



# TRAFFIC IMPACT STUDY

## PROPOSED TACO BELL WITH DRIVE-THRU SERVICE

2720 U.S. Route 130  
Township of North Brunswick,  
Middlesex County, New Jersey

Prepared For:  
Yum & Chill Restaurant Group

March 29, 2022

SE&D Job No. PRI-220017



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Intersection of U.S. Route 130, Davidson's Mill Road, & Finnegan's Lane

## INTRODUCTION

This Traffic Impact Study was prepared to investigate the potential impacts of the proposed Taco Bell with drive-thru service on the adjacent roadway network. The subject property is located at the northeasterly corner of the intersection of U.S. Route 130, Davidson's Mill Road, and Finnegan's Lane in the Township of North Brunswick, Middlesex County, New Jersey. The site location is shown on appended **Figure 1**.

The subject property is designated as Block 224, Lot 1 on the Township of North Brunswick Tax Map. The site has approximately 201 feet of frontage along U.S. Route 130 and approximately 128 feet of frontage along Davidson's Mill Road. The existing site is occupied by a 3,270-square-foot BP Gas mini mart with fuel sales. Access is presently provided via one (1) right-in/right-out driveway along U.S. Route 130 and one (1) full-movement driveway along Davidson's Mill Road. Under the proposed development program, the existing structures would be razed and a 2,246-square-foot Taco Bell with drive-thru service would be constructed. Access is proposed via one (1) right-in/right-out driveway along U.S. Route 130 and one (1) egress-only driveway along Davidson's Mill Road.

## METHODOLOGY

Stonefield Engineering & Design, LLC has prepared this Traffic Impact Study in accordance with the recommended guidelines and practices outlined by the Institute of Transportation Engineers (ITE) within Transportation Impact Analyses for Site Development. A detailed field investigation was performed to assess the existing conditions of the adjacent roadway network. A data collection effort was completed to identify the existing traffic volumes at the study intersections to serve as a base for the traffic analyses. Capacity analysis, a procedure used to estimate the traffic-carrying ability of roadway facilities over a range of defined operating conditions, was performed using the Highway Capacity Manual, 6<sup>th</sup> Edition (HCM) and the Synchro II Software for all study conditions to assess the roadway operations.

For an unsignalized intersection, Level of Service (LOS) A indicates operations with delay of less than 10 seconds per vehicle, while LOS F describes operations with delay in excess of 50 seconds per vehicle. For a signalized intersection, LOS A indicates operations with delay of less than 10 seconds per vehicle, while LOS F describes operations with delay in excess of 80 seconds per vehicle. The Technical Appendix contains the Highway Capacity Analysis Detail Sheets for the study intersections analyzed in this assessment. The traffic signal timing utilized within the signalized analysis is based on timing directives provided by the New Jersey Department of Transportation (NJDOT).

## 2022 EXISTING CONDITION

### 2022 EXISTING ROADWAY CONDITIONS

The proposed Taco Bell with drive-thru service is located at the northeasterly corner of the intersection of U.S. Route 130, Davidson's Mill Road, and Finnegan's Lane in the Township of North Brunswick, Middlesex County, New Jersey. The subject property is designated as Block 224, Lot 1 on the Township of North Brunswick Tax Map. The site has approximately 201 feet of frontage along U.S. Route 130 and approximately 128 feet of frontage along Davidson's Mill Road. Land uses in the area are a mix of residential, commercial, and industrial uses.

U.S. Route 130 is classified as an Urban Principal Arterial roadway with a general north-south orientation and is under the jurisdiction of the NJDOT. Along the site frontage, the roadway provides two (2) lanes of travel in each direction divided by a grass median with additional lanes provided at key intersections to facilitate turning maneuvers. U.S. Route 130 has a posted speed limit of 55 mph. Curb and sidewalk are not provided, shoulders are provided along both sides of the roadway, and on-street parking is not permitted. U.S. Route 130 provides north-south mobility throughout Middlesex County and provides access to U.S. Route 1 to the north and NJSH Route 32 to the south with access to commercial and industrial uses along its length.

Davidson's Mill Road is classified as an Urban Major Collector roadway with a general east-west orientation and is under the jurisdiction of the Township of North Brunswick. Along the site frontage, the roadway provides one (1) lane of travel in each direction and has a posted speed limit of 35 mph. Curb is intermittently provided along both sides of the roadway, sidewalk and shoulders not provided, and on-street parking is not permitted. Davidson's Mill Road provides east-west mobility throughout North Brunswick and surrounding municipalities with its westerly terminus at U.S. Route 130 for access to a mix of uses along its length.

Finnegan's Lane is a local roadway with a general east-west orientation and is under the jurisdiction of Township of North Brunswick. In the vicinity of the site, the roadway provides one (1) lane of travel in each direction divided by a grass median with additional lanes provided at its intersection with U.S. Route 130 to facilitate turning maneuvers. Curb, sidewalk, and shoulders are not provided, and on-street parking is not permitted. Finnegan's Lane terminates approximately 2,200 feet west of its intersection with U.S. Route 130 and provides access to Deer Brook Village residential community and industrial uses along its length.

U.S. Route 130, Davidson's Mill Road, and Finnegan's Lane intersect to form a four (4)-leg intersection controlled by a three (3)-phase traffic signal operating on a 90-second background cycle. The eastbound approach of Finnegan's Lane provides one (1) shared left-turn/through lane and one (1) exclusive right-turn lane and the westbound approach of Davidson's Mill Road provides one (1) shared left-turn/through/right-turn

lane. The northbound and southbound approaches of U.S. Route 130 each provide one (1) exclusive left-turn lane, one (1) exclusive through lane, and one (1) shared through/right-turn lane. It is noted the receiving lane and approach lanes of Finnegan's Lane are separated by an approximately 45-foot-wide grass median. Crosswalk and pedestrian signals are provided across all legs of the intersection.

### 2022 EXISTING TRAFFIC VOLUMES

Turning movement counts were collected during the typical weekday midday and weekday evening time periods to evaluate existing traffic conditions and identify the specific hours when traffic activity on the adjacent roadways is at a maximum and could be potentially impacted by the development of the site. Turning movement counts were collected at the intersection of U.S. Route 130, Davidson's Mill Road, and Finnegan's Lane. Specifically, turning movement counts were conducted on the following dates and during the following times:

- ◆ Wednesday, March 23, 2022, from 11:00 a.m. to 2:00 p.m. and from 4:00 p.m. to 7:00 p.m.

The study time periods were chosen as they are representative of the peak periods of both the adjacent roadway network and the proposed development. The traffic volume data was collected and analyzed to identify the design peak hour in accordance with HCM and ITE guidelines. Based on the review of the count data the weekday midday peak hour occurred from 1:00 p.m. to 2:00 p.m. and the weekday evening peak hour occurred from 4:45 p.m. to 5:45 p.m. The Technical Appendix contains a summary of the turning movement count data. The 2022 Existing weekday midday and weekday evening peak-hour volumes are summarized on appended **Figure 2**.

### 2022 EXISTING LOS/CAPACITY ANALYSIS

A Level of Service and Volume/Capacity analysis was conducted for the 2022 Existing Condition during the weekday midday and weekday evening peak hours at the study intersection. Under the existing condition, the signalized intersection of U.S. Route 130, Davidson's Mill Road, and Finnegan's Lane is calculated to operate at overall Level of Service B during the weekday midday peak hour and at overall Level of Service C during the weekday evening peak hour. The northbound and southbound through approaches are calculated to operate at Level of Service C or better during each of the peak hours studied. The remaining approaches are calculated to operate at Level of Service D or better during each of the peak hours studied with the exception of the northbound left-turn approach which is calculated to operate at Level of Service E during the weekday midday peak hour.

## 2024 NO-BUILD CONDITION

### BACKGROUND GROWTH

The 2022 Existing Condition traffic volume data was grown to a future horizon year of 2024, which is a conservative estimate for when the proposed Taco Bell with drive-thru service is expected to be fully constructed. In accordance with industry guidelines, the existing traffic volumes at the study intersections were increased by 1.00% annually for two (2) years to generate the 2024 Base Traffic Volumes. These volumes are summarized on appended **Figure 3**. The 1.00% background growth rate was obtained from the NJDOT Annual Background Growth Rate Table.

### OTHER PLANNED DEVELOPMENT PROJECTS

To evaluate the future traffic conditions, it is important to consider the potential site-generated traffic of other projects that could influence the traffic volume at the study intersections. Other planned development projects include those that are either in the entitlement process or have recently been approved for building permits in proximity to the proposed development. Based on consultations with North Brunswick's Municipal Clerk, Lisa Russo, the following developments are anticipated to impact traffic volumes within the study area:

- ◆ Warehouse Building – 235,787-square-foot warehouse building located along the easterly side of U.S. Route 130 directly adjacent north to the site.

Appended **Figure 4** illustrates the site-generated traffic associated with the warehouse building project assigned to the study area network.

### 2024 NO-BUILD TRAFFIC VOLUMES

The site-generated trips associated with the warehouse building project were added to the 2024 Base Traffic Volumes to calculate the 2024 No-Build Traffic Volumes for the weekday midday and weekday evening peak hours. These volumes are summarized on appended **Figure 5**.

### 2024 NO-BUILD LOS/CAPACITY ANALYSIS

A Level of Service and Volume/Capacity analysis was also conducted for the 2024 No-Build Condition during the weekday midday and weekday evening peak hours at the study intersection. The signalized intersection of U.S. Route 130, Davidson's Mill Road, and Finnegan's Lane is calculated to operate generally consistent with the findings of the Existing Condition during each of the peak hours studied.

**2024 BUILD CONDITION**

The site-generated traffic volume of the proposed Taco Bell with drive-thru service was estimated to identify the potential impacts of the project. For the purpose of this analysis, a complete project “build out” is assumed within two (2) years of the preparation of this study.

