South Lawrence Trafficway Supplemental EIS
Preliminary Purpose and Need Statement

A Purpose and Need Statement describes the transportation problems that a proposed project is to address. This statement provides a description of the purpose of the K-10 Highway South Lawrence Trafficway (SLT) project, and a demonstration of the need for improvements the proposed project is to address within the study area.

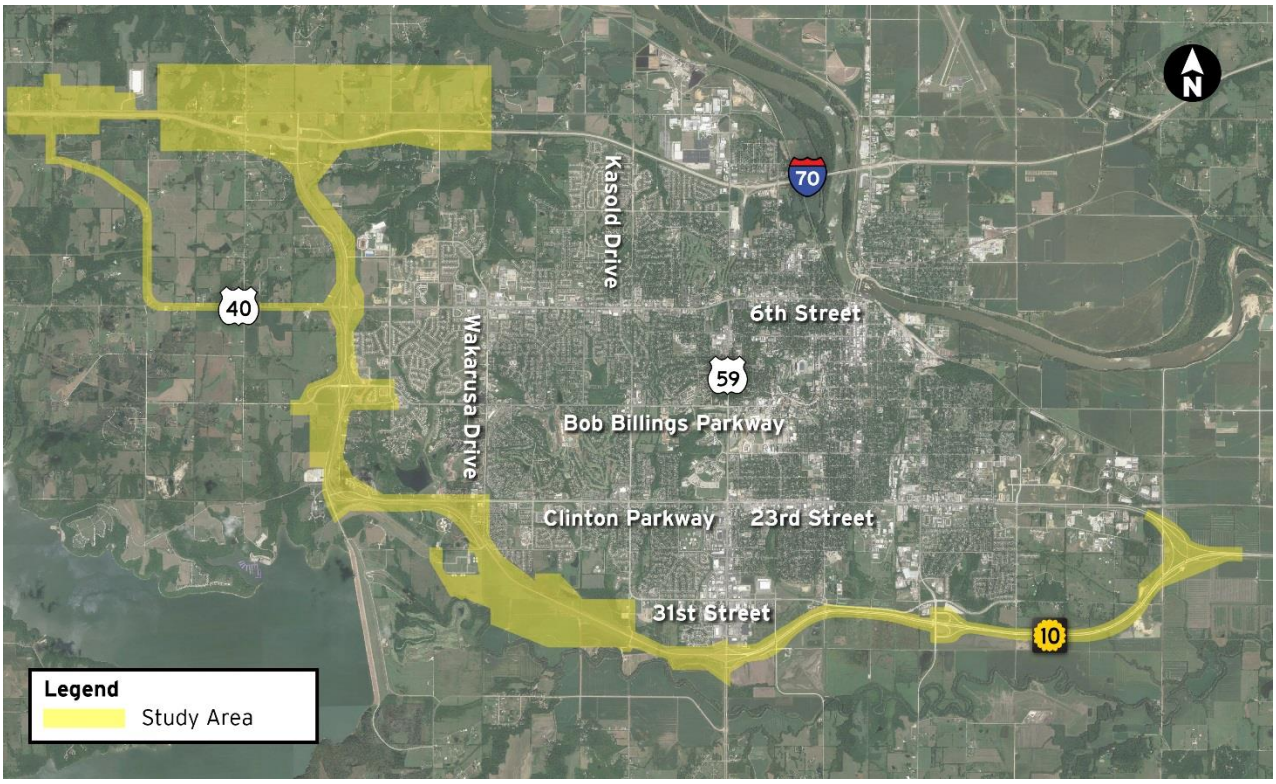
A. Project Overview and Background

The Kansas Department of Transportation (KDOT) and the Federal Highway Administration (FHWA) are proposing to upgrade and widen a section of the SLT, located within the south and west limits of the city of Lawrence, in Douglas County, Kansas.

1. Project Limits and Termini

Figure 1 shows the study area for the project. The study area boundaries represent the logical limits for the infrastructure improvements and environmental review. The overall project study limits begin just north of Interstate 70 at North 1800 Road/Farmer's Turnpike and extend to just east of the existing K-10/23rd Street system interchange.

Figure 1: South Lawrence Trafficway Project Study Area



The overall length is 19.0 miles and is subdivided into sections as follows:

- The West Section begins just north of Interstate 70 at North 1800 Road/Farmer's Turnpike and continues to US-59/Iowa Street (approximately 8.7 miles);
- The East Section begins at US-59/Iowa Street and continues to the existing K-10/23rd Street system interchange (approximately 6.3 miles); and
- The project study area also includes East 600 Road/Lecompton Road at Interstate 70 (approximately 0.6 mile), and U.S. 40 from K-10 to E 600 Road (approximately 4.1 miles).

2. Project Background

The National Environmental Policy Act (NEPA) requires the FHWA to assess the environmental effects of projects that include federal funding or require a federal action. The NEPA process allows transportation officials to make project decisions that balance engineering and transportation needs with social, economic, and natural environmental factors. An Environmental Impact Statement (EIS) is prepared for projects where the action is expected to have significant effect on the man-made and natural environment.

A previous EIS was prepared in 1990 for the overall SLT study area. The Purpose and Need stated in that EIS was to relieve congestion on existing 23rd Street/Clinton Parkway and Iowa Street by diverting through and local traffic from these two existing streets, thereby achieving an improved level of service on the local street network. As an outcome of the approved 1990 EIS, two expressway lanes of the West Section were constructed and opened to traffic in 1996. The East Section was not constructed and a subsequent SEIS with a "No Build" decision was approved in 2000. A subsequent EIS, in conjunction with a USACE 404 Permit, was completed in 2002 and adopted and approved by FHWA in November 2007. The FHWA then issued a Record of Decision (ROD) in May 2008. Since the completion of the ROD, the East Section four-lane freeway was constructed and opened to traffic in 2016.

The *K-10 West Leg Concept Study*, conducted from 2014-2016 for the Kansas Department of Transportation, investigated the current and future needs and functions in the K-10/SLT West Section. This study considered alternatives for the future widening and upgrade of the corridor, which modified the current 2-lane expressway design to a 4-lane freeway design (accommodating a future widening to a 6-lane section, if warranted) with limited access, and grade separated interchanges in place of existing at-grade intersections. The concept study will be used as a reference document during the preparation of the SEIS.

3. Proposed Action

A Supplemental Environmental Impact Statement (SEIS) will be prepared for the proposed SLT project. A SEIS reviews the findings of an existing EIS and considers new or additional environmental impacts based on the introduction of new improvement options and/or major changes in the natural environment or communities. To comply with NEPA, the SEIS evaluates viable alternatives developed to satisfy the purpose and need of the proposed project.

