CHAPTER 7 – 110th STREET INTERCHANGE IMPROVEMENTS

The 110th Street interchange is the only direct access to the Village West / Legends commercial and entertainment district from I-70. Additionally this interchange is closest to the Kansas Speedway parking areas, and the currently under construction Hollywood Casino.

Traffic counts were taken at key locations within the study area during both the weekday PM peak hour and the Saturday peak hour. When compared to the existing Saturday peak hour, the existing weekday PM peak hour has larger overall traffic volumes system wide. All analyses for this chapter were completed using weekday PM peak hour traffic flows.

7.1 EXISTING CONDITIONS

Analyses of the existing traffic flows using the current geometric configurations at the interchange of I-70 with 110th Street were performed to determine the existing operational levels of service and improvement needs on 110th Street. The existing weekday PM peak hour design volumes are shown on **Exhibit 7.1.1** and the existing lanes and level of service (LOS) are shown on **Exhibit 7.1.2**.

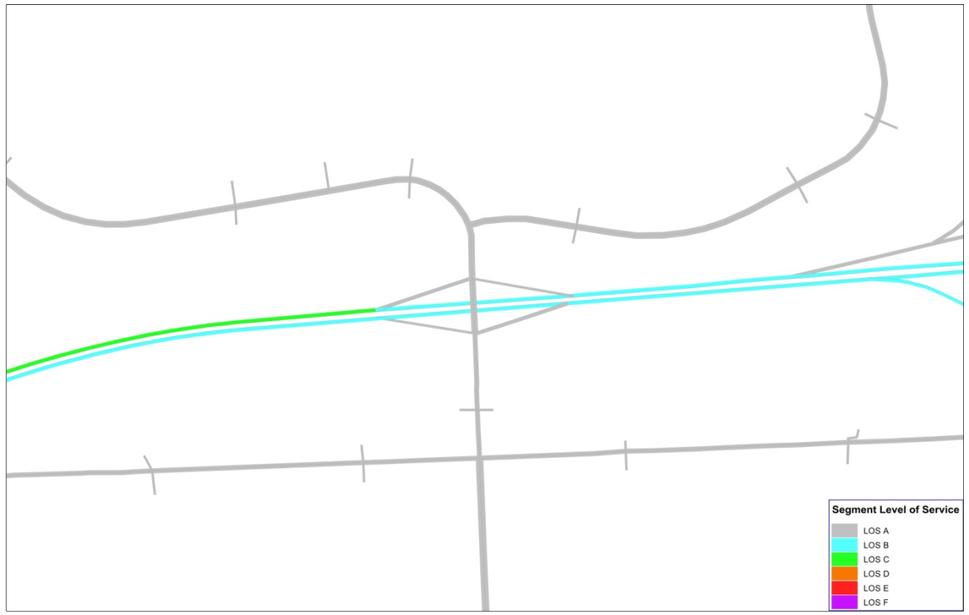

Figure 7.1.1 – Roadway Levels of Service for Existing Weekday PM Peak Hour Traffic Volumes

As displayed in **Figure 7.1.1**, many of the roadway segments in the interchange area currently operate at very good levels of service during the weekday PM peak traffic period with the exception of westbound I-70, west of the 110th Street interchange which currently operates at a LOS C.

7.2 DESIGN YEAR 2040 NO BUILD IMPROVEMENTS

A future travel demand model, including widening improvements of State Avenue between I-435 and K-7; upgrading 118th Street between State Avenue and Donahoo Road; reconstructing the system interchange of I-70 / K-7; adding traffic signals at primary intersections throughout the study area; and other planned improvements listed in Chapter 2, was developed to reflect the anticipated Design Year 2040 land uses and the committed roadway network improvements anticipated to be completed by 2040 (i.e. No Build condition). After running this version of the travel demand model, traffic volumes were developed that could be expected during the Design Year 2040 weekday PM peak hour, assuming no major improvements were constructed within the study area.

The expected Design Year 2040 weekday PM peak hour traffic volumes with the existing I-70 interchange configuration and required signals are displayed on **Exhibit 7.2.1**. **Figure 7.2.1** is a graphical representation of expected level of service for the Design Year 2040 No Build Improvements.