TRIP GENERATION

Trip generation projections for the existing BP Gas mini mart with fuel sales and proposed Taco Bell with drive-thru service were prepared utilizing ITE’s Trip Generation Manual, 11<sup>th</sup> Edition. Trip generation rates associated with Land Use 945 “Convenience Store/Gas Station” and Land Use 934 “Fast-Food Restaurant with Drive-Through Window” were cited for the existing 3,270-square-foot BP Gas mini mart with fuel sales and proposed 2,246-square-foot Taco Bell with drive-thru service. It is noted ITE does not provide data for the weekday midday peak hour for the Land Uses and as such, trip generation rates associated with the weekday evening peak hour of the generator were utilized. To provide a conservative analysis no trip reduction for the existing on-site use was applied. **Table I** provides the weekday midday and weekday evening peak-hour trip generation volumes associated with the existing site and proposed development.

**TABLE I – PROPOSED TRIP GENERATION**

Land Use	Weekday Midday Peak Hour			Weekday Evening Peak Hour		
	Enter	Exit	Total	Enter	Exit	Total
<i>Existing Use</i> 3,270 SF Convenience Store/Gas Station <i>ITE Land Use 945</i>	92	92	184	89	89	178
<i>Proposed Use</i> 2,246 SF Fast-Food Restaurant with Drive-Through Window <i>ITE Land Use 934</i>	58	57	115	38	36	74
<b>Trip Difference</b>	<b>-34</b>	<b>-35</b>	<b>-69</b>	<b>-51</b>	<b>-53</b>	<b>-104</b>

As stated within Chapter 10 of ITE’s Trip Generation Handbook, 3<sup>rd</sup> Edition, there are instances when the total number of trips generated by a site is different from the amount of new traffic added to the street system by the generator. Fast-food restaurants with drive-thru service are specifically located on or adjacent to busy streets to attract motorists already on the roadway. Therefore, the proposed development would be expected to attract a portion of its trips from the traffic passing the site on the way from an origin to an ultimate destination. These trips do not add new traffic to the adjacent roadway system and are referred to as pass-by trips.



Based upon the published ITE data for Land Use 934 “Fast-Food Restaurant with Drive-Through Window,” 55% of the site-generated traffic during the weekday evening peak period is comprised of pass-by traffic. It is noted that the Trip Generation Manual, 11<sup>th</sup> Edition, does not contain data for the weekday midday peak period for the proposed use. However, it is logical that an interaction comparable to the weekday evening peak period would occur during the weekday midday peak period. As such, the weekday evening pass-by rate has been utilized for the weekday midday peak period. At the site driveways, the calculated number of pass-by trips is shown as a negative number at the through movement as the vehicles are temporarily diverted from the through travel stream into and out of the site access point. **Table 2** shows the additional site generated traffic for the proposed development after applying the appropriate trip reductions to account for pass-by traffic.

**TABLE 2 – PROPOSED TRIP GENERATION – NEW & PASS-BY TRIPS**

Land Use	Weekday Midday Peak Hour			Weekday Evening Peak Hour		
	Enter	Exit	Total	Enter	Exit	Total
“New” Trips	27	26	53	18	16	34
“Pass-By” Trips	31	31	62	20	20	40
<b>Total</b>	<b>58</b>	<b>57</b>	<b>115</b>	<b>38</b>	<b>36</b>	<b>74</b>

The proposed development is expected to generate 53 “new” trips during the critical weekday midday peak hour without applying a trip reduction for the existing use on site. Based on Transportation Impact Analysis for Site Development published by ITE, a trip increase of less than 100 vehicle trips would likely not change the level of service of the adjacent roadway system or appreciably increase the volume-to-capacity ratio of an intersection approach. As such, the proposed development is not anticipated to significantly impact the operations of the adjacent roadway network.

TRIP ASSIGNMENT/DISTRIBUTION

The trips generated by the proposed development were distributed according to existing travel patterns along the adjacent roadways, the location of residential neighborhoods proximate to the site, and the access management plan of the site. The methodology used to develop the “new” trip distribution assumes that the trip distribution is proportional to population densities and travel distance from the site. Based on the access management plan of the site, median divide nature of U.S. Route 130, and anticipated driver behavior, a larger portion of the “pass-by” trips were assigned along U.S. Route 130 northbound. The “New” Site-Generated Traffic Volumes are illustrated on **Figure 6** and the “Pass-By” Site-Generated Traffic Volumes expected to access the site are depicted on **Figure 7**.

2024 BUILD TRAFFIC VOLUMES

The site-generated trips were added to the 2024 No-Build Traffic Volumes to calculate the 2024 Build Traffic Volumes and are shown on appended **Figure 8**.

**2024 BUILD LOS/CAPACITY ANALYSIS**

A Level of Service and Volume/Capacity analysis was also conducted for the 2024 Build Condition during the weekday midday and weekday evening peak hours at the study intersection and proposed site driveways. **Tables 3 through 6** compare the Existing, No-Build, and Build Conditions Level of Service and delay values.

The signalized intersection of U.S. Route 130, Davidson’s Mill Road, and Finnegan’s Lane is calculated to operate generally consistent with the findings of the No-Build Condition at overall Level of Service B during the weekday midday peak hour and at overall Level of Service C during the weekday evening peak hour. Each of the approaches are calculated to operate at Level of Service D or better during each of the peak hours studied with the exception of the northbound left-turn approach which is calculated to operate at Level of Service E during the weekday midday peak hour.

The turning movements at the proposed right-in/right-out driveway along U.S. Route 130 are calculated to operate at Level of Service C or better during each of the peak hours studied. The turning movements at the proposed egress-only driveway along Davidson’s Mill Road are calculated to operate at Level of Service A during each of the peak hours studied. The 95<sup>th</sup> percentile queue is calculated to be less than one (1) vehicle at both driveway approaches during the critical peak hour which can be accommodated on site without impacting circulation throughout the site or blocking parking spaces.

**COMPARATIVE LEVEL OF SERVICE (DELAY) TABLES**

**U.S. ROUTE 130, DAVIDSON’S MILL ROAD, & FINNEGAN’S LANE**

EB (Eastbound) approach is the Finnegan’s Lane approach  
WB (Westbound) approach is the Davidson’s Mill Road approach  
NB (Northbound) and SB (Southbound) approaches are the U.S. Route 130 approaches  
X (n) = Level of Service (seconds of delay)

**TABLE 3 – WEEKDAY MIDDAY PEAK HOUR**

Lane Group	2022 Existing	2024 No-Build	2024 Build
EB Left/Through	D (39.8)	D (40.4)	D (38.3)
EB Right	D (35.2)	C (35.0)	C (33.6)
WB Left/Through/Right	D (38.5)	D (39.3)	D (41.5)
NB U-Turn/Left	E (68.1)	E (68.1)	E (68.1)
NB Through/Right	B (11.8)	B (12.8)	B (14.7)
SB U-Turn/Left	D (40.8)	D (42.0)	D (43.8)
SB Through/Right	A (8.6)	A (8.8)	A (9.7)
<b>Intersection</b>	<b>B (13.9)</b>	<b>B (14.8)</b>	<b>B (16.6)</b>

**TABLE 4 – WEEKDAY EVENING PEAK HOUR**

Lane Group	2022 Existing	2024 No-Build	2024 Build
EB Left/Through	D (41.5)	D (41.5)	D (40.4)
EB Right	C (34.4)	C (34.0)	C (33.3)
WB Left/Through/Right	D (40.4)	D (40.9)	D (42.1)
NB U-Turn/Left	D (46.2)	D (46.2)	D (46.2)
NB Through/Right	C (28.1)	D (35.6)	D (44.0)
SB U-Turn/Left	D (41.0)	D (42.7)	D (43.6)
SB Through/Right	B (10.4)	B (10.8)	B (11.4)
<b>Intersection</b>	<b>C (22.7)</b>	<b>C (27.0)</b>	<b>C (31.9)</b>

**U.S. ROUTE 130 & RIGHT-IN/RIGHT-OUT DRIVEWAY**

WB (Westbound) approach is the site driveway approach  
X (n) = Level of Service (seconds of delay)

**TABLE 5 – 2024 BUILD CONDITION**

Lane Group	Weekday Midday Peak Hour	Weekday Evening Peak Hour
WB Right	B (13.3)	C (21.2)

**DAVIDSON'S MILL ROAD & SITE DRIVEWAY**

SB (Southbound) approach is the site driveway approach  
X (n) = Level of Service (seconds of delay)

**TABLE 6 – 2024 BUILD CONDITION**

Lane Group	Weekday Midday Peak Hour	Weekday Evening Peak Hour
SB Left/Right	A (9.6)	A (9.5)

**SITE CIRCULATION/PARKING SUPPLY**

A review was conducted of the proposed Taco Bell with drive-thru service using the Site Plan prepared by East Point Engineering, dated January 24, 2022. In completing this review, particular attention was focused on the site access, circulation, and parking supply.

Access is proposed via one (1) right-in/right-out driveway along U.S. Route 130 and one (1) egress-only driveway along Davidson's Mill Road. The building would be centrally located with the main drive aisle and customer parking area located to the west of the building and the employee parking area located to the east of the building. Vehicular circulation throughout the site would be provided via one-way drive aisles with a minimum width of 20 feet. The drive-thru lane would be located along the easterly side of the building with the queue extending to the south and then wrapping around the building back to the north. The drive-thru lane would be able to accommodate seven (7) vehicles without blocking internal drive aisles or parking spaces

and an additional eight (8) vehicles on site without extending back onto U.S. Route 130 for a total available on-site queue of 15 vehicles. The drive-thru lane would be 11-feet-wide with a 14-foot-wide by-pass lane directly adjacent east. The trash enclosure would be located in the northeasterly corner of the site adjacent to the employee parking area.

Regarding the parking requirements for the proposed development, the Township of North Brunswick Ordinance requires one (1) parking space for every 200 square feet of gross floor area for restaurants, taverns, cafeterias, and diners. For the proposed 2,246-square-foot Taco Bell with drive-thru service, this equates to 11 required spaces. The site would provide 24 total parking spaces, inclusive of two (2) ADA accessible parking spaces and four (4) employee parking spaces, which meets the parking requirement and would be sufficient to support this project's parking demand. The angled parking spaces would each provide a clear nine (9)-foot-wide by 18-foot-deep area space in accordance with the Township of North Brunswick Ordinance and industry standards.