The current SEIS, as a supplement to the original 1990 EIS, will evaluate a 'No Action' alternative as well as a combination of potential funding options for the build alternatives for the entire SLT study area. Roadway configuration options will be evaluated, including upgrading of the West Section as a freeway with either four or six lanes, as predicated on future need, with controlled access. Access modifications would also be evaluated at existing and potentially relocated access points along the SLT West Section and at I-70/East 600 Road/Lecompton Road and K-10/I-70/North 1800 Road.

The East Section of the SLT is included in this study because it was a part of the study area for the original 1990 EIS, and because funding options, such as tolled and toll-free options, are being evaluated for the project. Therefore, the entire SLT corridor will need to be evaluated to assess potential impacts of the funding options. It is not anticipated that there will be any physical roadway improvements or modifications that require additional right-of-way on the East Section as a result of the funding options.

B. Purpose and Need

1. Need for Proposed Project

The proposed project is needed because the capacity of the SLT West Section has become insufficient to meet current and future traffic volumes, resulting in increased congestion and safety issues now that the facility connects to a four-lane freeway with controlled access on the East Section. Additionally, a continuous highway connection now exists between K-10 Highway in the Kansas City metro area and I-70 and has attracted a significant amount of regional traffic to the SLT corridor.

The proposed project is needed to:

- ***Reduce congestion*** and improve the traffic capacity to meet existing and future travel demands,
- ***Enhance safety*** to help address high crash locations within the study area,
- ***Promote a multimodal transportation system*** by ensuring the project accommodates the needs of other transportation modes, and
- ***Support local and regional growth*** by providing and coordinating transportation connections to be consistent with planned and proposed community land use and development.

2. Purpose of Proposed Project

The purpose of the South Lawrence Trafficway is to provide the traveling public with an efficient and cost-effective transportation facility for users of K-10 Highway and the connected state highway system that reduces congestion, enhances safety, promotes a multimodal transportation system and supports local and regional growth. In addition, the purpose and need established in the 1990 EIS will be carried forward for the SEIS, which is to relieve congestion on the local street network within the city of Lawrence.

The proposed project is consistent with the identified needs and goals of KDOT's Kansas Long-Range Transportation Plan and the Lawrence-Douglas County Metropolitan Planning Organization, as outlined in the *Transportation 2040 Lawrence-Douglas County Metropolitan Transportation Plan* (2018 version).

3. Reduce Congestion

It is an important goal of the proposed project to help alleviate anticipated congestion levels in the Lawrence area of Douglas County and to provide a more efficient SLT corridor for the surrounding region. Relieving congestion on the major arterials of 23rd Street/Clinton Parkway and Iowa Street in the city of Lawrence has been a primary focus of the development of the SLT corridor since the initial 1990 EIS. The initial EIS sought to address congestion on these major arterials by constructing a four-lane expressway and diverting traffic to the SLT, thereby achieving improved travel conditions on the local street network. The expressway alternative evaluated in this study had both at-grade intersections and grade-separated interchanges to provide access in the Lawrence area. As an outcome of the 1990 EIS, two expressway lanes of the West Section were approved, constructed and opened to traffic in 1996. At this time, the East Section was not constructed and a subsequent SEIS with a "No Action" decision was approved in 2000.

Relieving congestion and the need to divert local and regional through traffic from 23rd Street/Clinton Parkway and Iowa Street continued as an important component of the purpose and need in the subsequent 2002 EIS, which is the document that ultimately led to approval to construct the East Section as a four-lane freeway. The freeway alternative approved in this study provides four travel lanes with limited access provided through grade-separated interchanges.

a. Existing Traffic Conditions

SLT Corridor Congestion

While the opening of the SLT East Section met its intended purpose of relieving congestion along 23rd Street/Clinton Parkway and Iowa Street, it also resulted in the need to evaluate traffic capacity improvements on the SLT West Section. The opening of the East Section as a four-lane freeway in 2016 has contributed to the need to build the additional two lanes of traffic capacity on the West Section as both local and regional through traffic has shifted to the SLT. Additionally, a continuous highway connection now exists between K-10 Highway in the Kansas City metro area and I-70 and has attracted a significant amount of regional traffic to the SLT corridor.

Table 1 shows the traffic volumes on the SLT corridor before and after the opening of the SLT East Section. The table shows that traffic volumes have more than doubled on the southern portion of the West Section and nearly doubled on the northern portion once the East Section was open to traffic.

The study team completed a Level of Service (LOS) analysis of roadway capacity and operations along the SLT corridor and at connecting intersections to assess levels of congestion. Traffic planners and engineers use LOS as a qualitative measure to characterize operational conditions and traveler perception of ease of travel. Traffic conditions are graded on a scale of LOS A through F. LOS A is the most favorable driving condition, LOS D or better is considered acceptable by KDOT during peak travel times in urban settings, and LOS E or F represents unacceptable traffic operations.

Table 1: 2045 No Action Forecasted Volumes for SLT Corridor Mainline (Two-Way ADT)

Highway Segments		Pre-East Section 2014 ADT	Post-East Section 2018 ADT
From	To		
SLT @ Iowa St	SLT @ Kasold Dr	7,150	19,300
SLT @ Kasold Dr	SLT @ 27th St	6,660	19,550
SLT @ 27th St	SLT @ Clinton Pkwy	6,000*	14,800
SLT @ Clinton Pkwy	SLT @ Bob Billings		17,100
SLT @ Bob Billings	SLT @ W 6th St	9,790	18,600
SLT @ W 6th St	SLT @ I-70	11,800	18,800

*In 2014, Bob Billings Interchange was not yet open to traffic.

Table 2 shows the change in SLT corridor congestion before and after the opening of the SLT East Section. Prior to the opening of the East Section, the two-lane expressway on the West Section operated with acceptable level of service (LOS) to the south of Clinton Pkwy. However, after the opening of the East Section, the West Section has become increasingly congested throughout the entire corridor since it remains as a two-lane expressway with at-grade intersections connecting to a four-lane freeway at I-70 and K-10.

Table 2: Level of Service for SLT Corridor and Intersections Before and After Opening of East Section

Highway Segments		2014 Pre-East Section AM LOS	2018 Post East Section AM LOS	2014 Pre-East Section PM LOS	2018 Post-East Section PM LOS
From	To				
SLT @ Iowa St	SLT @ Kasold Dr	D	**E***	D	**E***
SLT @ Kasold Dr	SLT @ 27th St	D	**E***	D	**E***
SLT and 27th Street/Wakarusa Intersections		B	**F***	B	**F***
SLT @ 27th St	SLT @ Clinton Pkwy	D	**E***	D	**E***
SLT @ Clinton Pkwy	SLT @ Bob Billings	**E****	**E***	**E****	**E***
SLT @ Bob Billings	SLT @ W 6th St		**E***		**E***
SLT @ W 6th St	SLT @ I-70	**E***	**E***	**E***	**E***
SLT and EB I-70 Intersection		A	A	C	B
SLT and WB I-70 Intersection		A	A	A	A

* **Bold indicates LOS E or worse operating conditions.**

**In 2014, Bob Billings Interchange was not yet open to traffic.

Two separate travel time studies were conducted to analyze the impact of the opening of the East Section on the AM and PM peak periods. The first study was conducted in 2014 before the opening of the East Section and the other in 2018 after the opening of the East Section. **Table 3** shows the results of the impact the opening of the East Section had on corridor travel times.