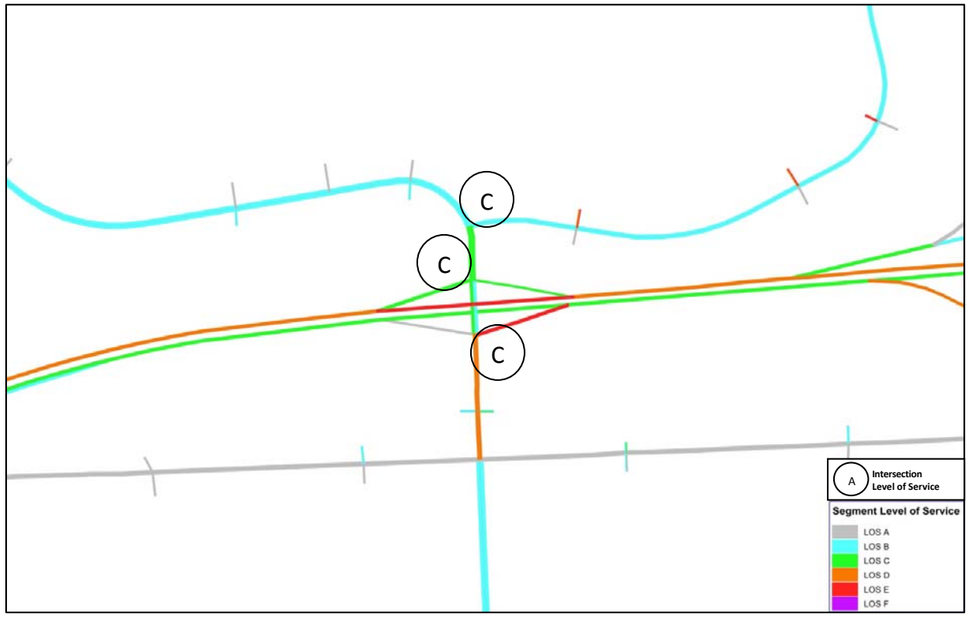

Figure 7.2.1 – Roadway and Intersection Levels of Service for No Build Design Year 2040 Weekday PM Peak Hour Traffic Volumes

As displayed in Figure 7.2.1, the ramps and arterial roadway segments near the 110th Street interchange would be expected to operate at good levels of service during the Design Year 2040 weekday PM peak hour. Westbound I-70 would be expected to operate with LOS D or LOS E while eastbound I-70 would be expected to operate at LOS C. The reduction in level of service is directly related to the projected three percent traffic growth rates per year that would be expected on I-70 and on I-435. Additionally the eastbound on ramp would be expected to operate at LOS E. The signalized intersections on 110th Street would be expected to operate at LOS C.

7.3 DESIGN YEAR 2040 I-70 INTERCHANGE IMPROVEMENT REVIEW

I-70 and 110th Street: State Avenue Improvements

This model scenario evaluates the effects of the interchange improvements on State Avenue as detailed in Chapter 4 on the I-70 / 110th Street interchange. The Design Year 2040 traffic volumes for the existing standard diamond interchange configuration with signals are shown on **Exhibit 7.3.1**.

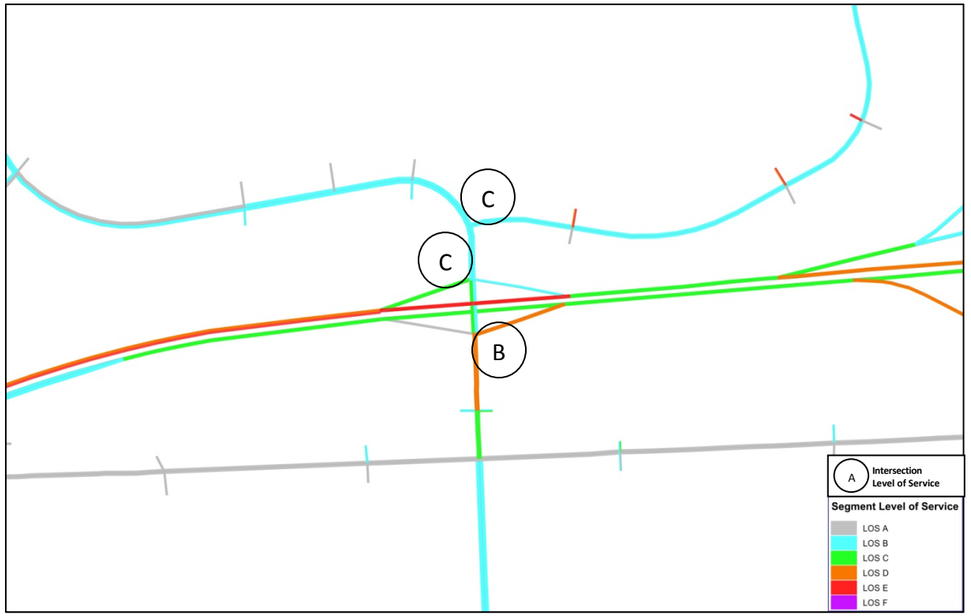

Figure 7.3.1 – Roadway and Intersection Levels of Service for 110th Street with State Avenue Corridor Improvements