As per P.L. 2021, c.171 (C.40:55D-66.18 et al.), all non-residential projects involving a parking garage or parking lot, except retailers with fewer than 25 parking spaces, must provide parking spaces pre-wired for electric vehicle charging stations ("make-ready") according to the following requirements:

- 1 make-ready space if the garage or lot has 50 or fewer spaces;
- 2 make-ready spaces if the garage or lot has between 51 and 75 spaces;
- 3 make-ready spaces if the garage or lot has between 76 and 100 spaces;
- 4 make-ready spaces if the garage or lot has between 101 and 150 spaces (at least one of which must be accessible for people with disabilities).
- At least 4% of the total parking spaces if the garage or lot has over 150 spaces (at least 5% of which must be accessible for people with disabilities).

For the proposed parking supply of 24 parking spaces, this equates to zero (0) make-ready spaces, however, the site would provide two (2) make-ready spaces. The electric vehicle requirements consider electric vehicle spaces as a minimum of two (2) parking spaces for the purpose of satisfying parking requirements, up to a 10% reduction of total requirement. As such, the development plan would be considered to provide 26 (24 + 2) total parking spaces, whereas 11 are required.

Regarding the queueing supply for the Taco Bell with drive-thru service, based on observations performed by Stonefield at Taco Bell's Milltown location the average time a drive-thru customer spends between placing their order and picking up their order is 267 seconds. As there are four (4) vehicle positions between the ordering station and the pick-up window, on average customer can be served every 67 seconds. Therefore, the Taco Bell drive-thru can process approximately 54 vehicles per hour, without significant queuing. The maximum number of vehicles accessing the site during the busiest hour is 57 vehicles (of which some will be in-store customers). Further, based on a Poisson arrival distribution and assuming all vehicles utilize the drive-

thru, the 85<sup>th</sup> percentile queue length would be approximately seven (7) vehicles as such, the proposed stacking space for seven (7) vehicles would generally be sufficient to accommodate the queue without impacting on-site drive aisles or parking spaces.

## CONCLUSIONS

This report was prepared to examine the potential traffic impact of the proposed Taco Bell with drive-thru service. The analysis findings, which have been based on industry-standard guidelines, indicate that the proposed development would not have a significant impact on the traffic operations of the adjacent roadway network. The site-generated trips of the proposed development would consist largely of “pass-by” trips, as opposed to new vehicles on the roadway, due to the land use, location, and the access management plan. To provide a conservative analysis, the trip generation of the existing on-site use was not considered, however, it is noted the proposed development plan would likely result in a reduction of site generated traffic. The site driveways and on-site layout have been designed to provide for effective access to and from the subject property. Based on the Township of North Brunswick Ordinance parking requirements, the parking supply would be sufficient to support this project. Based on observations performed by Stonefield at a similar nearby site and Poisson distribution analysis, the proposed stacking space would generally be sufficient to accommodate the queue without impacting on-site drive aisles or parking spaces.







**TECHNICAL APPENDIX**

**LEVEL OF SERVICE/AVERAGE CONTROL DELAY CRITERIA**

## LEVEL OF SERVICE /AVERAGE CONTROL DELAY CRITERIA

The ability of a roadway to effectively accommodate traffic demand is determined through an assessment of the volume-to-capacity ratio, delay and Level of Service of the lane group and/or intersection. The volume-to-capacity ratio is the ratio of traffic flow rate to capacity for a given transportation facility. As defined within the Highway Capacity Manual, 6<sup>th</sup> Edition (HCM), intersection delay is the total additional travel time experienced by drivers, passengers, or pedestrians as a result of control measures and interaction with other users of the facility, divided by the volume departing from the corresponding cross section of the facility. Level of service is a qualitative measure describing operational conditions within a traffic stream, based on service measures such as speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience.

For an unsignalized intersection, LOS A indicates operations with delay less than 10 seconds per vehicle, while LOS F describes operations with delay in excess of 50 seconds per vehicle. For a signalized intersection, LOS A indicates operations with delay less than 10 seconds per vehicle and LOS F denotes operations with delay in excess of 80 seconds per vehicle.

	Level Of Service (LOS)	Signalized Delay Range (average control delay in sec/veh)	Unsignalized Delay Range (average control delay in sec/veh)
	A	≤10	≤10
	B	>10 and ≤20	>10 and ≤15
	C	>20 and ≤35	>15 and ≤25
	D	>35 and ≤55	>25 and ≤35
	E	>55 and ≤80	>35 and ≤50
	F	>80	>50

Source: Highway Capacity Manual, 6<sup>th</sup> Edition



**TURNING MOVEMENT COUNT DATA**

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Intersection of Finnegans Lane/Davidson's Mill Road (E/W)  
and U.S. Route 130 (N/S)  
North Brunswick, Middlesex County, New Jersey  
Wednesday, March 23, 2022

File Name : PRI-220017  
Site Code : 00220017  
Start Date : 3/23/2022  
Page No : 1

### Groups Printed- Auto - HV - B/SB

Start Time	Finnegans Lane Eastbound					Davidson's Mill Road Westbound					U.S. Route 130 Northbound					U.S. Route 130 Southbound					Int. Total
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	
11:00 AM	16	9	1	1	27	11	1	7	6	25	1	167	9	1	178	7	177	11	3	198	428
11:15 AM	11	2	2	4	19	11	6	4	2	23	2	201	3	2	208	9	169	11	1	190	440
11:30 AM	11	3	0	2	16	8	3	5	3	19	2	179	9	2	192	10	172	7	0	189	416
11:45 AM	13	4	0	6	23	14	5	4	3	26	1	193	9	3	206	14	174	4	1	193	448
<b>Total</b>	<b>51</b>	<b>18</b>	<b>3</b>	<b>13</b>	<b>85</b>	<b>44</b>	<b>15</b>	<b>20</b>	<b>14</b>	<b>93</b>	<b>6</b>	<b>740</b>	<b>30</b>	<b>8</b>	<b>784</b>	<b>40</b>	<b>692</b>	<b>33</b>	<b>5</b>	<b>770</b>	<b>1732</b>
12:00 PM	12	8	1	1	22	7	1	5	7	20	2	202	9	0	213	12	202	8	0	222	477
12:15 PM	11	4	0	1	16	8	2	4	1	15	2	193	10	1	206	10	192	7	2	211	448
12:30 PM	9	3	0	1	13	7	4	6	4	21	2	198	7	1	208	8	210	9	2	229	471
12:45 PM	8	2	0	2	12	7	2	3	3	15	1	204	15	0	220	15	201	4	3	223	470
<b>Total</b>	<b>40</b>	<b>17</b>	<b>1</b>	<b>5</b>	<b>63</b>	<b>29</b>	<b>9</b>	<b>18</b>	<b>15</b>	<b>71</b>	<b>7</b>	<b>797</b>	<b>41</b>	<b>2</b>	<b>847</b>	<b>45</b>	<b>805</b>	<b>28</b>	<b>7</b>	<b>885</b>	<b>1866</b>
01:00 PM	16	6	1	3	26	10	3	10	1	24	0	207	8	2	217	15	211	8	2	236	503
01:15 PM	14	4	1	3	22	9	2	12	9	32	2	254	5	1	262	10	193	8	0	211	527
01:30 PM	17	4	1	1	23	17	4	12	6	39	4	228	9	2	243	18	266	1	1	286	591
01:45 PM	8	3	3	0	14	14	4	4	1	23	2	221	8	1	232	11	245	10	1	267	536
<b>Total</b>	<b>55</b>	<b>17</b>	<b>6</b>	<b>7</b>	<b>85</b>	<b>50</b>	<b>13</b>	<b>38</b>	<b>17</b>	<b>118</b>	<b>8</b>	<b>910</b>	<b>30</b>	<b>6</b>	<b>954</b>	<b>54</b>	<b>915</b>	<b>27</b>	<b>4</b>	<b>1000</b>	<b>2157</b>
*** BREAK ***																					
04:00 PM	18	4	2	2	26	24	4	19	4	51	0	409	12	2	423	13	326	10	3	352	852
04:15 PM	13	4	0	0	17	16	7	12	3	38	1	412	13	1	427	14	306	15	4	339	821
04:30 PM	18	5	3	1	27	18	0	12	3	33	2	391	15	3	411	14	297	12	0	323	794
04:45 PM	19	3	0	3	25	13	5	13	0	31	0	435	30	7	472	21	272	14	0	307	835
<b>Total</b>	<b>68</b>	<b>16</b>	<b>5</b>	<b>6</b>	<b>95</b>	<b>71</b>	<b>16</b>	<b>56</b>	<b>10</b>	<b>153</b>	<b>3</b>	<b>1647</b>	<b>70</b>	<b>13</b>	<b>1733</b>	<b>62</b>	<b>1201</b>	<b>51</b>	<b>7</b>	<b>1321</b>	<b>3302</b>
05:00 PM	20	6	0	0	26	18	7	11	0	36	1	446	27	3	477	15	334	7	0	356	895
05:15 PM	14	3	0	1	18	13	7	10	3	33	3	451	26	3	483	12	265	11	1	289	823
05:30 PM	13	5	2	2	22	14	5	12	1	32	1	412	11	2	426	23	341	12	2	378	858
05:45 PM	14	2	0	1	17	22	6	14	2	44	3	395	3	4	405	14	313	11	1	339	805
<b>Total</b>	<b>61</b>	<b>16</b>	<b>2</b>	<b>4</b>	<b>83</b>	<b>67</b>	<b>25</b>	<b>47</b>	<b>6</b>	<b>145</b>	<b>8</b>	<b>1704</b>	<b>67</b>	<b>12</b>	<b>1791</b>	<b>64</b>	<b>1253</b>	<b>41</b>	<b>4</b>	<b>1362</b>	<b>3381</b>
06:00 PM	7	2	2	0	11	12	5	5	7	29	0	319	19	0	338	11	306	11	2	330	708
06:15 PM	16	2	0	0	18	17	2	6	4	29	0	305	7	0	312	16	253	5	4	278	637
06:30 PM	12	3	1	4	20	9	6	7	0	22	2	257	11	2	272	19	256	4	0	279	593
06:45 PM	8	2	0	2	12	4	1	3	7	15	1	199	4	1	205	6	234	10	2	252	484
<b>Total</b>	<b>43</b>	<b>9</b>	<b>3</b>	<b>6</b>	<b>61</b>	<b>42</b>	<b>14</b>	<b>21</b>	<b>18</b>	<b>95</b>	<b>3</b>	<b>1080</b>	<b>41</b>	<b>3</b>	<b>1127</b>	<b>52</b>	<b>1049</b>	<b>30</b>	<b>8</b>	<b>1139</b>	<b>2422</b>
<b>Grand Total</b>	<b>318</b>	<b>93</b>	<b>20</b>	<b>41</b>	<b>472</b>	<b>303</b>	<b>92</b>	<b>200</b>	<b>80</b>	<b>675</b>	<b>35</b>	<b>6878</b>	<b>279</b>	<b>44</b>	<b>7236</b>	<b>317</b>	<b>5915</b>	<b>210</b>	<b>35</b>	<b>6477</b>	<b>14860</b>
<b>Apprch %</b>	<b>67.4</b>	<b>19.7</b>	<b>4.2</b>	<b>8.7</b>		<b>44.9</b>	<b>13.6</b>	<b>29.6</b>	<b>11.9</b>		<b>0.5</b>	<b>95.1</b>	<b>3.9</b>	<b>0.6</b>		<b>4.9</b>	<b>91.3</b>	<b>3.2</b>	<b>0.5</b>		
<b>Total %</b>	<b>2.1</b>	<b>0.6</b>	<b>0.1</b>	<b>0.3</b>	<b>3.2</b>	<b>2</b>	<b>0.6</b>	<b>1.3</b>	<b>0.5</b>	<b>4.5</b>	<b>0.2</b>	<b>46.3</b>	<b>1.9</b>	<b>0.3</b>	<b>48.7</b>	<b>2.1</b>	<b>39.8</b>	<b>1.4</b>	<b>0.2</b>	<b>43.6</b>	
<b>Auto</b>	<b>276</b>	<b>90</b>	<b>11</b>	<b>34</b>	<b>411</b>	<b>289</b>	<b>92</b>	<b>192</b>	<b>76</b>	<b>649</b>	<b>21</b>	<b>6234</b>	<b>271</b>	<b>44</b>	<b>6570</b>	<b>304</b>	<b>5308</b>	<b>172</b>	<b>31</b>	<b>5815</b>	<b>13445</b>
<b>% Auto</b>	<b>86.8</b>	<b>96.8</b>	<b>55</b>	<b>82.9</b>	<b>87.1</b>	<b>95.4</b>	<b>100</b>	<b>96</b>	<b>95</b>	<b>96.1</b>	<b>60</b>	<b>90.6</b>	<b>97.1</b>	<b>100</b>	<b>90.8</b>	<b>95.9</b>	<b>89.7</b>	<b>81.9</b>	<b>88.6</b>	<b>89.8</b>	<b>90.5</b>
<b>HV</b>	<b>39</b>	<b>3</b>	<b>8</b>	<b>7</b>	<b>57</b>	<b>12</b>	<b>0</b>	<b>6</b>	<b>4</b>	<b>22</b>	<b>14</b>	<b>618</b>	<b>7</b>	<b>0</b>	<b>639</b>	<b>12</b>	<b>585</b>	<b>36</b>	<b>4</b>	<b>637</b>	<b>1355</b>
<b>% HV</b>	<b>12.3</b>	<b>3.2</b>	<b>40</b>	<b>17.1</b>	<b>12.1</b>	<b>4</b>	<b>0</b>	<b>3</b>	<b>5</b>	<b>3.3</b>	<b>40</b>	<b>9</b>	<b>2.5</b>	<b>0</b>	<b>8.8</b>	<b>3.8</b>	<b>9.9</b>	<b>17.1</b>	<b>11.4</b>	<b>9.8</b>	<b>9.1</b>
<b>B/SB</b>	<b>3</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>4</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>26</b>	<b>1</b>	<b>0</b>	<b>27</b>	<b>1</b>	<b>22</b>	<b>2</b>	<b>0</b>	<b>25</b>	<b>60</b>
<b>% B/SB</b>	<b>0.9</b>	<b>0</b>	<b>5</b>	<b>0</b>	<b>0.8</b>	<b>0.7</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0.6</b>	<b>0</b>	<b>0.4</b>	<b>0.4</b>	<b>0</b>	<b>0.4</b>	<b>0.3</b>	<b>0.4</b>	<b>1</b>	<b>0</b>	<b>0.4</b>	<b>0.4</b>