The travel time study results show that 3 of the 8 segments experienced increases in travel time of approximately 50 seconds or more during both the AM and PM peak periods after the East Section opened to traffic. The area of greatest increase in travel times was from I-70 at Kasold Drive to W 6th Street on SLT with 132 seconds (2.2 minutes) in the AM and 162 seconds (2.7 minutes) in the PM. This was followed by the segment along SLT from Iowa Street to Clinton Parkway at 62 seconds in the AM and 89 seconds in the PM. Travel time increases of this magnitude indicate a worsening in congestion within portions of the SLT corridor now that the East Section is open to traffic. Travel time improves slightly southbound and is virtually the same northbound between 6th St and Clinton Pkwy due to the removal of the 1500 Rd intersection and the addition of the Bob Billings interchange that increased the capacity of that segment as volumes have increased.

Table 3: Travel Time (in Seconds) Before and After Opening of the SLT East Section

Highway Segments		AM 2014	AM 2018	AM Difference	PM 2014	PM 2018	PM Difference
From	To						
SLT @ Iowa St	SLT @ Clinton Pkwy	257	319	62	243	332	89
SLT @ Clinton Pkwy	SLT @ W 6th St	112	114	2	111	109	-2
SLT @ W 6th St	SLT @ N 1800 Road	139	188	49	140	175	35
SLT @ W 6th St	I-70 @ Kasold Dr	309	334	25	319	322	3
I-70 @ Kasold Dr	SLT @ W 6th St	325	457	132	327	489	162
SLT @ N 1800 Road	SLT @ W 6th St	130	139	9	132	135	3
SLT @ W 6th St	SLT @ Clinton Pkwy	113	107	-6	111	110	-1
SLT @ Clinton Pkwy	SLT @ Iowa St	254	277	23	251	301	50

As part of the travel time studies, the average speed was determined for segments of the SLT. **Table 4** shows the impact the opening of the East Section had on average travel speeds.

Table 4: Travel Speeds (in Miles Per Hour) Before and After Opening of the East Section

Highway Segments		AM 2014	AM 2018	AM Difference	PM 2014	PM 2018	PM Difference
From	To						
SLT @ Iowa St	SLT @ Clinton Pkwy	60	53	-7	63	51	-12
SLT @ Clinton Pkwy	SLT @ W 6th St	63	63	0	63	66	3
SLT @ W 6th St	SLT @ N 1800 Road	56	29	-27	55	47	-8
SLT @ W 6th St	I-70 @ Kasold Dr	65	61	-4	62	64	2
I-70 @ Kasold Dr	SLT @ W 6th St	61	43	-18	61	42	-19
SLT @ N 1800 Road	SLT @ W 6th St	59	55	-4	58	56	-2
SLT @ W 6th St	SLT @ Clinton Pkwy	62	67	5	63	66	3
SLT @ Clinton Pkwy	SLT @ Iowa St	60	61	1	61	56	-5

Overall, the average speeds on the SLT corridor trend down after the opening of the East Section. In the AM peak, with 5 of the 8 segments seeing a decrease in speed, 2 of the 8 segments decrease by over 15 mph. During the PM peak, 5 of the 8 segments see an overall decrease in speed, with 2 of the 8 segments decreasing by more than 10 mph. Several areas have been improved since 2014 including the conversion of Kasold Dr to a right-in-right-out (which has now been subsequently closed in late 2018)

and the replacement of the North 1500 Rd at-grade intersection with the Bob Billings interchange. Due to these improvements, travel speeds have increased slightly along these segments.

In summary, the increase in travel times and reduction in average speeds after the opening of the East Section demonstrate an increase in traffic congestion on the West Section after the East Section opened to traffic in 2016. This condition is expected to continue to worsen as traffic continues to shift from Lawrence area arterials to the SLT, and the SLT corridor continues to attract increased regional traffic between K-10 Highway in the Kansas City metro area and I-70.

Local Arterials Congestion

Relieving congestion on the major arterials in the city of Lawrence continues to be a primary focus of the improvements to the SLT corridor. Major arterials are defined by the federal functional classification map, last approved August 1, 2017 by FHWA. **Table 5** shows a comparison of the Volume-to-Capacity (V/C) Ratio for select intersections within the SLT study area before and after the opening of the SLT East Section. A V/C Ratio depicts the degree of saturation an intersection experiences during typical conditions, which is a measure of an intersection's ability to accommodate traffic demand. The FHWA considers a V/C Ratio of 0.85 or lower to indicate adequate capacity. As the V/C Ratio approaches 1, the ability of the intersection to handle traffic demand without queuing and delays diminishes. A V/C Ratio above 1 indicates excessive queuing and delay.

Table 5: Arterial Intersections V/C Ratio Before and After Opening of the SLT East Section

Intersection	2014 Pre-East Section AM V/C	2018 Post-East Section AM V/C	2014 Pre-East Section PM V/C	2018 Post-East Section PM V/C
N 1800 Rd & E 1200 Rd	0.22	0.21	0.20	0.23
W 6th St & Wakarusa Dr	0.37	0.47	0.65	0.53
W 6th St & Kasold Dr	0.64	0.72	0.77	0.80
W 6th St & Iowa St	**1.01***	0.82	**0.97***	**0.91***
Bob Billings Pkwy & Iowa St	0.55	0.70	0.68	0.77
Clinton Pkwy & Wakarusa Dr	0.61	0.61	0.73	0.73
Clinton Pkwy & Kasold Dr	0.58	0.50	0.82	0.82
Clinton Pkwy & Iowa St	0.59	0.58	**0.91***	0.67
W 23rd St & Massachusetts St	**0.86***	0.82	**2.22***	**1.13***
E 23rd St & Haskell Ave	0.70	0.74	**0.96***	0.67
E 23rd St & O'Connell Rd	0.71	0.59	**1.02***	0.60
Iowa St & W 31st St	0.32	0.43	0.48	0.64
Iowa St & W 33rd St	0.26	0.32	0.54	0.54
Kasold Dr & W 31st St	0.33	0.40	0.67	**1.00***

***Bold** indicates at or over 0.85 threshold.

As **Table 5** shows, after the opening of the East Section, the V/C Ratio at all intersections on local arterials that were above the 0.85 threshold improved. The only two intersections that remained operating above the V/C Ratio threshold of 0.85 after the opening of the East Section were W 6th St and Iowa as well as the W 23rd St and Massachusetts St intersection. All other intersections that were previously above the 0.85 V/C Ratio threshold were now below that threshold after the opening of the East Section. The 31st St and Kasold Dr intersection was shown to be slightly worse after the East Section opened as traffic shifted in order to avoid the congestion at the intersection of SLT and 27th St, especially in the PM peak hour. The most significant improvements to local intersections occurred on 23rd Street east of Iowa St, indicating that traffic shifted to the SLT East Section once it was opened to traffic, thereby relieving congestion on local Lawrence arterials.