As displayed in **Figure 7.3.1**, traffic operations on the majority of the ramps and the arterial roadway segments would be expected to operate at an acceptable level of service during the Design Year 2040 weekday PM peak period. Westbound I-70 west of the 110th Street would be expected to operate at an unacceptable LOS D during the Design Year 2040 weekday PM peak period. Westbound I-70, east of the 110th Street interchange, would benefit from the State Avenue improvements due to less traffic using this interchange and rerouting to the interchange of I-435 and State Avenue. Under this scenario, the signalized intersections on 110th Street would be expected to operate at good to acceptable levels of service.

I-70 and 110th Street: State Avenue Improvements and I-70 / I-435 Interchange Improvements

This model scenario evaluates the effects of the interchange improvements on State Avenue, as detailed in Chapter 4, and the I-70 / I-435 flyover interchange improvements, as detailed in Chapter 6, on the interchange of I-70 with 110th Street. The Design Year 2040 traffic volumes for the existing standard diamond interchange configuration with signals are shown on **Exhibit 7.3.2**.

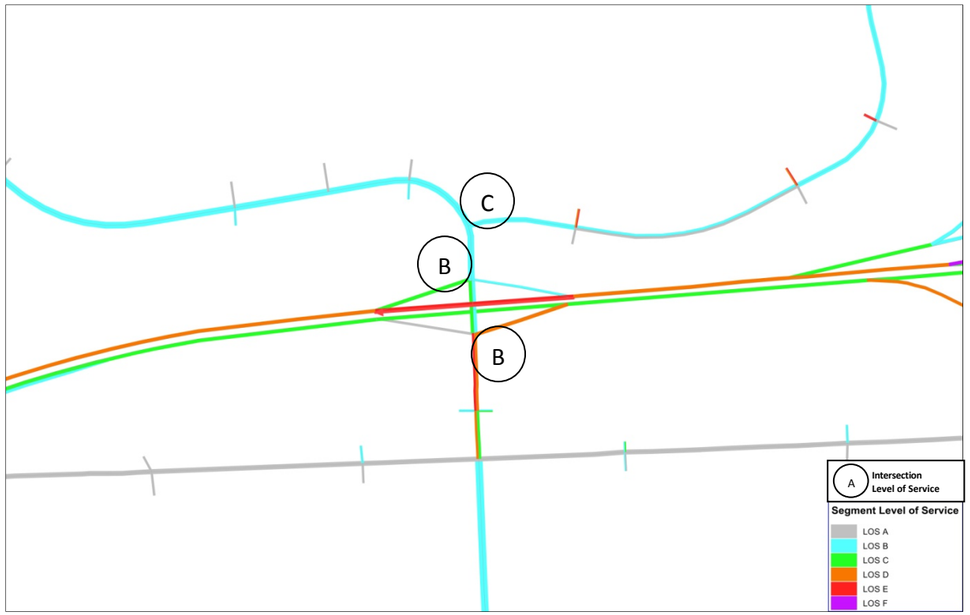

Figure 7.3.2 – Roadway and Intersection Levels of Service for 110th Street with State Avenue Corridor Improvements and I-70 / I-435 Interchange Improvements

As displayed in **Figure 7.3.2**, traffic operations on the majority of the ramps and the arterial roadway segments would be expected to operate at an acceptable level of service during the Design Year 2040 weekday PM peak period. Westbound I-70 Street would be expected to operate at an unacceptable LOS D or LOS E during the Design Year 2040 weekday PM peak period while eastbound I-70 would be expected to operate at an acceptable LOS C. Under this scenario, the signalized intersections on 110th Street would be expected to operate at good to acceptable levels of service.

I-70 and 110th Street: State Avenue Improvements, I-70 / I-435 Interchange Improvements,* Aggressive *Edwardsville Growth

This model scenario evaluates the effects of the interchange improvements on State Avenue as detailed in Chapter 4 and the I-70 / I-435 interchange improvements as described in Chapter 6, on the interchange of I-70 with 110th Street. Additionally this model includes aggressive land use development in Edwardsville at the intersection of 110th Street with Riverview Road.