# Stonefield Engineering & Design, LLC

92 Park Avenue, Rutherford, NJ 07070  
201.340.4468 t. 201.340.4472 f.

Intersection of Finnegans Lane/Davidson's Mill Road (E/W)  
and U.S. Route 130 (N/S)  
North Brunswick, Middlesex County, New Jersey  
Wednesday, March 23, 2022

File Name : PRI-220017  
Site Code : 00220017  
Start Date : 3/23/2022  
Page No : 2

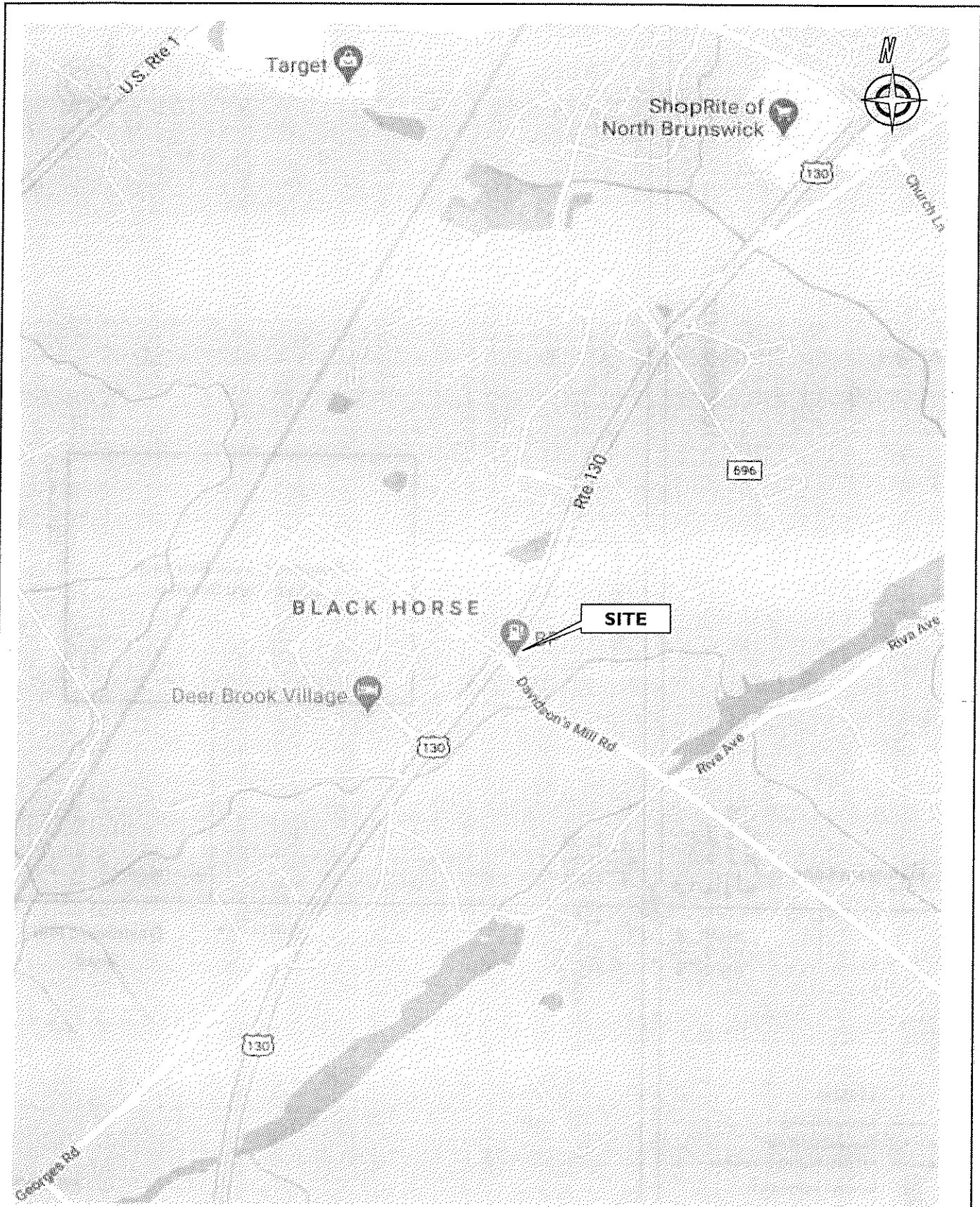
Start Time	Finnegans Lane Eastbound					Davidson's Mill Road Westbound					U.S. Route 130 Northbound					U.S. Route 130 Southbound					Int. Total
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	
Peak Hour Analysis From 11:00 AM to 03:00 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 01:00 PM																					
01:00 PM	16	6	1	3	26	10	3	10	1	24	0	207	8	2	217	15	211	8	2	236	503
01:15 PM	14	4	1	3	22	9	2	12	9	32	2	254	5	1	262	10	193	8	0	211	527
01:30 PM	17	4	1	1	23	17	4	12	6	39	4	228	9	2	243	18	266	1	1	286	591
01:45 PM	8	3	3	0	14	14	4	4	1	23	2	221	8	1	232	11	245	10	1	267	536
Total Volume	55	17	6	7	85	50	13	38	17	118	8	910	30	6	954	54	915	27	4	1000	2157
% App. Total	64.7	20	7.1	8.2		42.4	11	32.2	14.4		0.8	95.4	3.1	0.6		5.4	91.5	2.7	0.4		
PHF	.809	.708	.500	.583	.817	.735	.813	.792	.472	.756	.500	.896	.833	.750	.910	.750	.860	.675	.500	.874	.912
Auto	47	17	3	5	72	49	13	37	17	116	1	772	29	6	808	51	799	24	4	878	1874
% Auto	85.5	100	50.0	71.4	84.7	98.0	100	97.4	100	98.3	12.5	84.8	96.7	100	84.7	94.4	87.3	88.9	100	87.8	86.9
HV	8	0	3	2	13	1	0	1	0	2	7	134	1	0	142	3	115	3	0	121	278
% HV	14.5	0	50.0	28.6	15.3	2.0	0	2.6	0	1.7	87.5	14.7	3.3	0	14.9	5.6	12.6	11.1	0	12.1	12.9
B/SB	0	0	0	0	0	0	0	0	0	0	0	4	0	0	4	0	1	0	0	1	5
% B/SB	0	0	0	0	0	0	0	0	0	0	0	0.4	0	0	0.4	0	0.1	0	0	0.1	0.2