If no improvements to the SLT West Section are made in the future, the improvements experienced at the principal and major arterials in Lawrence could start to degrade as traffic congestion grows on the unimproved 2-lane expressway.

b. Future Traffic Conditions

Table 6 illustrates how traffic volumes have increased with the opening of the East Section of the SLT and how they are projected to further increase by the design year 2045 without improvements to the SLT West Section, known as a "No Action" condition.

Table 6: 2045 No Action Forecasted Volumes for SLT Corridor Mainline (Two-Way ADT)

Highway Segments		Pre-East Section 2014 ADT	Post-East Section 2018 ADT	No Action Forecasted 2045 ADT
From	To			
SLT @ Iowa St	SLT @ Kasold Dr	7,150	19,300	29,200
SLT @ Kasold Dr	SLT @ 27th St	6,660	19,550	28,700
SLT @ 27th St	SLT @ Clinton Pkwy	6,000*	14,800	25,000
SLT @ Clinton Pkwy	SLT @ Bob Billings		17,100	26,800
SLT @ Bob Billings	SLT @ W 6th St	9,790	18,600	27,800
SLT @ W 6th St	SLT @ I-70	11,800	18,800	25,800

*In 2014, Bob Billings Interchange was not yet open to traffic.

As can be seen in **Table 6**, the largest percentage increase in traffic volumes after the opening of the East Section was in the southern section of the corridor. This pattern of growth is expected to continue, resulting in the highest volumes in the 2045 No Action condition being in the section to the west of US-59/Iowa St.

<u>SLT Corridor Congestion</u>

Table 7 shows the LOS operating conditions for the future No Action peak periods (AM and PM) for the SLT West Section. The table shows that the expected increase in traffic volumes by 2045 will result in a

significant increase in congestion along the SLT West Section. Unacceptable operating conditions of LOS E or F are forecasted to occur along all the mainline segments in both peak periods, in addition to the SLT/EB I-70 intersection in the PM peak period and the SLT/27th St/Wakarusa intersections in both peak periods.

Table 7: 2045 No Action Forecasted Level of Service for SLT Corridor and Intersections

Highway Segments		No Action 2045 AM LOS	No Action 2045 PM LOS
From	To		
SLT @ Iowa St	SLT @ Kasold Dr	**F***	**F***
SLT @ Kasold Dr	SLT @ 27th St	**F***	**F***
SLT and 27th Street/Wakarusa Intersections		**F***	**F***
SLT @ 27th St	SLT @ Clinton Pkwy	**E***	**E***
SLT @ Clinton Pkwy	SLT @ Bob Billings	**F***	**F***
SLT @ Bob Billings	SLT @ W 6th St	**F***	**F***
SLT @ W 6th St	SLT @ I-70	**F***	**F***
SLT and EB I-70 Intersection		D	**E***
SLT and WB I-70 Intersection		C	D

* **Bold indicates LOS E or worse operating conditions.**

Local Arterials Congestion

Table 8 displays the expected increase in traffic along Lawrence local arterials by 2045 due to the lack of capacity to serve traffic along the SLT West Section as a two-lane expressway in the future. As shown in **Table 8**, several intersections, including those located along Iowa St, Kasold Dr, and

23rd St / Clinton Parkway will operate significantly worse by 2045 than in 2018. The worst operating intersection prior to the East Section opening at W 23rd St and Massachusetts St will return to over-capacity conditions by the 2045 No Action condition without the improvement of the SLT West Section. This means that alleviated congestion on local Lawrence arterials experienced after the East Section opened to traffic could degrade if no improvements are made to the SLT West Section in the future.

Table 8: 2045 No Action Arterial Intersections Volume to Capacity (V/C) Ratio

Intersection	2014 Pre-East Section AM	2014 Pre-East Section PM	2018 Post East Section AM	2018 Post East Section PM	No Action 2045 AM V/C	No Action 2045 PM V/C
N 1800 Rd & E 1200 Rd	0.22	0.20	0.21	0.23	0.38	0.32
W 6th St & Wakarusa Dr	0.37	0.65	0.47	0.53	0.69	0.76
W 6th St & Kasold Dr	0.64	0.77	0.72	0.80	0.80	0.92
W 6th St & Iowa St	**1.01***	**0.97***	0.82	**0.91***	**1.00***	**1.27***
Bob Billings Pkwy & Iowa St	0.55	0.68	0.70	0.77	**0.86***	**1.09***

Intersection	2014 Pre-East Section AM	2014 Pre-East Section PM	2018 Post East Section AM	2018 Post East Section PM	No Action 2045 AM V/C	No Action 2045 PM V/C
Clinton Pkwy & Wakarusa Dr	0.61	0.73	0.61	0.73	0.78	**1.09***
Clinton Pkwy & Kasold Dr	0.58	0.82	0.50	0.82	0.79	1.43
Clinton Pkwy & Iowa St	0.59	**0.91***	0.58	0.67	0.71	**1.02***
W 23rd St & Massachusetts St	**0.86***	**2.22***	0.82	**1.13***	**1.37***	**2.36***
E 23rd St & Haskell Ave	0.70	**0.96***	0.74	0.67	**0.97***	**0.96***
E 23rd St & O'Connell Rd	0.71	**1.02***	0.59	0.60	0.80	0.79
Iowa St & W 31st St	0.32	0.48	0.43	0.64	0.57	**1.31***
Iowa St & W 33rd St	0.26	0.54	0.32	0.54	0.77	**0.97***
Kasold Dr & W 31st St	0.33	0.67	0.40	**1.00***	**0.87***	**3.11***

***Bold indicates at or over 0.85 threshold**

4. Enhance Safety

Improving traffic safety within the study corridor and the city of Lawrence has been a focus since the initial 1990 EIS and continues to be a primary component of the purpose and need for the SLT SEIS. Crashes are a cost to the travelers of SLT in a variety of ways. Crashes may result in property damage, severe injury or even loss of life. Traffic crashes also cause congestion from blocked travel lanes and intersections, resulting in increased gas consumption and lost time. Study area improvements are intended to help reduce crash rates and the frequency and severity of crashes.

a. Historical Safety Conditions

The SLT 1990 and 2002 environmental studies primarily focused on the impact of K-10 Highway on arterial streets that served as the existing K-10 Highway route through the city of Lawrence. The initial 1990 EIS utilized the November 1983 *Lawrence, Kansas Traffic Engineering Safety Plan* to identify safety concerns within the study area. The study found that 7 of the top 20 intersections with the highest annual crash costs were along 23rd Street or 31st Street, and 3 of the 4 mid-block segments with the highest crash rates were on 23rd Street.

