3 yr. avg.)	3% Increase Annually (3 yr. avg.)
	Customer Service	Percent of customer satisfaction	75% Satisfaction	70% Customer Satisfaction	65% Customer Satisfaction
		Percent of customers satisfied with transportation options	75% Satisfaction	70% Customer Satisfaction	65% Customer Satisfaction
		Percent of customers satisfied with non-motorized options	75% Satisfaction	70% Customer Satisfaction	65% Customer Satisfaction
Environmental Sustainability	Easily Accessible Mode Choice	Number of Transit Passengers	Significant Increase	30% Increase	45% Increase
		Transit Ridership per mile per hour of service	Significant Increase	30% Increase	45% Increase
		Utilization of existing P&R lots	Increasing Trend	65% Full	80% Full

Performance Factors		How it is Measured	Goal	Planning Trigger	Design/ Implementation Trigger
Map 21	I-35 Corridor				
Freight Movement & Economic Vitality	Efficient Movement of Goods	Percent trucks	< 25%	25% - 35%	> 35%
		Performance	LOS D (All vehicles)	< 50 mph (LOS E/F)	< 40 mph (LOS F)
	Economic Impact	Change in economic activity	Increasing Trend	5% increase in employees	10% increase in employees

Next Steps

The I-35 Corridor Optimization study developed short-term, mid-term and long-term recommended improvements for the I-35 Corridor in Johnson and Wyandotte Counties. In order to keep the I-35 momentum "Moving Forward," the study surveyed the Advisory Group to identify and prioritize a list of cost-effective priority next step projects based on the near-term recommendations (2013-2020).

An initial list of 15 possible next step projects including both projects where further study is needed and implementable projects in the corridor were identified. Advisory Group members were asked to place a 1 (high priority), 2 (medium priority) or 3 (low priority) for each of the 15 projects. They were also given the opportunity to add any project not identified on the original list of 15. The initial survey results were discussed at the final Advisory Group meeting on April 1, 2013 with the entire study team.

Based on further discussion with KDOT leadership, **Table A-7** (next page) represents the final recommended next steps moving forward.

Table A-7.
I-35 Next Steps Moving Froward

#	Improvement Area	Priority
ITS		
1	Ramp Metering Implementation	
2	Advanced Traveler Information Public Awareness Campaign	
3	Enhanced Traffic Incident Management Plan	
4	Arterial Dynamic Message Signs Plan	
Multi-Modal		
5	Expand Johnson County Transit Bus on Shoulder	
Shoulder Running		
6	Shoulder Running Plan	
Fix Bottlenecks		
7	Preliminary Engineering for mainline through 75th Street	
8	Add a continuous auxiliary lane from SB Mission on-ramp to 18th St. Expressway off-ramp	
9	Detailed geometrics study of proposed improvements (Plan Plates)	
Managed Lanes		
10	Feasibility Study (Traffic and Revenue)	
Policy, Governance and Legislative Plan		
11	Develop Shoulder and Managed Lane Governance Plan	
Funding and Financing Plan		
12	Develop local partnership funding next steps	
Public Engagement Plan		
13	Messaging the I-35 Plan to other stakeholders (community leaders, legislators, etc.)	
Performance Monitoring		
14	Conduct motorist survey to determine baseline satisfaction with current I-35 conditions	
15	Establish Performance Monitoring Program for I-35	