Peak Hour Analysis From 03:15 PM to 06:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 04:45 PM

04:45 PM	19	3	0	3	25	13	5	13	0	31	0	435	30	7	472	21	272	14	0	307	835
05:00 PM	20	6	0	0	26	18	7	11	0	36	1	446	27	3	477	15	334	7	0	356	895
05:15 PM	14	3	0	1	18	13	7	10	3	33	3	451	26	3	483	12	265	11	1	289	823
05:30 PM	13	5	2	2	22	14	5	12	1	32	1	412	11	2	426	23	341	12	2	378	858
Total Volume	66	17	2	6	91	58	24	46	4	132	5	1744	94	15	1858	71	1212	44	3	1330	3411
% App. Total	72.5	18.7	2.2	6.6		43.9	18.2	34.8	3		0.3	93.9	5.1	0.8		5.3	91.1	3.3	0.2		
PHF	.825	.708	.250	.500	.875	.806	.857	.885	.333	.917	.417	.967	.783	.536	.962	.772	.889	.786	.375	.880	.953
Auto	55	15	1	6	77	56	24	46	4	130	3	1678	93	15	1789	68	1127	35	2	1232	3228
% Auto	83.3	88.2	50.0	100	84.6	96.6	100	100	100	98.5	60.0	96.2	98.9	100	96.3	95.8	93.0	79.5	66.7	92.6	94.6
HV	11	2	1	0	14	1	0	0	0	1	2	60	0	0	62	2	80	9	1	92	169
% HV	16.7	11.8	50.0	0	15.4	1.7	0	0	0	0.8	40.0	3.4	0	0	3.3	2.8	6.6	20.5	33.3	6.9	5.0
B/SB	0	0	0	0	0	1	0	0	0	1	0	6	1	0	7	1	5	0	0	6	14
% B/SB	0	0	0	0	0	1.7	0	0	0	0.8	0	0.3	1.1	0	0.4	1.4	0.4	0	0	0.5	0.4

**FIGURES**



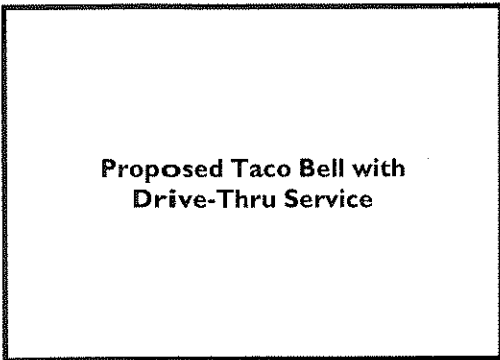
**STONEFIELD**

**Proposed Taco Bell with Drive-Thru Service**  
 2720 U.S. Route 130  
 North Brunswick, Middlesex County, New Jersey  
 Traffic Impact Study

**FIGURE I**  
 Site Location Map



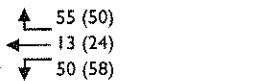
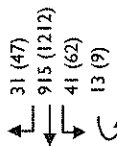
U.S. Route 130



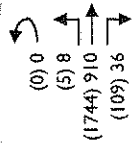
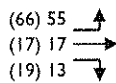
Proposed Taco Bell with Drive-Thru Service

(1869) 1033

Finnegans Lane



← 118 (132)



(188) 94 →

Davidson's Mill Road

**LEGEND**

- Existing Roadway
- - - Proposed Driveway
- ← MD (PM) Peak Hour Volumes
- Signalized Intersection

not to scale

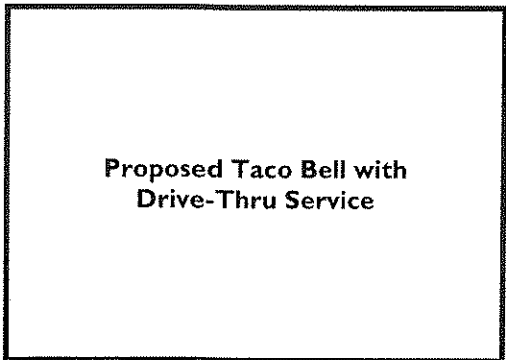
**STONEFIELD**

Proposed Taco Bell with Drive-Thru Service  
 2720 U.S. Route 130  
 North Brunswick, Middlesex County, New Jersey  
 Traffic Impact Study

**FIGURE 2**  
 2022 Existing Traffic  
 Volumes

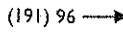
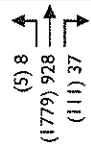
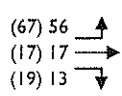
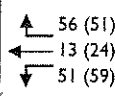
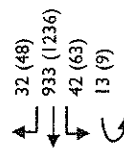


U.S. Route 130



Proposed Taco Bell with Drive-Thru Service

Finnegans Lane



Davidson's Mill Road

**LEGEND**

- Existing Roadway
- - - Proposed Driveway
- ← MD (PM) Peak Hour Volumes
- Signalized Intersection

not to scale

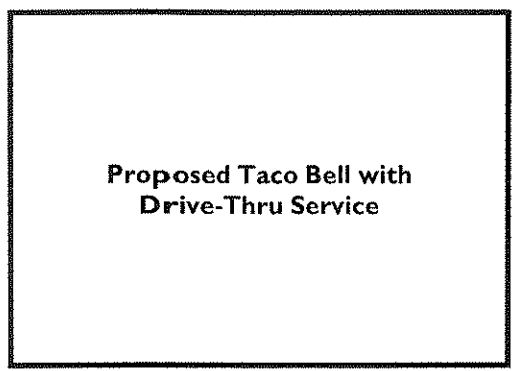
**STONEFIELD**

Proposed Taco Bell with Drive-Thru Service  
 2720 U.S. Route 130  
 North Brunswick, Middlesex County, New Jersey  
 Traffic Impact Study

**FIGURE 3**  
2024 Base Traffic Volumes

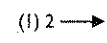
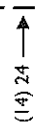
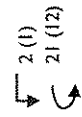


U.S. Route 130



Proposed Taco Bell with Drive-Thru Service

Finnegans Lane



Davidson's Mill Road

**LEGEND**

- Existing Roadway
- - - Proposed Driveway
- ← MD (PM) Peak Hour Volumes
- Signalized Intersection

not to scale

**STONEFIELD**

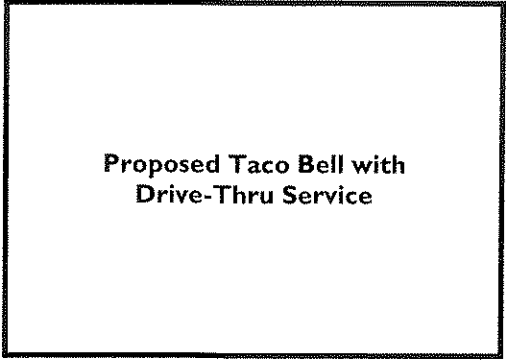
Proposed Taco Bell with Drive-Thru Service  
 2720 U.S. Route 130  
 North Brunswick, Middlesex County, New Jersey  
 Traffic Impact Study

**FIGURE 4**  
 Other Planned Projects  
 Future Traffic Volumes



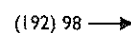
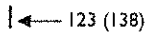
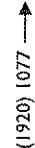
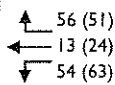
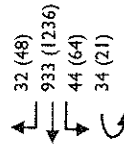


U.S. Route 130

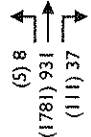
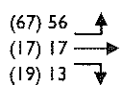


Proposed Taco Bell with Drive-Thru Service

Finnegans Lane



Davidson's Mill Road



**LEGEND**

- Existing Roadway
- - - Proposed Driveway
- ← MD (PM) Peak Hour Volumes
- Signalized Intersection

not to scale

**STONEFIELD**

**Proposed Taco Bell with Drive-Thru Service**  
 2720 U.S. Route 130  
 North Bruswick, Middlesex County, New Jersey  
 Traffic Impact Study

**FIGURE 5**  
2024 No-Build Traffic Volumes



U.S. Route 130

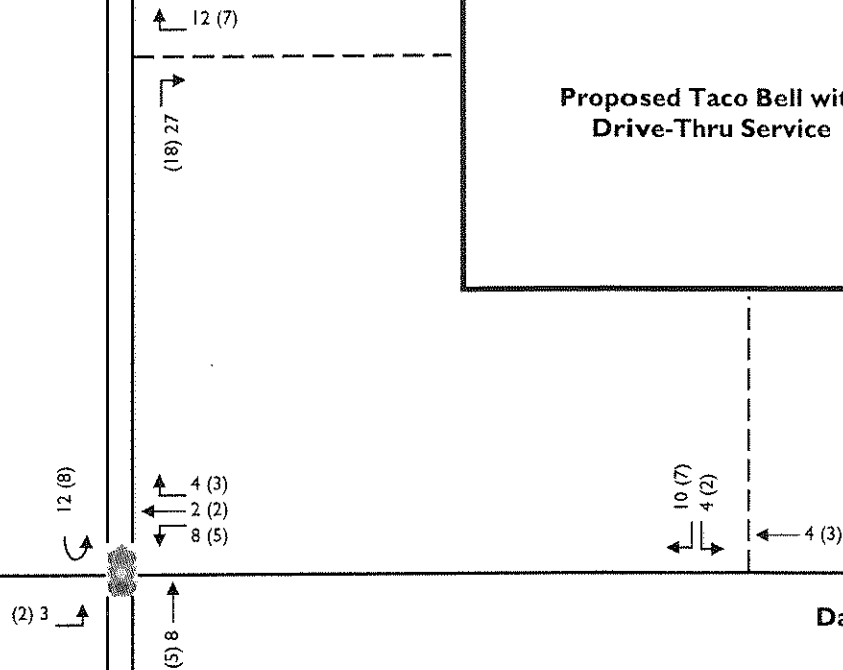
Proposed Taco Bell with Drive-Thru Service