The subsequent SLT East Section EIS completed in 2002 continued to identify safety as a key component of the purpose and need. The 2002 EIS concluded that crash rates along city streets used as part of the existing K-10 Highway connection – specifically Iowa Street between K-10 Highway and 23rd Street, and 23rd Street between Iowa Street and Haskell Avenue – exceeded the statewide average for similar facilities. It also concluded that due to projected traffic growth, even higher crash rates were expected along the K-10 Highway corridor in the future if no improvements were made to construct the SLT corridor.

b. Existing Safety Conditions

South Lawrence Trafficway Corridor

Since the completion of the SLT East Section in 2016, local Lawrence arterial streets are no longer used as the primary route for the K-10 Highway though Lawrence; this traffic has shifted to the SLT East and West Sections. The focus on safety remains and now includes the West Section 2-lane expressway facility. An analysis of crash rates within the SLT's West Section (N 1800 Rd to Iowa St) of the SLT before and after the opening of the East Section (Iowa St to E 23rd Street/K-10 Highway Interchange) in November 2016, shows that crash rates increased after the opening of the East Section.

Table 9 shows the breakdown of crash rates before and after the opening of the SLT East Section. Crash rates for the period after the opening of the East Section currently cover December 2016 through December 2017, one year in length.

Table 9: SLT Corridor Pre and Post East Section Opening Crash Rates

Analysis Segments (SLT)	SLT Pre-East Section Opening		SLT Post-East Section Opening	
	January 2012 - October 2016		December 2016 - December 2017	
	Crash Rate	Fatal Crash Rate	Crash Rate	Fatal Crash Rate
	(MVMT)	(HMVMT)	(MVMT)	(HMVMT)
N 1800 Rd to I-70 NB Ramp Terminal	0.99	0.00	**2.20***	0.00
Between I-70 Ramps	**1.60***	0.00	**4.08***	0.00
I-70 to W 6th St	0.26	0.00	1.14	0.00
W 6th St Interchange	0.85	0.00	0.24	0.00
W 6th St to Bob Billings Pkwy	0.46	0.00	**4.07***	0.00
Bob Billings Pkwy Interchange	0.46	0.00	0.46	0.00
Bob Billings Pkwy to Clinton Pkwy	0.42	0.00	0.62	0.00
Clinton Pkwy Interchange	0.96	0.00	1.14	0.00
Clinton Pkwy to W 27th St	0.49	0.00	0.49	0.00
W 27th St to Kasold Dr (E1200)	0.65	**1.91***	**1.62***	0.00
Kasold Dr (E1200) to Iowa St	0.71	**4.74***	1.48	0.00
Two Lane Undivided Rural Highway with Partial Access Control - Statewide Average Crash Rates	**1.054**	**2.120**	**1.516**	**0.886**

MVMT - Million Vehicle Miles Traveled
HMVMT - Hundred Million Vehicle Miles Traveled
*** Bold indicates exceeds statewide average crash rate.**

Traditionally, crash data is provided by KDOT and crash rates are calculated in five-year increments. However, since the East Section of the SLT opened in late 2016, data is currently only available through calendar year 2017 and will be updated as the study progresses, and data becomes available.

After the opening of the East Section in 2016, there were four segments on the West Section with crash rates that exceeded the statewide average for similar facilities: N 1800 Rd to I-70 WB Ramp Terminal, between the I-70 Ramp Terminals, 6th St to Bob Billings Parkway, and W 27th Street to Kasold Drive. Before the opening of the East Section, only one segment experienced crash rates above the statewide average. This indicates that crash rates have worsened in comparison to the statewide average crash rate for similar facilities since the opening of the East Section.

Table 10 shows the crashes by severity of crashes for the SLT corridor before and after the opening of the East Section. The crashes are subdivided into three severity categories – Property Damage Only (PDO), Injury Crashes and Fatal Crashes. Placeholder here for discussion of change in crashes before and after East Section opened to traffic.

Table 10: SLT Corridor Pre and Post East Section Opening Crashes by Severity Category

Analysis Segments (K10)	Pre-East Leg Opening				Post-East Leg Opening			
	January 2012 - October 2016				December 2016 - ?			
	Fatal Crashes	Injury Crashes	Property Damage Only	Total Crashes	Fatal Crashes	Injury Crashes	Property Damage Only	Total Crashes
N 1800th Rd to E 850 Rd	0	1	3	4	Data not yet available	Data not yet available	Data not yet available	0
E 850 Rd - Between I-70 Ramps	0	3	4	7				0
I-70 to W 6th St	0	3	8	11				0
6th St Interchange	0	0	16	16				0
6th St to Bob Billings	0	0	3	3				0
Bob Billings Interchange	0	1	8	9				0
Bob Billings to Clinton Pkwy	0	2	6	8				0
Clinton Pkwy Interchange	0	2	13	15				0
Clinton Pkwy to W 27th St	0	2	16	18				0
W 27th St to Kasold (E1200)	1	9	24	34				0
Kasold (E1200) to Iowa St	1	1	13	15				0
Total	**2**	**24**	**114**	**140**	**0**	**0**	**0**	**0**

Two fatal crashes occurred during the five-year period before the opening of the East Section, one between W 27th Street and Kasold Dr and another between Kasold Dr and Iowa Street. Crash severity is a concern in this portion of the corridor due to the at-grade, signalized intersection at W 27th Street and SLT. No fatal crashes occurred in the first year after the opening of the East Section. However, two fatalities are known to have occurred on the SLT West Section in 2018 (note: documented data for 2018 has not yet been compiled and released by KDOT). One fatality was at the Clinton Parkway curve and the other was between US-59/Iowa Street and Kasold Dr.

The most common types of crashes on the SLT corridor during the pre-East Section opening period include rear end and angle crashes with 14 crashes each, followed by sideswipe with 11 crashes and head-on collisions with 3 crashes out of the 140 total crashes. Placeholder here for discussion of change in crash types before and after East Section opened to traffic.

