

January 20, 2025

Tim Minor
Tacala, LLC
3750 Corporate Woods Drive
Vestavia Hills, AL 35242

Subject: **CHAPMAN HIGHWAY (US 441) TACO BELL TRAFFIC STUDY, KNOXVILLE, TN.**

Dear Mr. Minor:

This technical memo documents CDM Smith's findings regarding the traffic assessment of the subject Taco Bell site on Chapman Highway in Knoxville, TN. CDM Smith spoke with the Traffic Impact Assessment (TIA) Review Team (Knoxville Regional Transportation Planning Organization, City of Knoxville, and Tennessee Department of Transportation) on behalf of the South Knox Taco Bell Drive-thru site proposed at 2904 Chapman Highway. It is understood that the subject Taco Bell Project on Chapman Highway is requesting a Variance in January and then a Special Use Permit to follow. Special Use Permit application typically requires a TIA.

CDM Smith has reviewed the City of Knoxville TIA Determination form and discussed with Tacala about conversations with the City. The City reviewed the site plan and stated the traffic requirements for driveway access. Per our discussion with the City, we understand a future roadway project on Chapman Highway is now funded through a Federal SS4A Grant, and that future project will enhance all user experiences on Chapman between Woodlawn Avenue and Blount Avenue in the area of the proposed Taco Bell site as shown in **Figure 1**. The future roadway project will include a new hard median on Chapman that will prevent the left-turns in and out of the subject Taco Bell site. In anticipation of the planned Chapman Highway roadway improvements, the City of Knoxville is requiring a right-in /out for the one Chapman Highway access to the site, along with a full access to Martin Mill Pike.

The development "Taco Bell – Dash Style" site plan as proposed in **Figure 2** will have a single access to Chapman Highway and a single access to Martin Mill Pike. The proposed Dash Style does not offer indoor seating. Patrons will be serviced via drive thru and a walk-up counter. New site traffic was determined using the publication, **Trip Generation, 11th Edition**. **Trip Generation** is published by the Institute of Transportation Engineers (ITE) and represents national data collected for many different land uses including industrial, residential, and commercial uses. **Trip Generation** is an essential tool in calculating the traffic, which may be generated by a proposed development. The unadjusted trip generation is 122 vehicles during AM and 83 vehicles during the PM peak hours, as shown in **Table 1**, with a significant amount of pass-by trips.

Pass-by traffic percentages differ relative to specific land uses and their densities. Some studies have shown varied results; however, the ITE publications, Transportation and Land Development by Virgil G. Stover and Frank J. Koepke, and Trip Generation, have combined these studies to suggest uniform rates for given land uses. These rates range from 14-percent for hardware stores to 60-percent for neighborhood shopping centers, gross leasable area less than 100,000 square feet. Service stations and fast-food restaurants also exhibit high pass-by rates of 58-percent and 45-percent, respectively. Pass-by adjustment for this Taco Bell site could range from 45 to 60%.



Figure 1. Area of Proposed Taco Bell Site

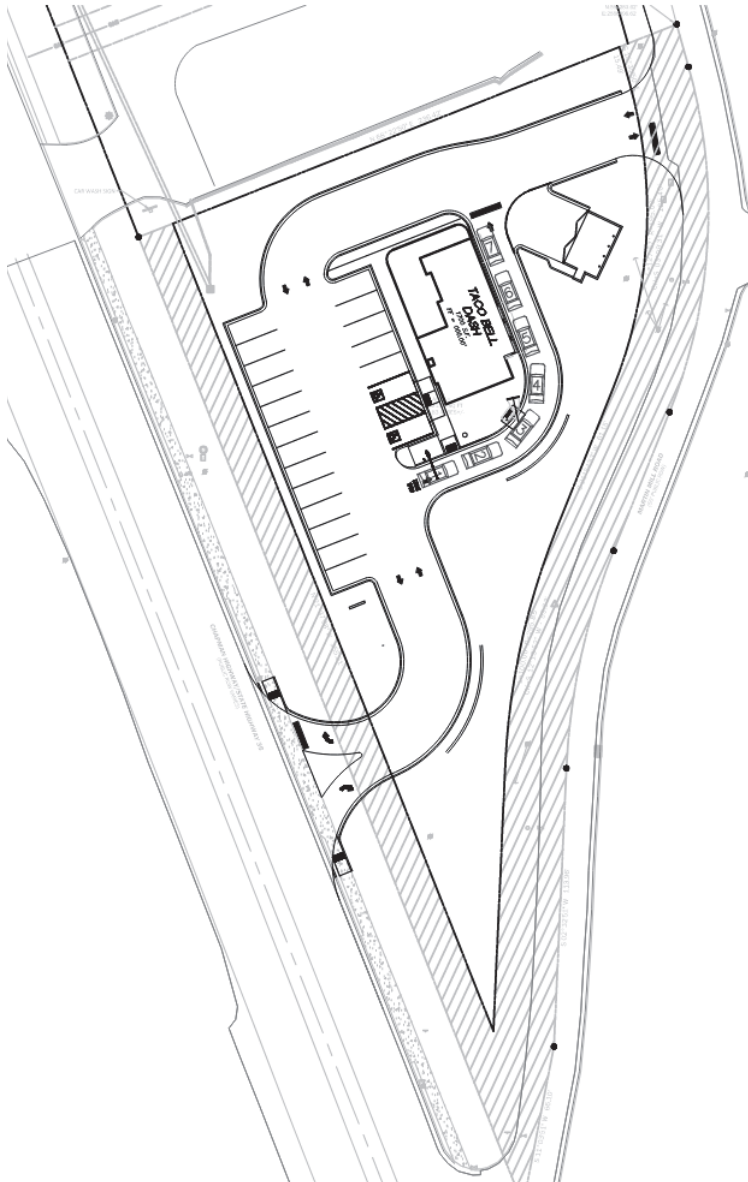


Figure 2. Taco Bell - Dash Style Site Plan.