Finnegans Lane

Davidson's Mill Road

**LEGEND**

- Existing Roadway
- - - Proposed Driveway
- ← MD (PM) Peak Hour Volumes
- ⊙ Signalized Intersection



not to scale

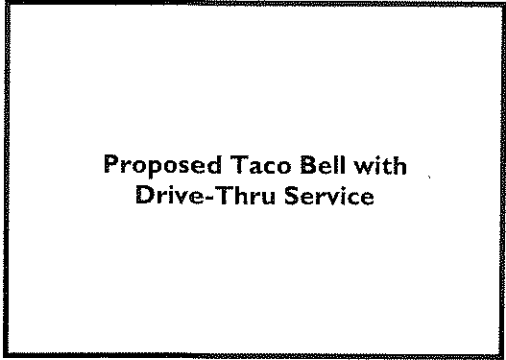
**STONEFIELD**

Proposed Taco Bell with Drive-Thru Service  
2720 U.S. Route 130  
North Brunswick, Middlesex County, New Jersey  
Traffic Impact Study

**FIGURE 6**  
"New" Site-Generated  
Traffic Volumes



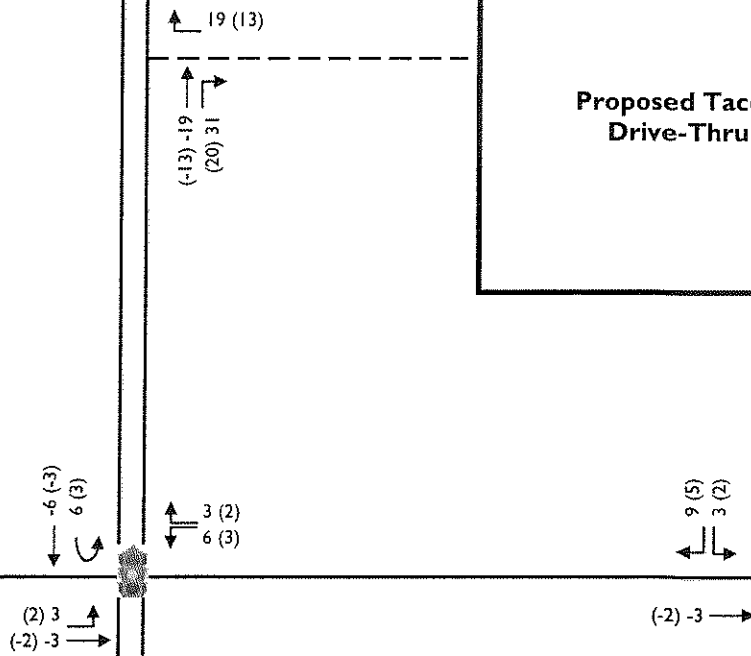
U.S. Route 130



Proposed Taco Bell with Drive-Thru Service

Finnegans Lane

Davidson's Mill Road



**LEGEND**

- Existing Roadway
- - - Proposed Driveway
- ← MD (PM) Peak Hour Volumes
- Signalized Intersection

not to scale

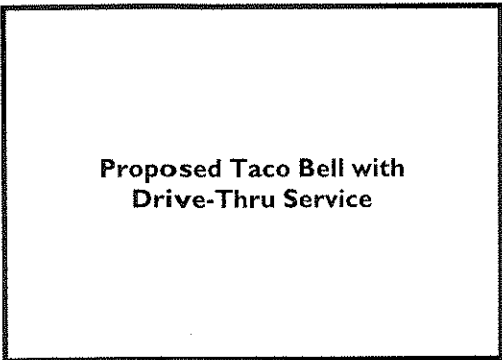
**STONEFIELD**

Proposed Taco Bell with Drive-Thru Service  
2720 U.S. Route 130  
North Brunswick, Middlesex County, New Jersey  
Traffic Impact Study

**FIGURE 7**  
"Pass-By" Site-Generated  
Traffic Volumes

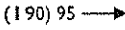
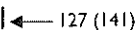
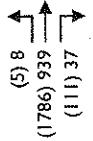
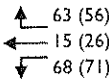
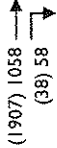
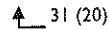
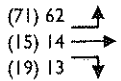
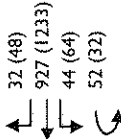


U.S. Route 130



Proposed Taco Bell with Drive-Thru Service

Finnegans Lane



Davidson's Mill Road

**LEGEND**

- Existing Roadway
- - - Proposed Driveway
- ← MD (PM) Peak Hour Volumes
- 🚦 Signalized Intersection

not to scale

**STONEFIELD**

**Proposed Taco Bell with Drive-Thru Service**  
 2720 U.S. Route 130  
 North Brunswick, Middlesex County, New Jersey  
 Traffic Impact Study

**FIGURE 8**  
 2024 Build Traffic Volumes

**HIGHWAY CAPACITY ANALYSIS DETAIL SHEETS**

HCM Signalized Intersection Capacity Analysis  
 1: U.S. Route 130 & Finnegan's Lane/Davidson's Mill Road

2022 Existing Condition  
 Weekday Midday Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations		↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	55	17	13	50	13	55	8	910	36	13	41	915	31
Future Volume (vph)	55	17	13	50	13	55	8	910	36	13	41	915	31
Ideal Flow (vphpl)	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950
Total Lost time (s)	7.0	7.0	7.0	7.0	7.0	7.0	5.0	7.0	7.0	5.0	5.0	7.0	7.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00	0.95	1.00
Frt	1.00	0.85	1.00	0.94	0.98	0.95	1.00	0.99	1.00	1.00	0.95	1.00	1.00
Fit Protected	0.96	1.00	1.00	0.98	0.98	0.95	1.00	1.00	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1687	1201	1201	1758	1758	985	3216	3216	3216	1771	3266	3266	3266
Fit Permitted	0.71	1.00	1.00	0.83	0.83	0.95	1.00	1.00	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1240	1201	1201	1482	1482	985	3216	3216	3216	1771	3266	3266	3266
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	60	19	14	55	14	60	9	1000	40	14	45	1005	34
RTOR Reduction (vph)	0	0	12	0	40	0	0	2	0	0	0	1	0
Lane Group Flow (vph)	0	79	2	0	89	0	9	1038	0	0	59	1038	0
Heavy Vehicles (%)	15%	0%	38%	2%	0%	2%	88%	15%	3%	0%	6%	13%	10%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA	Prot	Prot	Prot	NA	NA
Protected Phases	4	4	4	8	8	8	5	2	2	1	1	6	6
Permitted Phases	4	4	4	8	8	8	5	2	2	1	1	6	6
Actuated Green, G (s)	10.5	10.5	10.5	10.5	10.5	10.5	1.5	53.8	6.7	6.7	6.7	59.0	59.0
Effective Green, g (s)	10.5	10.5	10.5	10.5	10.5	10.5	1.5	53.8	6.7	6.7	6.7	59.0	59.0
Actuated g/C Ratio	0.12	0.12	0.12	0.12	0.12	0.12	0.02	0.60	0.07	0.07	0.07	0.66	0.66
Clearance Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	5.0	7.0	5.0	5.0	5.0	7.0	7.0
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	144	140	140	172	172	172	16	1922	131	131	131	2141	2141
v/s Ratio Prot	c0.06	0.00	0.00	0.06	0.06	0.06	0.01	c0.32	c0.03	c0.03	c0.03	c0.32	c0.32
v/s Ratio Perm	0.55	0.01	0.01	0.52	0.52	0.52	0.56	0.54	0.45	0.45	0.45	0.48	0.48
Uniform Delay, d1	37.5	35.2	35.2	37.4	37.4	37.4	43.9	10.8	39.9	39.9	39.9	7.8	7.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.3	0.0	0.0	1.1	1.1	1.1	24.2	1.1	0.9	0.9	0.9	0.8	0.8
Delay (s)	39.8	35.2	35.2	38.5	38.5	38.5	68.1	11.8	40.8	40.8	40.8	8.6	8.6
Level of Service	D	D	D	D	D	D	E	B	B	B	B	D	A

HCM Signalized Intersection Capacity Analysis

2022 Existing Condition

1: U.S. Route 130 & Finnegan's Lane/Davidson's Mill Road

Weekday Midday Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Approach Delay (s)	39.1			38.5			12.3					10.3	
Approach LOS	D			D			B					B	
<b>Intersection Summary</b>													
HCM 2000 Control Delay	13.9 HCM 2000 Level of Service B												
HCM 2000 Volume to Capacity ratio	0.53												
Actuated Cycle Length (s)	90.0												
Intersection Capacity Utilization	67.5% Sum of lost time (s) 19.0												
Analysis Period (min)	15 ICU Level of Service C												
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis  
 1: U.S. Route 130 & Finnegan's Lane/Davidson's Mill Road