Local Arterial Intersections

Crash rates for select arterials within the city of Lawrence were calculated for a period before and after the opening of the East Section in November 2016. Georeferenced crash data from KDOT for arterials for the period after the opening of the East Section was not yet available at the time of this analysis, so a post opening analysis will be completed as the study moves forward and the data becomes available. Crash rates for urban arterials in the state of Kansas are not available, so crash rates were compared to the overall statewide average for all crashes in the state of Kansas to provide a comparison. Additionally, the portion of Haskell Avenue at the K-10/SLT Highway Ramp Terminals was not constructed before the completion of the East Section, therefore it is shown as "Not Built" in the table below. **Table 11** below shows the crash rates for select arterials within the city of Lawrence that connect to the SLT[1].

Table 11: Local Arterial Street Pre and Post SLT East Section Opening Crash Rates

Street	Arterial Roadway Segments	Pre-East Section Opening January 2012 - October 2016		Post-East Section Opening December 2016 – December ?	
		Crash Rate (MVMT)	Fatal Crash Rate (HMVMT)	Crash Rate (MVMT)	Fatal Crash Rate (HMVMT)
Iowa St	N 1100 Rd to N 1250 Rd	0.53	0.00	Data not yet available	Data not yet available
Iowa St	N 1250 Rd to W 34th St.	0.21	0.00		
Iowa St	W 34th St to W 33rd St	**6.77***	0.00		
Iowa St	W 33rd St to W 31st St	**6.81***	0.00		
Iowa St	W 31st St to Clinton Pkwy	**7.42***	0.00		
Iowa St	Clinton Pkwy to Bob Billings Pkwy	**5.89***	0.00		
Iowa St	Bob Billings Pkwy to W 6th St	No Traffic Volume	No Traffic Volume		
Iowa St	I-70 to south of Princeton Blvd	No Traffic Volume	No Traffic Volume		
Iowa St	I-70 to N 1800 Rd	No Traffic Volume	No Traffic Volume		
McDonald Dr	W 6th St to I-70 Ramps	No Traffic Volume	No Traffic Volume		
McDonald Dr	Between I-70 Ramps	No Traffic Volume	No Traffic Volume		
E 1200 Rd	K-10 to W 31st St	1.65	0.00		
Kasold Dr	W 31st St to Clinton Pkwy	1.31	0.00		
Kasold Dr	Clinton Pkwy to Bob Billings Pkwy	No Traffic Volume	No Traffic Volume		
Kasold Dr	Bob Billings Pkwy to W 6th St	No Traffic Volume	No Traffic Volume		
Kasold Dr	W 6th St to N 1800 Rd	**4.26***	0.00		

[1] (*Traffic Volumes were not available at the time of the draft of this document. Roadway segments with 'No Traffic Volume' will be updated once the data and existing traffic analysis is complete.)*

Street	Arterial Roadway Segments	Pre-East Section Opening		Post-East Section Opening	
		January 2012 - October 2016		December 2016 – December ?	
		Crash Rate	Fatal Crash Rate	Crash Rate	Fatal Crash Rate
		(MVMT)	(HMVMT)	(MVMT)	(HMVMT)
Wakarusa Dr	K-10 to Clinton Pkwy	**2.26***	0.00		
Wakarusa Dr	Clinton Pkwy to Bob Billings Pkwy	No Traffic Volume	No Traffic Volume		
Wakarusa Dr	Bob Billings Pkwy to W 6th St	No Traffic Volume	No Traffic Volume		
6th St	Between K-10 Ramp Terminals to Wakarusa Dr	0.08	0.00		
6th St	Wakarusa Dr to Kasold Dr	**2.93***	**1.64***		
6th St	Kasold Dr to Iowa St	**5.59***	0.00		
Bob Billings Pkwy	Between K-10 Ramps	0.00	0.00		
Bob Billings Pkwy	K-10 Interchange to Wakarusa Dr	No Traffic Volume	No Traffic Volume		
Bob Billings Pkwy	Wakarusa Dr to Kasold Dr	No Traffic Volume	No Traffic Volume	Data not yet available	Data not yet available
Bob Billings Pkwy	Kasold Dr to Iowa St	No Traffic Volume	No Traffic Volume		
Clinton Pkwy	Between K-10 Ramps	0.00	0.00		
Clinton Pkwy	K-10 Interchange to Wakarusa Dr	No Traffic Volume	No Traffic Volume		
Clinton Pkwy	Wakarusa Dr to Kasold Dr	1.20	0.00		
Clinton Pkwy	Kasold Dr to Iowa St	**3.57***	0.00		
W 23rd St	Iowa St to Massachusetts St	**8.45***	**1.52***		
W 23rd St	Massachusetts St to Haskell Ave	**6.94***	0.00		
W 23rd St	Haskell Ave to E Hills Dr	**3.73***	0.00		
N 1800 Rd	Iowa St to E 1200 Rd	0.82	0.00		
N 1800 Rd	E 1200 Rd to E 850 Rd (K-10)	0.57	0.00		
N 1800 Rd	E 850 Rd (K-10) to E 800 Rd	0.97	**19.45***		
N 1800 Rd	E 800 Rd to E 600 Rd	0.67	0.00		
Mass. St	W 23rd St to W 6th St	**7.84***	0.00		
Haskell Ave	Between K-10 Ramp Terminals	Not Built	Not Built		
Haskell Ave	K-10 to W 23rd St	1.38	0.00		
E 800 Rd	W 6th St to N 1800 Rd	1.23	0.00		
Statewide Average Crash Rates for All Public Roads#		**2.1**	**1.2**		

MVMT - Million Vehicle Miles Traveled
HMVMT - Hundred Million Vehicle Miles Traveled
* **Bold indicates exceeds statewide average crash rate.**
# Crash Rates for Arterials are not available for Kansas, the overall crash rate for all public roads is instead used.

Pre-East Section opening, thirteen segments of the studied arterials experienced crash rates higher than the statewide average for all crashes in Kansas. Three segments experienced "fatal" crash rates higher than the statewide average. Placeholder to add findings for post-East Section opening for arterials once data is available.

c. Future Safety Conditions

Since only one year of post-East Section opening data is currently available, future 2045 No Action trends and forecasts of safety conditions have not been performed for the SLT corridor or local arterials. However, future traffic volumes are anticipated to increase throughout the SLT corridor, both on SLT and the local arterial network, as population increases, and new land use and development occurs within the Lawrence metro area and throughout Douglas County. This increase in traffic could strain already stressed roadways in the study area, especially if no improvements are made to the SLT West Section as local and regional traffic continues to shift to the SLT corridor. This could contribute to an increase in crash frequency and severity if no improvements are made.