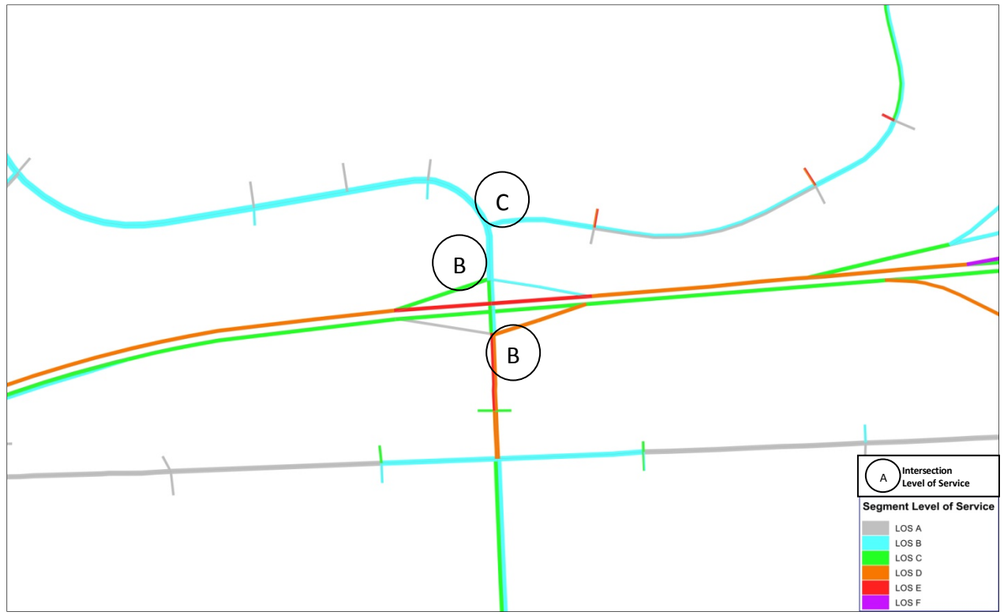

Figure 7.3.3 – Roadway and Intersection Levels of Service for 110th Street with State Avenue Corridor Improvements, I-70 / I-435 Interchange Improvements, and Aggressive Land Use Development in Edwardsville

The traffic associated with the increased development would be expected to increase the traffic volume in this area by between 5 and 10 percent. As displayed in **Figure 7.3.3**, traffic operations on the majority of the ramps and the arterial roadway segments would be expected to operate at an acceptable level of service during the Design Year 2040 weekday PM peak period. Westbound I-70 would be expected to operate at an unacceptable LOS during the Design Year 2040 weekday PM peak period while eastbound I-70 would be expected to operate at an acceptable LOS C. Under this scenario, the signalized intersections on 110th Street would be expected to operate at good to acceptable levels of service.

7.4 I-70 INTERCHANGE RECOMMENDATIONS

Based on the completed analyses and reviews, there are few geometric and traffic control improvements that should be implemented on110th Street between Village West Parkway and Riverview Road to accommodate the Design Year 2040 weekday PM peak period traffic volumes, as well as to satisfy the Saturday and other off-peak or event related traffic demands.

As future traffic volumes warrant along the 110th Street, consider implementing the following improvements listed below:

- Signalize the intersection of 110th Street with Riverview Road, the eastbound I-70 ramp, the westbound I-70 ramp, and Village West Parkway
- Widen 110th Street as a four lane roadway with turn lanes between Riverview Road and the eastbound I-70 ramps.
- Construct a second southbound, left-turn lane on the existing bridge over I-70 to accommodate the turning traffic volumes at the eastbound I-70 ramps
- At the westbound I-70 ramps, construct a second westbound, left-turn lane and a southbound right turn lane
- Construct a northbound right-turn lane and second eastbound left-turn lane at the intersection of 110th Street with Village West Parkway

Many of the recommended improvements listed above are being or planned to be constructed as part of the casino development near the Kansas Speedway.

It should be noted that although significant development is expected to occur within the Village West study area, the 2040 travel demand model indicates an additional interchange at 118th Street on I-70 would not be required to maintain acceptable levels of service on the arterial roadways near the I-70 / 110th Street interchange during the Design Year 2040 weekday PM peak period.