Stantec

Memo

To:	Frank A. Csapo Barrister Commercial Group	From:	Jeff A. Weller, PE Raleigh, NC – JFR
File:	171001597	Date:	August 20, 2020

Reference: Liberty Financial Traffic Impact Study (TIS) Review

Barrister Commercial Group has contracted with Stantec Consulting Services Inc. to review the Traffic Impact Study (TIS) for the proposed Liberty Financial development located at the intersection of US 31E (Bardstown Road) with Bartley Road. Following review of the Liberty Financial TIS dated July 6, 2020, the following sections contain comments pertaining to the TIS.

Study Area

This development is required to prepare a TIS, not just because of the trip generation (KYTC Section 2.1), but also because the TIS includes a proposed connection to the existing signal on US 31E (Bardstown Road) – a state-maintained route – at Southpointe Boulevard (KYTC Section 2.3). As this development meets the requirements in Section 2.3, the TIS meets the study area requirement in Section 3.3, "When Staff determines that the signal modification will affect the operation of a coordinated signal system, the study area shall include all affected signals within the system. There are known deficiencies of this section of US 31E, which include the signal at the I-265 Eastbound Ramp signal. Queues at this signal extend back roughly .5 miles and exist on the interstate mainline. A CORSIM study was previously prepared in 2013 by BTM Engineering, Inc. in association with the proposed Southpointe Development for this corridor studying existing (2009), growth (2013), and development build (2013) scenarios. **Due to the operational issues of the coordinated signal system along the Bardstown Road corridor, proposing to add a 4th leg to the signal at Southpointe Boulevard should have triggered a study area to include the signals upstream and downstream of the affected signal, at a minimum.**

Data Collection

Bartley Road turning movement counts were used from data collected in 2015 with no justification as to why counts were not taken at the same time other counts were taken for this study. Also, methodology for these traffic counts was not discussed in the TIS.

No counts were performed at the intersection of Bardstown Road and Southpointe Boulevard, which includes Bates Elementary School traffic. Additionally, the TIS recommends adding a 4th leg to this intersection without recent counts.

Jefferson County Public Schools (JCPS) were still in session when other data were collected on March 5, 2020.

The TIS collected and used turning count data at the intersection of Bardstown Road and Brentlinger Lane/Cedar Creek Road. Using counts from a separate intersection does not accurately reflect the existing turning traffic at Southpointe Road and does not include southbound vehicles accessing the developments located on the east side of Bardstown Road north of Brentlinger Lane/Cedar Creek Road and counts northbound traffic through that intersection also accessing those same developments in the northeast quadrant of the Bardstown Road/Brentlinger Lane/Cedar Creek Road intersection; it is not accurate to assume that these vehicles would proceed north through the study area just because they traveled through the upstream intersection.

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Analysis

KYTC TIS Regulations Section 5.1 – Operational Thresholds notes that, "Delay for individual turning movements and lane groups shall not exceed 80 seconds. In such cases where intersection delay or individual turning movements are shown to operate with delays greater than 80 seconds under the No Build condition, delay shall not increase." The following are instances included in the Liberty Financial TIS where the analysis violated this "shall" clause:

Scenario	Movement	No Build Delay (s)	Build Delay (s)
2021 AM	EB Left	N/A	98.4
2021 AM	EB Thru/Right	N/A	89.3
2021 AM	WB Left	79.6	82.1
2021 AM	SB Left	7.2	88.7
2021 PM	EB Left	N/A	131.0
2021 PM	EB Thru/Right	N/A	110.0
2021 PM	WB Left	103.2	113.6
2031 AM	EB Left	N/A	96.4
2031 AM	EB Thru/Right	N/A	89.3
2031 AM	WB Left	79.7	82.1
2031 AM	SB Left	7.1	88.8
2031 PM	EB Left	N/A	131.0
2031 PM	EB Thru/Right	N/A	110.0
2031 PM	WB Left	103.2	113.6

No recommendations were included in the TIS to mitigate the increases in delay for any of the movements.

Recommendations

The Conclusion section of the TIS does not outline recommendations to add a 4th leg to the Bardstown Road/Southpointe Boulevard intersection. As such, no recommendations are given for turn lane storages for new movements and storage increases for movements negatively affected by the addition of the phases associated with adding the 4th leg. Additionally, the TIS recommends an exclusive right turn lane for the right-in/right-out (RIRO) access on Bardstown Road, but does not recommend a storage for this turn lane.

Safety Considerations

The TIS only provides an isolated analysis of the Bardstown Road/Southpointe Boulevard signalized intersection. With this intersection operating as part of a coordinated signal system, and this system not being analyzed, the TIS does not show the impacts of the signal timing adjustments for the subject intersection on the adjacent signals. By adjusting the signal timing to allow the Bardstown Road/Southpointe Boulevard intersection to operate at acceptable levels, the phase splits and offsets are likely to be altered and thus adversely impact the adjacent signals. As mentioned in the Study Area section above, the I-265 Eastbound Ramps currently experience queuing that extends back to the interstate mainline. Additionally, the I-265 Westbound Ramps also experience extensive queuing. By affecting the timings at this intersection, the queues are expected to extend back even further. Vehicles stopped on an interstate highway tend to be part of severe crashes as slow and stopped vehicles are not usually expected on these types of facilities.

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Analysis includes a permitted northbound left turn movement with no offset from the opposing southbound left turns. It is preferred to provide an offset for sight distance especially in areas where the turns happen near the crest in the vertical profile of the roadway.

Analysis includes simultaneous permitted side street movements where the westbound approach includes dual left turn lanes and dual right turn lanes. It is generally preferred to have dual left turning movements operate during a protected phase. The eastbound shared through/right could cause trapping of the dual westbound left turning lanes. The analysis includes a protected phase for the eastbound and westbound left turns; however, one of the westbound left turn lanes is a shared left/thru lane. This is likely to cause driver confusion, rash behavior, or severely affect lane utilization and the operations of the signal.

Analysis does not include split side street phasing with approaches including different shared lane geometry. The eastbound approach includes an exclusive left turn lane and a shared through/right turn lane while the westbound approach includes an exclusive left turn lane, a shared left turn/through lane, and dual exclusive right turn lanes. Having these approaches operate under permissive conditions during the same phase is likely to have severe safety implications due to driver expectation.

Please let me know if you have any questions or need to discuss anything further.

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