5. Promote a Multimodal Transportation System

Multimodal planning refers to transportation and land use planning that considers diverse transportation options, typically including walking, cycling, public transit, passenger automobiles and commercial trucks, and accounts for land use factors that affect accessibility. Transportation modes that pertain to the SLT (other than passenger automobiles) include public transit, bicycle, and pedestrian modes, as well as commercial trucks for goods movement. The proposed improvements to the SLT corridor need to coordinate and be consistent with planned and proposed multimodal uses in the study area.

Transportation 2040 (*T2040*), adopted March 15, 2018, is the long-range transportation plan for the City of Lawrence and surrounding lands that are under the jurisdiction of the Lawrence-Douglas County Metropolitan Planning Organization (MPO). The Plan identifies future transportation needs of the region through the year 2040 and sets regional goals and system improvement recommendations for a multimodal transportation system. The following sections describe the existing and planned multimodal uses and improvements for the SLT study area.

a. Public Transit

There are two fixed route bus service providers operating in the city of Lawrence: Lawrence Transit and KU on Wheels (KUOW); however, the KUOW routes are not in the vicinity of the SLT. The existing bus routes of the Lawrence Transit system within and adjacent to the study area travel along W 27th Street and Wakarusa Drive northeast of the SLT/27th Street intersection, along 33rd Street just north of the US-59 (Iowa Street)/SLT interchange, and along Overland Drive two blocks north of 6th Street and into Rock Chalk Park.

Lawrence Transit also provides a complementary public paratransit service (T-Lift) to comply with the Americans with Disabilities Act (ADA). The University of Kansas Parking & Transit Office provides paratransit service (Jaylift), which is available to KU students, faculty and staff with a KU origin or destination. Additionally, other smaller agencies in Lawrence also operate specialized transportation/paratransit services. All the paratransit services could potentially include travel on the SLT.

Local and Regional Transit Plans

One transit planning study, the *Commuter Park & Ride Study* (2014), relies on required SLT improvements to accommodate the study's proposed transit recommendations. The recommendations that pertain to the SLT include park and ride locations at the I-70 interchange (one lot currently exists), the US-40 (6th Street) interchange, and development of a shared use facility (shared with a commercial lot) at the US-59 (Iowa Street) interchange.

b. Bicycle and Pedestrian Facilities

A Bikeway System Map is included in the *T2040* document and shows existing and proposed/future bicycling facilities. A review of the Bikeway System Map, aerial photography, and a windshield survey of the study area indicate that bicycle facilities exist at several locations along the study area and are separated into the categories of Bike Routes (shared roadways), Bike Lanes (on-street), Shared Use Paths, and Recreational Trails. Although none of these bicycle facilities are integral with the SLT travel lanes, some run along and cross the SLT right of way. The existing bicycle-pedestrian facility that travels parallel to and in the vicinity of the SLT is classified as a Shared Use Path.

An existing Shared Use Path also crosses the SLT at the Bob Billings Parkway interchange, the Clinton Parkway interchange, and the W 27th Street intersection with the SLT. A designated Bike Route exists along N 1800 Rd, and designated Bike Lanes exist through the Bob Billings Parkway interchange. There are currently no existing bicycle facilities crossing the SLT at the US-40 (6th Street) interchange or at the US-59 (Iowa Street) interchange.

Local and Regional Bicycle Plans

Several local and regional bicycle plans are described below that the SLT SEIS needs to be consistent with as the study and its improvement alternatives move forward.

- ***Lawrence-Douglas Countywide Bikeway System Plan*** (2014) – The Lawrence-Douglas Countywide Bikeway System Plan (dated December 2013) provides details of the existing and proposed bikeway network for the Lawrence urbanized area, proposes bikeway connections throughout the remainder of Douglas County, and includes an Existing and Proposed Bikeways map. As of the writing of this document, the Lawrence - Douglas County MPO is updating the bikeway plan. The updated plan is expected to be complete by Summer 2019.
- ***Proposed/Future Bicycle Facilities*** – A review of the Existing and Proposed Bikeways Map indicated that proposed/future bicycle facilities that can be accommodated by the SLT improvements are at the following locations (within the SLT right of way): N 1750 Rd, US-40 (6th Street)/SLT interchange, N 1800 Rd at Lecompton Rd/E 600 Rd, E 600 Rd between N 1800 Rd and US-40, along US-40, and Wakarusa Drive south of W 27th St.
- ***Lawrence Pedestrian Bicycle Issues Task Force Report*** (2016) – This study recognized that facilities for walking, wheeling and biking are vital parts of a safe transportation system

requiring annual public investment. Some of the recommendations of the study that need to be coordinated with the SLT improvements within the right of way include the following:

- Invest in high quality pedestrian and bicycle facilities built during new road construction and existing road reconstruction projects.
- Invest in pedestrian facilities that provide safer conditions and access for seniors and people with disabilities.

- ***Horizon 2020*** (2018) – *Horizon 2020* is the current comprehensive land use plan for the city of Lawrence and the unincorporated areas of Douglas County. Although it does not contain a separate section specifically pertaining to bicycles and pedestrians, one of the goals stated in the Parks, Recreation, and Open Space section of *Horizon 2020* is to improve community accessibility and connectivity to and from existing and future parks, recreation, and open space areas and facilities by using "…street and utility improvement projects as opportunities to include the addition and/or improvement of sidewalks, trails, and bike lanes." This plan is currently being updated by the city of Lawrence.

Local and Regional Pedestrian Plans

Although there are no sidewalks along the SLT mainline, some connect with the SLT Shared Use Path and some cross the SLT at the Bob Billings Parkway Interchange, the Clinton Parkway Interchange, and the 27th Street intersection with the SLT. Sidewalks currently do not cross the SLT at the US-40 (6th Street) interchange, nor at the US-59 (Iowa Street) interchange. To provide pedestrian access to and from existing and future developments on each side of the SLT, the addition of pedestrian and sidewalk facilities will be considered as part of the SLT project alternatives in order to be consistent with *T2040*, as well as the plans discussed below.

- ***Regional Pedestrian Plan*** (2016) – This Plan represents a vision of a more accessible and safer pedestrian environment in the region and presents tools that cities in Douglas County can implement to improve the pedestrian environment and encourage more people to walk. Some of the strategies of the plan that need to be coordinated with the SLT improvements include the following:

  - Install traffic calming devices, where appropriate, to improve pedestrian safety and comfort.
  - Invest in pedestrian facilities built during new road construction and existing road reconstruction projects.
  - Construct ADA-compliant ramps at locations where no or non-compliant curb ramps exist.

- ***Lawrence Pedestrian Bicycle Issues Task Force Report*** (2016) – See description of this report under Local and Regional Bicycle Plans above.

c. Commercial Trucks

Commercial trucks are a component of the traffic stream in the study area. The SLT corridor has regional significance for goods movement though its connections to K-10 Highway and I-70. Regional truck generating facilities within the vicinity of the SLT study area include businesses such as Berry Plastics, Standard Beverage Corporation, O'Malley Beverage and the K-Mart Distribution Center. In addition, the BNSF Intermodal Facility is located at I-35 and Homestead Road in the southwest part of the Kansas City metro area and significant commercial truck traffic uses SLT and the K-10 Highway between Kansas City and Lawrence to connect to I-70 to and from this facility.

