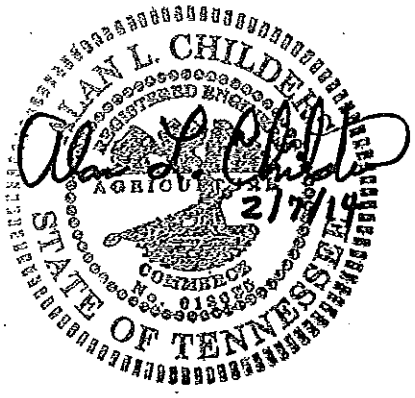
2-SB-14-C

Traffic Impact Study
Century Park
Dutchtown Road, Knoxville, TN

PREPARED FOR:

Commercial and Investment Properties
1225 Weisgarber Road
Knoxville, TN 37909



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EXECUTIVE SUMMARY

This report provides a summary of a traffic impact study update that was performed for the Century Park development located off Dutchtown Road in west Knoxville, Tennessee. The original traffic study was conducted in March, 2004. The project site is located on the south side of Dutchtown Road approximately 0.25 miles east of Pellissippi Parkway (S.R. 162).

The purpose of this study was the evaluation of the traffic operational and safety impacts of the proposed development upon the roadways in the vicinity of the project site. Of particular interest were the intersections of Dutchtown Road at Cogdill Road/Pellissippi Parkway Southbound Ramps, Dutchtown Road at Sherrill Boulevard/Pellissippi Parkway Northbound Ramps, and Dutchtown Road at Century Park Boulevard. Appropriate intersection evaluations were conducted at these locations for existing and future conditions, both with and without traffic volumes generated from the proposed expansion, in order to determine the anticipated impact, and to establish recommended measures to mitigate these impacts. The study included updated traffic counts, intersection capacity analyses, corner sight distance reviews and other evaluations as appropriate.

The primary conclusion of this study is that the traffic generated from the proposed development will have significant impacts on intersection capacity and levels-of-service at the study intersections. This is especially true during the A.M. peak traffic period at the intersection of Dutchtown Road at Sherrill Boulevard/Pellissippi Northbound Ramps and during the P.M. peak traffic period at all three study intersections. The analyses show that the two existing signalized intersections on Dutchtown Road at the Pellissippi Ramps begin to deteriorate under background conditions and will be exacerbated upon full build-out of the development. The poor levels-of-service at the intersection of Dutchtown Road at Century Park Boulevard is primarily due to traffic generated by the proposed development. Improvement analyses show that adding an additional turn lane at one approach each for the Pellissippi Ramp intersections will help to alleviate some of the delay, and installing a traffic signal at Century Park Boulevard will significantly reduce side street delay. This intersection should be reevaluated for justification and need of a traffic signal once the square footage of new proposed buildings exceeds 40,000. A delay study may be useful at the intersection in order to determine the impact of gaps in traffic along Dutchtown Road due to the traffic signals to the west.

The following is a list of measures that should be considered in an effort to address these issues and concerns at the study intersections:

Dutchtown Road at Cogdill Road/Pellissippi Southbound Ramps:

- Construct a second eastbound left-turn lane. This would require a second departure lane to be constructed on the ramp from Dutchtown Road to southbound Pellissippi Parkway, with a merging taper back down to one lane before Pellissippi Parkway.

Dutchtown Road at Sherrill Boulevard/Pellissippi Northbound Ramps:

- Construct a second southbound left-turn lane. This would not require any work on the departure, as Dutchtown Road already has two receiving lanes.

Dutchtown Road at Century Park Boulevard:

- Install a three-phase actuated traffic signal once traffic volumes and intersection delays indicate a need for one. The signal should have communication infrastructure to allow coordination to the existing signals to the west on Dutchtown Road. The installation of the traffic signal is expected to be warranted upon occupancy of the second proposed building constructed having access to Dutchtown Road via Century Park Boulevard.

EVALUATIONS

INTERSECTION CAPACITY ANALYSES

As discussed in the preceding sections of this report, capacity analyses employing the methods of the Highway Capacity Manual (HCM) were conducted for the study intersections. These analyses were performed for existing, background, and anticipated 2022 combined traffic conditions. Existing geometry and traffic control were used in these analyses of the study intersections. In addition, all of the study intersections were analyzed with various intersection improvements. These improvements included adding a second eastbound left-turn lane at the intersection of Dutchtown Road and Cogdill Road/Pellissippi Southbound Ramps, adding a second southbound left-turn lane at the intersection of Dutchtown Road and Sherrill Boulevard/Pellissippi Northbound Ramps, and installing a traffic signal at the intersection of Dutchtown Road and Century Park Boulevard. The signal timing was also optimized when analyzing the intersections for these improvements. TABLE 3 may be referenced for tabular summaries of these analyses, while more detailed summaries are presented on the computer printouts contained in the Appendix.

The analyses indicated that the development will have a significant impact on the study intersections. While the intersection of Dutchtown Road at Cogdill Road/Pellissippi Southbound Ramps will remain at LOS "C" during the A.M. peak from existing traffic to full build-out of the development, the P.M. peak LOS will worse from "D" with existing traffic, to "E" with 2022 background traffic, to "F" at full build-out of the development. The analyses also show that with the improvement of adding a second eastbound left-turn lane, the LOS for full build-out will improve from "F" to "E" with a decrease in average vehicular delay of over 40 seconds.