2022 Existing Condition  
 Weekday Evening Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	66	17	19	58	24	50	5	1744	109	9	62	47
Future Volume (vph)	66	17	19	58	24	50	5	1744	109	9	62	47
Ideal Flow (vphpl)	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950
Total Lost time (s)	7.0	7.0	7.0	7.0	7.0	7.0	5.0	7.0	5.0	5.0	7.0	7.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Frt	1.00	0.85	1.00	0.95	0.95	1.00	1.00	0.99	1.00	1.00	0.99	0.99
Fit Protected	0.96	1.00	1.00	0.98	0.98	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1617	1467	1467	1779	1779	3537	1323	3537	1790	3426	1790	3426
Fit Permitted	0.68	1.00	1.00	0.82	0.82	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1148	1467	1467	1486	1486	3537	1323	3537	1790	3426	1790	3426
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	69	18	20	61	25	53	5	1836	115	9	65	49
RTOR Reduction (vph)	0	0	17	0	28	0	0	3	0	0	0	0
Lane Group Flow (vph)	0	87	3	0	111	0	5	1948	0	0	74	1323
Heavy Vehicles (%)	17%	12%	13%	4%	0%	0%	40%	4%	1%	0%	4%	22%
Turn Type	Perm	NA	Perm	Perm	NA	NA	Prot	NA	Prot	Prot	Prot	NA
Protected Phases	4	4	4	8	8	8	5	2	1	1	1	6
Permitted Phases	4	4	4	8	8	8	5	2	1	1	1	6
Actuated Green, G (s)	11.4	11.4	11.4	11.4	11.4	11.4	1.4	52.4	7.2	7.2	58.2	58.2
Effective Green, g (s)	11.4	11.4	11.4	11.4	11.4	11.4	1.4	52.4	7.2	7.2	58.2	58.2
Actuated g/C Ratio	0.13	0.13	0.13	0.13	0.13	0.13	0.02	0.58	0.08	0.08	0.65	0.65
Clearance Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	5.0	7.0	5.0	5.0	7.0	7.0
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	145	185	185	188	188	2059	20	2059	143	143	2215	2215
v/s Ratio Prot	c0.08	0.00	0.00	0.07	0.07	0.07	0.00	c0.55	c0.04	c0.04	c0.39	c0.39
v/s Ratio Perm	0.60	0.01	0.01	0.59	0.59	0.59	0.25	0.95	0.52	0.52	0.60	0.60
Uniform Delay, d1	37.1	34.4	34.4	37.1	37.1	37.1	43.8	17.5	39.7	39.7	9.2	9.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.4	0.0	0.0	3.3	3.3	3.3	2.4	10.6	1.3	1.3	1.2	1.2
Delay (s)	41.5	34.4	34.4	40.4	40.4	40.4	46.2	28.1	41.0	41.0	10.4	10.4
Level of Service	D	C	C	D	D	D	D	C	D	D	B	B



# HCM Signalized Intersection Capacity Analysis

2022 Existing Condition  
Weekday Evening Peak Hour

## 1: U.S. Route 130 & Finnegan's Lane/Davidson's Mill Road

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT	SBR	
Approach Delay (s)	40.2			40.4				28.2				12.0		
Approach LOS	D			D			C					B		
<b>Intersection Summary</b>														
HCM 2000 Control Delay	22.7						HCM 2000 Level of Service						C	
HCM 2000 Volume to Capacity ratio	0.85													
Actuated Cycle Length (s)	90.0						Sum of lost time (s)						19.0	
Intersection Capacity Utilization	83.2%						ICU Level of Service						E	
Analysis Period (min)	15													
c Critical Lane Group														

HCM Signalized Intersection Capacity Analysis  
 1: U.S. Route 130 & Finnegan's Lane/Davidson's Mill Road

2024 No-Build Condition  
 Weekday Midday Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	17	13	54	13	56	8	931	37	34	44	933
Future Volume (vph)	56	17	13	54	13	56	8	931	37	34	44	933
Ideal Flow (vphpl)	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950
Total Lost time (s)	7.0	7.0	7.0	7.0	7.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.85	0.94	0.98	0.98	0.98	1.00	0.99	1.00	1.00	1.00	1.00
Fit Protected	0.96	1.00	0.98	1.00	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1685	1201	1758	1758	1758	1758	985	3216	1792	3265	1792	3265
Fit Permitted	0.70	1.00	0.82	0.82	0.82	0.82	0.95	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1217	1201	1475	1475	1475	1475	985	3216	1792	3265	1792	3265
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	62	19	14	59	14	62	9	1023	41	37	48	1025
RTOR Reduction (vph)	0	0	12	0	39	0	0	2	0	0	0	1
Lane Group Flow (vph)	0	81	2	0	96	0	9	1062	0	0	85	1059
Heavy Vehicles (%)	15%	0%	38%	2%	0%	2%	88%	15%	3%	0%	6%	13%
Turn Type	Perm	NA	Perm	Perm	NA	NA	Prot	NA	Prot	Prot	NA	NA
Protected Phases	4	4	4	8	8	8	5	2	1	1	6	6
Permitted Phases	4	4	4	8	8	8	5	2	1	1	6	6
Actuated Green, G (s)	10.7	10.7	10.7	10.7	10.7	10.7	1.5	52.6	7.7	7.7	58.8	58.8
Effective Green, g (s)	10.7	10.7	10.7	10.7	10.7	10.7	1.5	52.6	7.7	7.7	58.8	58.8
Actuated g/C Ratio	0.12	0.12	0.12	0.12	0.12	0.12	0.02	0.38	0.09	0.09	0.65	0.65
Clearance Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	5.0	7.0	5.0	5.0	7.0	7.0
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	144	142	175	175	175	175	16	1879	153	2133	153	2133
v/s Ratio Prot	c0.07	0.00	0.07	0.07	0.07	0.07	0.01	c0.33	c0.05	c0.05	0.32	0.32
v/s Ratio Perm	0.56	0.01	0.55	0.55	0.55	0.55	0.56	0.57	0.56	0.56	0.50	0.50
Uniform Delay, d1	37.4	35.0	37.4	37.4	37.4	37.4	43.9	11.6	39.5	39.5	8.0	8.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.0	0.0	1.9	1.9	1.9	1.9	24.2	1.2	2.5	2.5	0.8	0.8
Delay (s)	40.4	35.0	39.3	39.3	39.3	39.3	68.1	12.8	42.0	42.0	8.8	8.8
Level of Service	D	C	C	D	D	D	E	B	B	D	A	A

# HCM Signalized Intersection Capacity Analysis

2024 No-Build Condition  
Weekday Midday Peak Hour

## 1: U.S. Route 130 & Finnegan's Lane/Davidson's Mill Road

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT	SBR	
Approach Delay (s)	39.6			39.3			13.3					11.3		
Approach LOS	D			D			B					B		
<b>Intersection Summary</b>														
HCM 2000 Control Delay	14.8						HCM 2000 Level of Service						B	
HCM 2000 Volume to Capacity ratio	0.56													
Actuated Cycle Length (s)	90.0						Sum of lost time (s)						19.0	
Intersection Capacity Utilization	67.8%						ICU Level of Service						C	
Analysis Period (min)	15													
c Critical Lane Group														

HCM Signalized Intersection Capacity Analysis  
 1: U.S. Route 130 & Finnegan's Lane/Davidson's Mill Road

2024 No-Build Condition  
 Weekday Evening Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations													
Traffic Volume (vph)	67	17	19	63	24	51	5	1781	111	21	64	1236	48
Future Volume (vph)	67	17	19	63	24	51	5	1781	111	21	64	1236	48
Ideal Flow (vphpl)	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950
Total Lost time (s)	7.0	7.0	7.0	7.0	7.0	7.0	5.0	7.0	7.0	5.0	5.0	7.0	7.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	0.95
Frt	1.00	0.85	0.95	0.95	0.95	0.95	1.00	0.99	1.00	1.00	0.99	1.00	0.99
Flt Protected	0.96	1.00	0.98	0.98	0.98	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95
Satd. Flow (prot)	1617	1467	1778	1778	1778	1323	3537	3537	1798	3425	1798	3425	1798
Flt Permitted	0.67	1.00	0.81	0.81	0.81	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95
Satd. Flow (perm)	1133	1467	1475	1475	1475	1323	3537	3537	1798	3425	1798	3425	1798
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	71	18	20	66	25	54	5	1875	117	22	67	1301	51
RTOR Reduction (vph)	0	0	17	0	27	0	0	3	0	0	0	2	0
Lane Group Flow (vph)	0	89	3	0	118	0	5	1989	0	0	89	1350	0
Heavy Vehicles (%)	17%	12%	13%	4%	0%	0%	40%	4%	1%	0%	4%	7%	22%
Turn Type	Perm	NA	Perm	Perm	NA	NA	Prot	NA	NA	Prot	Prot	NA	NA
Protected Phases	4	4	4	8	8	8	5	2	2	1	1	6	6
Permitted Phases	4	4	4	8	8	8	5	2	2	1	1	6	6
Actuated Green, G (s)	11.8	11.8	11.8	11.8	11.8	11.8	1.4	51.4	51.4	7.8	7.8	57.8	57.8
Effective Green, g (s)	11.8	11.8	11.8	11.8	11.8	11.8	1.4	51.4	51.4	7.8	7.8	57.8	57.8
Actuated g/C Ratio	0.13	0.13	0.13	0.13	0.13	0.13	0.02	0.57	0.57	0.09	0.09	0.64	0.64
Clearance Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	5.0	7.0	7.0	5.0	5.0	7.0	7.0
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	148	192	192	193	193	193	20	2020	20	155	2199	2199	2199
v/s Ratio Prot	0.08	0.00	0.00	c0.08	c0.08	c0.08	0.00	c0.56	c0.56	c0.05	c0.05	c0.39	c0.39
v/s Ratio Perm	0.60	0.01	0.01	0.61	0.61	0.61	0.25	0.98	0.98	0.57	0.57	0.61	0.61
Uniform Delay, d1	36.9	34.0	34.0	36.9	36.9	36.9	43.8	18.9	18.9	39.5	39.5	9.5	9.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.6	0.0	0.0	4.0	4.0	4.0	2.4	16.7	16.7	3.2	3.2	1.3	1.3
Delay (s)	41.5	34.0	34.0	40.9	40.9	40.9	46.2	35.6	35.6	42.7	42.7	10.8	10.8
Level of Service	D	C	C	D	D	D	D	D	D	D	D	B	B

# HCM Signalized Intersection Capacity Analysis

2024 No-Build Condition  
Weekday Evening Peak Hour

## 1: U.S. Route 130 & Finnegan's Lane/Davidson's Mill Road

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT	SBR	
Approach Delay (s)	40.2			40.9			35.6				12.8			
Approach LOS	D			D			D				B			
<b>Intersection Summary</b>														
HCM 2000 Control Delay	27.0												HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.88													
Actuated Cycle Length (s)	90.0												Sum of lost time (s)	19.0
Intersection Capacity Utilization	87.4%												ICU Level of Service	E
Analysis Period (min)	15													
c Critical Lane Group														