According to KDOT's 2018 traffic flow map (traffic counts recorded during calendar year 2017), a range of 4-6 percent of the daily vehicles in the SLT corridor are trucks west of US-59/Iowa Street and approximately 5 percent east of US-59/Iowa Street. By comparison, the I-70 corridor west of the SLT carries approximately 13.5 percent trucks and east of SLT carries 16.5% trucks. This indicates that while the SLT does not carry a high percentage of commercial truck traffic today, it still plays a regional role in the distribution of goods movement between K-10 and I-70 that needs to be considered for the SLT proposed improvements.

6. Support Local and Regional Growth

Regional land use and development patterns provide insights into a community's transportation needs. As growth and future land development occur in the vicinity of the study area, in accordance with the local and regional land use plans and specific Area Plans, it is anticipated that local and regional traffic volumes and travel times would increase on SLT and at local area arterials as a result of residential and commercial development and ensuing population growth. The SLT corridor is included as a major thoroughfare in the Horizon 2020 future land use plan and all the adjacent Area Plans and is therefore compatible with these plans. In addition, the SLT corridor is included as a major freeway thoroughfare in the MPO's long range transportation plan, *T2040*. Capacity improvements to the SLT West Section, as well as improved access, interchange improvements, and improved transportation connections are necessary to support the planned and forecasted growth of the area. The following sections describe the future area land use and development plans in the vicinity of the SLT corridor.

Future Land Use Plans

Horizon 2020 is the current comprehensive land use plan for the city of Lawrence and the unincorporated areas of Douglas County. Since the original 1998 adoption of *Horizon 2020*, the MPO has incorporated several amendments to the plan as warranted by changing needs. The most recent amendment occurred in August of 2018, which included the addition of the MPO's metropolitan transportation plan, known as *Transportation 2040*.

One component of *Horizon 2020* was the delineation of the boundaries for the Urban Growth Area (UGA). The UGA encompasses the entire length of the SLT (both East and West Sections). However, the portion of the study area at I-70/E 600 Rd (Lecompton Road) is outside the UGA.

Specific "Area Plans", detailing the future land use of specific areas, have also been developed and are elements of *Horizon 2020*. The specific Area Plans that include or are adjacent to the SLT corridor include the following:

- K-10 & Farmer's Turnpike Plan (Amended 2016)
- West of K-10 Plan (2015)
- Inverness Park District Plan (2012)
- Revised Southern Development Plan (Revised 2013)
- Southeast Area Plan (Revised 2011)
- Farmland Industries Redevelopment Plan (Amended 2016)

These Area Plans will be reviewed and improvement alternatives for the SLT project will coordinate and be consistent with these plans for the study area.

Planned/Future Developments

Based on a windshield survey and a review of the interactive map of "Submittals to the Planning Office" of the Lawrence Planning Department, the following planned or under-construction developments are located in or adjacent to the study area.

- ***Lawrence Memorial Hospital Outpatient Facility*** – This facility, currently under construction, is located in the northeast quadrant of the US-40 (6th Street)/SLT interchange, just south of Rock Chalk Park.
- ***Ranch Estates*** – A planned residential development located about three-fourths of a mile north of the US-40 (6th Street)/SLT interchange on the west side of the SLT.
- ***Mercato 2nd Addition*** – A planned commercial subdivision located adjacent to the northeast quadrant of the US-40 (6th Street)/SLT interchange.
- ***Langston Commons*** – A planned commercial development located adjacent to the northeast quadrant of the Bob Billings Parkway interchange.
- ***KTen Crossing Development*** – A proposed large-scale shopping center located just southeast of the US-59/SLT interchange. Access to this site may affect the type of interchange design options.
- ***The Collegiate at Lawrence*** – A planned multi-family housing development located just northeast of the US-59 (Iowa Street)/SLT interchange.

These planned or under-construction developments will be reviewed and improvement alternatives for the SLT project will coordinate and be consistent with these developments.

C. Planned and Committed System Improvements

Several other projects are planned for the city of Lawrence and the Douglas County area that need to be taken into consideration as the proposed improvements for the SLT corridor are developed. These projects include:

- ***Bicycle and Pedestrian Lanes/Paths*** - The Lawrence-Douglas County MPO has a Countywide Bikeway System Plan (2014) which identifies planned bicycle and pedestrian lanes and/or bike routes in the project study area that are adjacent to or cross the SLT. This plan is currently being updated.
- ***6th Street/K-10 Interchange*** - KDOT has developed preliminary plans to reconfigure the existing 6th Street (US-40)/K-10 Diamond Interchange to a Diverging Diamond Interchange. Further development of the plans has been suspended during the SLT SEIS and will be progressed as traffic conditions warrant.
- ***E 1200 Road (Kasold Drive)/K-10 Intersection Closure*** – KDOT identified this intersection for closure in December 2018 after more than 28 crashes have occurred at the intersection since 2016. The freeway experienced a substantial increase of traffic with the opening of the eastern leg of the South Lawrence Trafficway. This closure is part of a series of interim safety improvements while planning for a long-term solution to expand the freeway to four lanes.
- ***I-70 Acceleration/Deceleration Lane Improvements*** – The Kansas Turnpike Authority is planning and constructing improvements to the acceleration and deceleration lanes at the Lecompton Interchange ramps where they enter and exit the I-70 Turnpike. These improvements will be constructed in fiscal year 2020.
- ***Interim Safety Improvements*** – KDOT has identified several interim safety improvements for SLT, such as a queue warning system and intersection geometric improvements. These improvements would be planned and constructed as interim improvements until a preferred alternative to improve the SLT corridor is selected and funded.

D. Summary

The desired outcome of the SLT SEIS is to select an improvement alternative for the corridor, including future traffic capacity and mode choices, that addresses the key needs outlined in this Purpose and Need Statement. The purpose of the SLT is to provide the traveling public with an efficient and cost-effective transportation facility for users of K-10 Highway and the connected state highway system. In addition, the purpose and need established in the 1990 EIS will be carried forward for the SEIS, which is to relieve congestion on the local street network within the city of Lawrence. The goals of the current proposed project on the West Section are to reduce congestion, enhance safety, promote a multimodal transportation system and support local and regional growth, while minimizing or avoiding impacts to sensitive project environmental features within the project footprint.

The study team will develop and evaluate SLT corridor alternatives based on the purpose and need outlined in this document while seeking to minimize impacts to the man-made and natural environment.