Table 1. Trip Generation.

TRIP GENERATION									
20-Jan-25									
LAND USE	L.U.C	SIZE	DAILY TRAFFIC	AVERAGE					
				ENTER	AM PEAK EXIT	TOTAL	ENTER	PM PEAK EXIT	TOTAL
RESTAURANT (w. drive t	934	2,500	1,169	57	55	112	43	40	83

When considering the existing transportation network plus the future SS4A Grant improvements to Chapman Highway, Taco Bell traffic impacts are expected to be minimal and sufficiently accommodated.

Right-in/out driveways are efficient with less conflicts than a full access. The full access to Martin Mill Pike will occur via the Lippencott Street intersection. Lippencott Street is signalized at Chapman Highway which has a 5-lane cross-section to accommodate additional left-turns, if they occur. The TIA would not provide any further recommendations than have been identified at this time by the City Staff.

The City of Knoxville stated that there is a concern to document the sight distance for the Chapman Highway right-in/out access due to the vertical crest curve south of the site. CDM Smith conducted a sight distance measurement in the field following the guidelines of the American Association of State Highway and Transportation Officials (AASHTO) Green Book, (*A Policy on Geometric Design of Highways and Streets, 7th Edition*). **Figure 3** illustrates the approaching driver view from Woodland Ave on Chapman Highway. This location has 460 feet of available sight distance looking south (left) for both drivers to be aware of each other in making the decision to enter the roadway (from the driveway) and adjusting travel speed to slow if needed (by the Chapman Highway) driver while the right-turn vehicle accelerates.

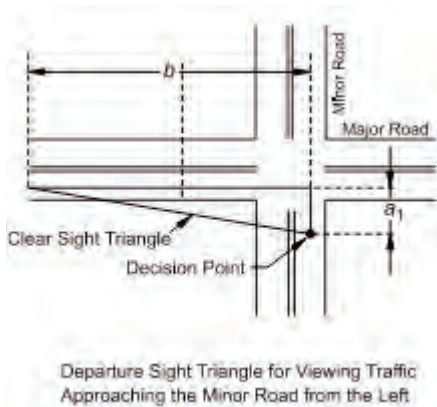
Table 3-2. Stopping Sight Distance on Grades

Design Speed (mph)	U.S. Customary					
	Stopping Sight Distance (ft)					
	Downgrades			Upgrades		
	3%	6%	9%	3%	6%	9%
15	80	82	85	75	74	73
20	116	120	126	109	107	104
25	158	165	173	147	143	140
30	205	215	227	200	184	179
35	257	271	287	237	229	222
40	315	333	354	289	278	269
45	378	400	427	344	331	320
50	446	474	507	405	388	375
55	520	553	593	469	450	433

Chapman Highway has a posted speed limit of 45 MPH with a downgrade of approximately 6% approaching the site access right-in/out. The available line of sight of 460 feet between site access and Woodlawn Ave is more than the 400 feet requirement per Table 3-2.

A scenario calculating stopping and intersection sight distance for passenger cars are provided as a right turn from stop on the minor approach as shown in Table 9-9. The required corner or intersection line of sight is much reduced for a right only access due to reduced number of conflicts. For a 45-mph roadway, the corner sight distance in the right-turn scenario is a minimum of 430 feet which is available from the Taco Bell driveway having a line of sight of 460 feet.

Table 9-9. Design Intersection Sight Distance—Case B2, Right Turn from Stop



Design Speed (mph)	Stopping Sight Distance (ft)	U.S. Customary	
		Intersection Sight Distance for Passenger Cars	
		Calculated (ft)	Design (ft)
15	80	143.3	145
20	115	191.1	195
25	155	238.9	240
30	200	286.7	290
35	250	334.4	335
40	305	382.2	385
45	360	430.0	430
50	425	477.8	480
55	495	525.5	530
60	570	573.3	575
65	645	621.1	625
70	730	668.9	670
75	820	716.6	720
80	910	764.4	765

Note: Intersection sight distance shown is for a stopped passenger car to turn right onto or to cross a two-lane roadway with no median and with grades of 3 percent or less. For other conditions, the time gap should be adjusted and the sight distance recalculated.



Figure 3. Chapman Highway Northbound Approach Sight Distance.



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The trip generation of the site suggests a minimal traffic impact. With that consideration and acceptable line of sight, any requirement of a TIA should be clearly unnecessary.

With the review by the City identifying the required turn restrictions at the site accesses and knowing that the upcoming SS4A Grant project on Chapman Highway will significantly change the experience along this corridor restricting turns exclusively to existing traffic signals, the recommendation of this study would be to seek a waiver for the TIA requirement of the Special Use Permit process. While the Taco Bell applicant wants to provide the necessary information to move the project forward, a TIA would not offer any further recommendations following that required Corner/Intersection and Stopping Sight Distance has been confirmed to be available.

Sincerely,



Kevin A. Cole, PE
Senior Transportation Engineer
CDM Smith Inc.

cc: Jeff Mize, CDM Smith