

# MEMO

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**From:** Julie M. Kroll, PE, PTOE  
Fleis & VandenBrink

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**Date:** March 23, 2022

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**Re:** 1360 Walton Boulevard, Starbucks Development  
Rochester Hills, Michigan  
Trip Impact Study Addendum

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## INTRODUCTION

This report presents additional information as requested by the City of Rochester Hills in their review of the F&V Traffic Impact Study (TIS) dated February 10, 2022, the results of a Traffic Impact Study (TIS) for the proposed Starbucks Coffee Shop with drive-through on Walton Boulevard in Rochester Hills, Michigan. The two comments provided by the City for clarification are summarized below:

1. Provide further information and potential mitigation measures regarding Starbucks peak hour operations as they correspond to the peak hour operations of the Rochester High School site drive. Specifically, shared center left-turn utilized by both Rochester High School and the proposed Starbucks Drive.
2. Provide a queuing study using comparable Starbucks data as there is still a concern that Traffic will back up onto Walton Blvd.

## ROCHESTER HIGH SCHOOL DRIVEWAY IMPACTS

Rochester High School daily bell schedule is 7:30 AM-2:30PM. The peak period for ingress in the morning is the 30 minutes before class starts and the 15 minutes before and after the final bell. The periods are summarized in **Table 1**.

**Table 1: Adjacent Street and Site Peak Hours**

Site Location	AM Peak Period	School PM	PM
Rochester High School	7:00 AM-7:30 AM	2:15 PM-2:30 PM	4:00 PM-6:00 PM
Peak Hours of Adj. Street	7:00 AM-8:00 AM	2:15 PM-3:15 PM	4:00 PM-6:00 PM
Starbucks/ITE Peak Hours	5:30 AM-9:30 AM	1:00 PM-2:00 PM	4:00 PM-6:00 PM

Starbucks peak characteristics are inclusive from 5:30AM to 9:30AM, therefore the peak hour of the adjacent street for AM and PM is consistent with the peaking characteristics for Starbucks. To evaluate the School PM peak hours the ITE peak hour of the generator was used, which generally occurs from 1:00 PM-2:00PM. The ITE daily distribution data for this land use code is attached.

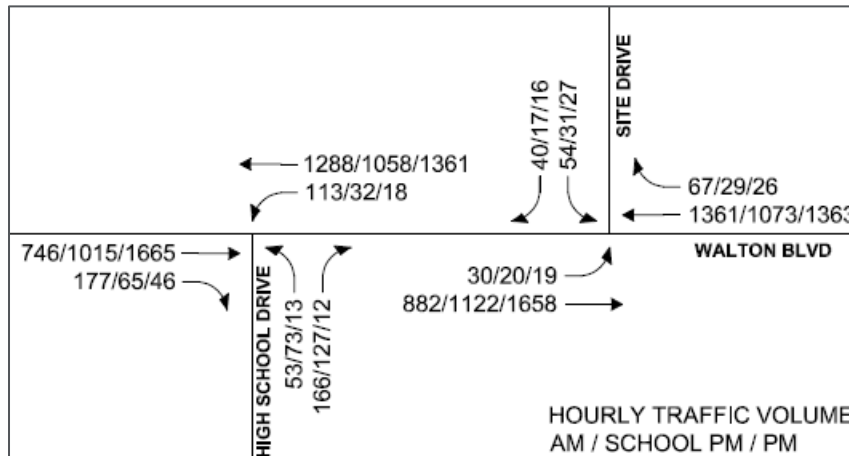
The number of weekday, AM, School PM and PM peak hour vehicle trips that would be generated by the proposed development plan were forecast based on data published by ITE in the *Trip Generation Manual, 11<sup>th</sup> Edition*. The results of the analysis are summarized in **Table 2**.

**Table 2: Site Trip Generation**

Land Use	ITE Code	Amount	Units	Average Daily Traffic (vpd)	AM Peak Hour (vph)			School PM Peak Hour (vph)			PM Peak Hour (vph)		
					In	Out	Total	In	Out	Total	In	Out	Total
Coffee Shop with Drive-Through	937	2,219	SF	1,184	97	94	191	49	48	97	44	43	87
<i>Pass-By</i>	50% AM, 55% PM			622	48	48	96	24	25	49	24	24	48
<b>New Trips</b>				<b>562</b>	<b>49</b>	<b>46</b>	<b>95</b>	<b>25</b>	<b>23</b>	<b>48</b>	<b>20</b>	<b>19</b>	<b>39</b>

The vehicular trips that would be generated by the proposed development were assigned to the study roads based on the proposed site access plan, the existing peak hour traffic patterns in the adjacent roadway network, and the methodologies published by ITE. The trips generated by the proposed development were distributed to the adjacent roadway network to calculate the projected operations and vehicle queueing. The trip generation at the site driveway during the AM, School PM and PM peak hour are shown in the figure below.

**Figure 1: Future Traffic Volumes**



The peak period queueing at the Rochester High School Drive and the proposed site driveway are summarized in **Table 3**. The result of this analysis shows that there is 20-70 feet available to accommodate vehicle shift tapers during the peak periods.

**Table 3: Back-to-Back Left-turn Lane Storage Evaluation (ft)**

Peak Period	Rochester High School Drive Queue Length 95 <sup>th</sup> %	Starbucks Drive Queue Length 95 <sup>th</sup> %	Total Queue Length	Shared Storage Length	Difference
AM	82	49	131	150	19
School PM	44	35	79	150	71
PM Peak Hour	41	44	85	150	65

F&V performed field reviews and data collection during the peak periods. The field reviews showed that the school traffic backs up on Walton Blvd. past the site driveway, as vehicles internal to the site are queued onto the adjacent street. This condition occurs ONLY on school days and is limited to 2% of daily traffic on Walton Blvd. for a window of approximately 20 minutes before school starts in the morning and 20 minutes before school dismisses in the afternoon. Throughout the remainder of the day, the vehicle queueing in the center left-turn lane does not impact the operations of the adjacent site driveways. During the periods of the year when school is not in session, i.e., weekends, Holidays, Summer Break, etc. there is NO impact from the High School operations.

## STARBUCKS QUEUING

F&V reviewed data collection options at the existing stores in Rochester Hills, however through discussions with Starbucks, there are limitations with that methodology as summarized in correspondence below.

*There are multiple site plan and size constraint inconsistencies between stores that would impact average drive-through traffic flow, including; distance to menu board less than 5th car; smaller building size / atypical bar layout, restricted ingress/egress. Additionally, due to current Covid-related issues (staffing, reduced hours, increased drive-through volumes), there is also little weekly consistency between individual stores. The proposed site plan for this site exceeds the drive-through stack at most of our current free-standing stores in the market, in addition to providing larger building footprint for optimal Bar and back of house layout. All elements that assist in drive through speed efficiencies. Starbucks Coffee Company | Midwest Region*

Therefore, the drive-through queuing analysis performed for this site shows that there is adequate queuing to accommodate the proposed operations without impacting the adjacent street traffic. Additional documentation is attached regarding drive-through storage recommendations and is consistent with analysis provided in TIS.

## CONCLUSIONS

- The proposed site operations and layout can accommodate the projected vehicle queuing generated by the proposed Starbucks.

Any questions related to this memorandum, study, analyses, and results should be addressed to Fleis & VandenBrink.



I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Michigan.

A handwritten signature in blue ink that reads "Julie M. Kroll".

Digitally signed by Julie M. Kroll  
Date: 2022.03.23 10:26:34  
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