

# MEMORANDUM

<b>To:</b>	Ryan Rands – MoDOT Bryson Baker, PE – City of Sunset Hills
<b>From:</b>	Chris Beard, PE, PTOE
<b>Date:</b>	May 15, 2018
<b>Subject:</b>	Technical Memorandum Proposed Tidal Wave Car Wash Sunset Hills, Missouri Lochmueller Group Project 518-0050

Lochmueller Group is in the process of preparing a traffic impact study for the proposed development of a Tidal Wave Car Wash, located on the site of the former Econolodge Motel in the southeast quadrant of Lindbergh Boulevard and East Watson Road/Rott Road in Sunset Hills, Missouri. In addition to a car wash, the development would include fuel pumps (12 total fueling positions) plus a convenience store and coffee shop with drive-thru housed within an 11,000 square-foot building shared with the car wash.

As an initial step in the traffic study, this technical memorandum is provided to document the assumptions that are critical to the study's development. This memorandum specifically addresses the anticipated trip generation characteristics of the proposed development, the directional distribution of trips, and background sites (if any) to be included in the post development analysis. These assumptions are hereby submitted to MoDOT and the City of Sunset Hills for review and comment. It is our intent to reach a consensus with both agencies prior to completing the remainder of the traffic impact study.

## **Trip Generation**

Given the multitude of uses proposed for the site, it was decided at the scoping meeting to calculate trip generation using two methods and then to apply the most applicable method. Note for purposes of forecasting trip generation that the study peak periods were established as the weekday morning commuter peak hour, the weekday afternoon commuter peak hour, and the midday peak hour on a Saturday.

The first method utilized Trip Generation, 10<sup>th</sup> Edition, published by the Institute of Transportation Engineers (ITE). This method is commonly employed by transportation engineers to forecast the amount of trips that would be generated by various land uses. Data for Land Use Code: 960 Super Convenience Market/Gas Station was determined to be most relevant to the proposed development, as the sites in the category have a convenience market in excess of 6,000 square feet and at least 12 vehicle fueling positions. Applying the average rate for Land Use 960 (due to small sample size) to the proposed square footage resulted in the "Method 1" trip generation projection in **Table 1**.

The second method was based on the actual trip generation of a similar facility, obtained from driveway counts of the site, located in the northeast quadrant of Long Road and Edison Avenue in Chesterfield, Missouri. This development includes a Tidal Wave Car Wash, fuel pumps with 16 vehicle fueling positions, a convenience store, and a bakery/coffee shop with drive-thru. These characteristics are



nearly identical to the proposed development, with the exception that the Chesterfield site has 4 additional vehicle fueling positions.

Counts of all access driveways of the Chesterfield site were performed on Friday May 4<sup>th</sup> and Saturday May 5<sup>th</sup>. Both days were free of precipitation that would potentially impact car wash patronage. The trip generation obtained from the counts is summarized in **Table 1** as “method 2”.

**Table 1: Trip Generation Comparison – ITE versus Similar Site**

Land Use	Size	Weekday AM Peak Hour			Weekday PM Peak Hour			Saturday Midday Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
Method 1: ITE 960	11,000 SF	353	353	706	360	360	721	158	158	316
Method 2: Similar Site	11,940 SF	157	167	324	156	161	317	153	141	294

As shown in **Table 1**, the ITE method forecasts a substantial number of trips, well beyond what the Tidal Wave development in Chesterfield is generating. Based on our experience, the ITE forecast grossly overstates the trip generation potential of the proposed development. The actual trip generation of the Chesterfield site is consistent with our expectations for the proposed development. Therefore, the trip generation method for this traffic impact study will utilize the second method based on the Chesterfield site.

The trip generation forecast for the proposed development is summarized in **Table 2**. Despite fewer proposed vehicle fueling positions, the actual trips counted at the Chesterfield site were applied unadjusted in **Table 2** in an effort to be conservative. In total, the proposed development would generate 324 trips during the weekday morning peak hour, 317 trips during the weekday afternoon peak hour, and 294 trips during the Saturday midday peak hour.

**Table 2: Trip Generation Forecast – Proposed Development**

Land Use	Size	Weekday AM Peak Hour			Weekday PM Peak Hour			Saturday Midday Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
Method 2: Similar Site	11,000 SF	157	167	324	156	161	317	153	141	294
	Pass-By Trips	100	100	200	89	89	178	59	59	118
	New Trips	57	67	124	67	72	139	94	82	176

It should be emphasized that not all of these trips would be new to the study area road system. Rather, a portion of the trips would be attracted to the proposed development as part of an existing trip to another destination. Studies indicate that convenience-oriented uses such as gas stations, car washes, convenience stores, and coffee shops attract a sizable amount of “pass-by trips”. These trips are already traveling past the site on the adjoining public roadways and would turn into the site to patronize the proposed uses before continuing on to a different destination. The trips would generate turning



movements at the proposed site access driveways but would not represent new trips to Lindbergh Boulevard or East Watson Road.

Pass-by trip percentages for Land Use Code: 945 Gas/Service Station with Convenience Market obtained from Trip Generation Handbook, Third Edition, published by ITE were applied for the weekday morning and weekday afternoon peak hours, as summarized in **Table 3**. ITE does not provide pass-by trip percentages for a comparable use for the Saturday midday peak hour, so 40 percent was assumed.

**Table 3: Pass-By Trip Percentages – Proposed Development**

<i>Period</i>	<i>Pass-By Percentage</i>
Weekday AM Peak Hour	62%
Weekday PM Peak Hour	56%
Saturday Midday Peak Hour	40%

**Directional Distribution**

The site's new trips will be assigned to the study area roadways in accordance with an anticipated directional distribution that reflects prevailing traffic patterns as well as the expected market area of the proposed uses. The directional distribution percentages are presented in **Table 4**.

**Table 4: Directional Distribution Percentages – Proposed Development**

<i>Origin/Destination</i>	<i>Percentage</i>
To/From North via Lindbergh Boulevard	35%
To/From South via Lindbergh Boulevard	35%
To/From West via Rott Road	15%
To/From East via East Watson Road	15%

We appreciate your review of the preceding traffic impact study assumptions. We look forward to receiving your comments and/or consensus on this information as soon as possible. Please contact me at [cbeard@lochgroup.com](mailto:cbeard@lochgroup.com) or 314-446-5400 should any questions arise during your review.