At the intersection of Dutchtown Road at Sherrill Boulevard/Pellissippi Northbound Ramps, the LOS will worsen from "C" with existing traffic, to "D" with 2022 background traffic, to "E" at full build-out for the A.M. peak traffic period and from a "D" with existing and background traffic to an "E" after full build-out during the P.M. peak. The addition of a second southbound left-turn lane will improve the LOS at full build-out from "E" to "D" for both peak periods.

The intersection of Dutchtown Road at Century Park Boulevard is expected to have a delay of over ten minutes per vehicle for the northbound left-turn movement during the P.M. peak traffic period at full build-out. The analyses indicate that with the installation of a traffic signal, the overall intersection LOS would be a "C" during the P.M. peak without any additional lanes.

TABLE 3
CAPACITY ANALYSIS SUMMARY

Intersection	Time Period	2014 Existing (LOS/Delay)	Year 2022 Background (LOS/Delay)	Year 2022 Combined (LOS/Delay)
Dutchtown Rd at Cogdill Rd/Pellissippi SB Ramps Existing Geometry and Control (SIGNALIZED)[1]	A.M.	C 24.4	C 29.0	C 32.9
	P.M.	D 47.0	E 77.3	F 104.4
Dutchtown Rd at Cogdill Rd/Pellissippi SB Ramps with Improvements (SIGNALIZED)[1]	A.M.	-	-	C 30.9
	P.M.	-	-	E 62.4
Dutchtown Rd at Sherrill Blvd/Pellissippi NB Ramps Existing Geometry and Control (SIGNALIZED)[1]	A.M.	C 34.7	D 54.1	E 73.0
	P.M.	D 35.4	D 46.2	E 73.7
Dutchtown Rd at Sherrill Blvd/Pellissippi NB Ramps with Improvements (SIGNALIZED)[1]	A.M.	-	-	D 51.2
	P.M.	-	-	D 54.4
Dutchtown Rd at Century Park Blvd Existing Geometry and Control (SIDE STREET STOP)[2]	A.M.	C 24.1	D 35.0	F 244.9
	P.M.	D 25.9	F 93.8	F 844.4
Dutchtown Rd at Century Park Blvd with Improvements (SIGNALIZED)[1]	A.M.	-	-	A 7.3
	P.M.	-	-	C 29.9

[1]Level-of-Service and Average Vehicular Delay (seconds) for full intersection using HCM methodology.

[2]Level-of-Service and Average Vehicular Delay (seconds) for the northbound left-turn movement utilizing HCM methodology.

See APPENDIX for detailed computer print-out summaries and discussion of Capacity and Level-of-Service concepts.

TRAFFIC SIGNAL WARRANT ASSESSMENT

A traffic signal warrant analysis was performed for the intersection of Dutchtown Road at Century Park Boulevard for existing, background, and combined conditions using criteria from the Manual on Uniform Traffic Control Devices (MUTCD). The eight hours of data collected from the turning movement traffic count conducted for this study were used to analyze the intersection for traffic signal warrants for existing and 2022 background traffic. Afterwards, it became apparent that MUTCD Warrant #3 (Peak Hour Volumes) was the only warrant that would likely be met, so traffic generated from the proposed development outside of the A.M. and P.M. peak hours was not was not included in the warrant analysis. Because the minor street(Century Park Boulevard) traffic currently has separate right-turn and left-turn lanes, and because the majority of vehicles leaving the development during the P.M. peak are expected to be left-turns, all right-turning vehicles were omitted from the analysis.

The results from the signal warrant analysis indicate that the intersection is not warranted for a traffic signal for existing volumes and is not expected to be warranted using the 2022 background traffic volumes shown in Figure 4. However, the intersection is expected to meet MUTCD Warrant #3 (Peak Hour Volumes) during the P.M. peak using the 2022 combined traffic volumes by 265% of the required minor street volume.

The next step in the analysis was to determine at what point in build-out of the development is the traffic signal expected to become warranted. A signal warrant analysis was performed assuming one building of 40,000 square feet had been built. Trips were generated for this building by taking a ratio of the building floor area to the 300,000 total square feet of the six buildings accessing Century Park Boulevard, and then applying that ratio to the total volumes generated from full build-out of the development. Additionally, it was assumed that the first building would be built and fully occupied by year 2016, so traffic was grown by 2.0% annually for a two-year period. The analysis indicates that a signal is not warranted at this time, as the expected P.M. peak traffic meets 92% of that required for MUTCD Warrant #3. This same exercise was performed for a second building of 60,000 square feet and an assumed full occupancy in year 2018. At this point, the analysis met Warrant #3 by 133% of the minor street traffic. Therefore, a signal warrant is expected to be met at this intersection after build-out of two of the seven buildings accessing Century Park Boulevard. Spreadsheets showing the signal warrant analysis are located in the Appendix.

Finally, capacity analysis for existing geometry and traffic control was performed during the P.M. peak traffic period using the traffic volumes at which point a signal is warrant. This analysis indicates that after build-out of the first two office buildings with four years of background traffic growth, the northbound left-turn movement is expected to operate at LOS "F" with an average vehicular delay of over three minutes. Therefore, not only is the signal

warranted at this point, but capacity analysis suggests that the intersection would benefit from the installation of a traffic signal.