2024 Build Condition  
Weekday Midday Peak Hour

HCM Signalized Intersection Capacity Analysis  
1: U.S. Route 130 & Finnegan's Lane/Davidson's Mill Road

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations													
Traffic Volume (vph)	62	14	13	68	15	63	8	939	37	52	44	927	32
Future Volume (vph)	62	14	13	68	15	63	8	939	37	52	44	927	32
Ideal Flow (vphpl)	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950
Total Lost time (s)	7.0	7.0	7.0	7.0	7.0	7.0	5.0	7.0	7.0	5.0	7.0	7.0	7.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95
Frt	1.00	0.85	1.00	0.94	1.00	0.99	1.00	0.99	1.00	1.00	1.00	1.00	1.00
Flt Protected	0.96	1.00	1.00	0.98	1.00	0.98	0.95	1.00	0.95	1.00	0.95	1.00	0.95
Satd. Flow (prot)	1668	1201	1201	1763	1763	1763	985	3216	1803	3265	1803	3265	1803
Flt Permitted	0.65	1.00	1.00	0.81	1.00	0.81	0.95	1.00	0.95	1.00	0.95	1.00	0.95
Satd. Flow (perm)	1124	1201	1201	1460	1460	1460	985	3216	1803	3265	1803	3265	1803
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	68	15	14	75	16	69	9	1032	41	57	48	1019	35
RTOR Reduction (vph)	0	0	12	0	34	0	0	2	0	0	0	1	0
Lane Group Flow (vph)	0	83	2	0	126	0	9	1071	0	0	105	1053	0
Heavy Vehicles (%)	15%	0%	38%	2%	0%	2%	88%	15%	3%	0%	6%	13%	10%
Turn Type	Perm	NA	Perm	Perm	NA	NA	Prot	NA	NA	Prot	Prot	NA	NA
Protected Phases	4	4	4	8	8	8	5	2	2	1	1	6	6
Permitted Phases	4	4	4	8	8	8	5	2	2	1	1	6	6
Actuated Green, G (s)	12.3	12.3	12.3	12.3	12.3	12.3	1.5	50.2	8.5	8.5	57.2	57.2	57.2
Effective Green, g (s)	12.3	12.3	12.3	12.3	12.3	12.3	1.5	50.2	8.5	8.5	57.2	57.2	57.2
Actuated g/C Ratio	0.14	0.14	0.14	0.14	0.14	0.14	0.02	0.56	0.09	0.09	0.64	0.64	0.64
Clearance Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	5.0	7.0	5.0	5.0	7.0	7.0	7.0
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	153	164	164	199	199	199	16	1793	170	170	2075	2075	2075
v/s Ratio Prot							0.01	c0.33			c0.06	0.32	0.32
v/s Ratio Perm	0.07	0.00	0.00	c0.09	c0.09	c0.09							
v/c Ratio	0.54	0.01	0.01	0.63	0.63	0.63	0.56	0.60	0.62	0.62	0.51	0.51	0.51
Uniform Delay, d1	36.2	33.6	33.6	36.7	36.7	36.7	43.9	13.2	39.2	39.2	8.8	8.8	8.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.1	0.0	0.0	4.8	4.8	4.8	24.2	1.5	4.6	4.6	0.9	0.9	0.9
Delay (s)	38.3	33.6	33.6	41.5	41.5	41.5	68.1	14.7	43.8	43.8	9.7	9.7	9.7
Level of Service	D	C	C	D	D	D	E	B	D	D	A	A	A



HCM Signalized Intersection Capacity Analysis  
 1: U.S. Route 130 & Finnegan's Lane/Davidson's Mill Road

2024 Build Condition  
 Weekday Midday Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT	SBR	
Approach Delay (s)	37.6			41.5			15.1					12.8		
Approach LOS	D			D			B					B		
<b>Intersection Summary</b>														
HCM 2000 Control Delay	16.6			HCM 2000 Level of Service			B							
HCM 2000 Volume to Capacity ratio	0.61													
Actuated Cycle Length (s)	90.0			Sum of lost time (s)			19.0							
Intersection Capacity Utilization	69.0%			ICU Level of Service			C							
Analysis Period (min)	15													
Critical Lane Group														

**Intersection**

Int Delay, s/veh 0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↑	↑↑			↑↑
Traffic Vol, veh/h	0	31	1058	58	0	1055
Future Vol, veh/h	0	31	1058	58	0	1055
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	0	0	15	0	0	12
Mvmt Flow	0	32	1091	60	0	1088

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	-	576	0	0	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-
Critical Hdwy	-	6.9	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-
Pot Cap-1 Maneuver	0	466	-	-	0
Stage 1	0	-	-	-	0
Stage 2	0	-	-	-	0
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	466	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.3	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBT
Capacity (veh/h)	-	-	466
HCM Lane V/C Ratio	-	-	0.069
HCM Control Delay (s)	-	-	13.3
HCM Lane LOS	-	-	B
HCM 95th %tile Q(veh)	-	-	0.2



HCM 6th TWSC  
3: Davidson's Mill Road & Driveway

2024 Build Condition  
Weekday Midday Peak Hour

Intersection						
Int Delay, s/veh	1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↓	↓
Traffic Vol, veh/h	0	95	127	0	7	19
Future Vol, veh/h	0	95	127	0	7	19
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	74	74	74	74	74	74
Heavy Vehicles, %	0	4	2	0	0	0
Mvmt Flow	0	128	172	0	9	26

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	-	0	-	0	300 172
Stage 1	-	-	-	-	172 -
Stage 2	-	-	-	-	128 -
Critical Hdwy	-	-	-	-	6.4 6.2
Critical Hdwy Stg 1	-	-	-	-	5.4 -
Critical Hdwy Stg 2	-	-	-	-	5.4 -
Follow-up Hdwy	-	-	-	-	3.5 3.3
Pot Cap-1 Maneuver	0	-	-	0	696 877
Stage 1	0	-	-	0	863 -
Stage 2	0	-	-	0	903 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	696 877
Mov Cap-2 Maneuver	-	-	-	-	696 -
Stage 1	-	-	-	-	863 -
Stage 2	-	-	-	-	903 -

Approach	EB	WB	SB
HCM Control Delay, s	0	0	9.6
HCM LOS			A

Minor Lane/Major Mvmt	EBT	WBT	SBLn1
Capacity (veh/h)	-	-	820
HCM Lane V/C Ratio	-	-	0.043
HCM Control Delay (s)	-	-	9.6
HCM Lane LOS	-	-	A
HCM 95th %tile Q(veh)	-	-	0.1

# HCM Signalized Intersection Capacity Analysis

2024 Build Condition

## 1: U.S. Route 130 & Finnegan's Lane/Davidson's Mill Road

Weekday Evening Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations													
Traffic Volume (vph)	71	15	19	71	26	56	5	1786	111	32	64	1233	48
Future Volume (vph)	71	15	19	71	26	56	5	1786	111	32	64	1233	48
Ideal Flow (vphpl)	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950
Total Lost time (s)	7.0	7.0	7.0	7.0	7.0	7.0	5.0	7.0	7.0	5.0	5.0	7.0	7.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	0.95
Frt	1.00	0.85	0.95	0.95	0.95	0.95	1.00	0.99	0.99	1.00	1.00	0.99	0.99
Flt Protected	0.96	1.00	1.00	0.98	0.98	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1613	1467	1467	1778	1778	1778	1323	3537	1805	3425	1805	3425	3425
Flt Permitted	0.65	1.00	1.00	0.81	0.81	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1084	1467	1467	1467	1467	1467	1323	3537	1805	3425	1805	3425	3425
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	75	16	20	75	27	59	5	1880	117	34	67	1298	51
RTOR Reduction (vph)	0	0	17	0	26	0	0	4	0	0	0	2	0
Lane Group Flow (vph)	0	91	3	0	135	0	5	1993	0	0	101	1347	0
Heavy Vehicles (%)	17%	12%	13%	4%	0%	0%	40%	4%	1%	0%	4%	7%	22%
Turn Type	Perm	NA	Perm	Perm	NA	NA	Prot	NA	Prot	Prot	Prot	NA	NA
Protected Phases	4	4	4	8	8	8	5	2	1	1	1	6	6
Permitted Phases	4	4	4	8	8	8	5	2	1	1	1	6	6
Actuated Green, G (s)	12.7	12.7	12.7	12.7	12.7	12.7	1.4	50.0	8.3	8.3	8.3	56.9	56.9
Effective Green, g (s)	12.7	12.7	12.7	12.7	12.7	12.7	1.4	50.0	8.3	8.3	8.3	56.9	56.9
Actuated g/C Ratio	0.14	0.14	0.14	0.14	0.14	0.14	0.02	0.56	0.09	0.09	0.09	0.63	0.63
Clearance Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	5.0	7.0	5.0	5.0	5.0	7.0	7.0
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	152	207	207	207	207	207	20	1965	166	166	166	2165	2165
v/s Ratio Prot							0.00	c0.56	c0.06	c0.06	c0.06	c0.39	c0.39
v/s Ratio Perm	0.08	0.00	0.00	c0.09	c0.09	c0.09	0.25	1.01	0.61	0.61	0.61	0.62	0.62
v/c Ratio	0.60	0.01	0.01	0.65	0.65	0.65	43.8	20.0	39.3	39.3	39.3	10.0	10.0
Uniform Delay, d1	36.3	33.3	33.3	36.6	36.6	36.6	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	2.4	24.0	4.3	4.3	4.3	1.4	1.4
Incremental Delay, d2	4.2	0.0	0.0	5.5	5.5	5.5	46.2	44.0	11.4	11.4	11.4	11.4	11.4
Delay (s)	40.4	33.3	33.3	42.1	42.1	42.1	46.2	44.0	43.6	43.6	43.6	11.4	11.4
Level of Service	D	D	C	D	D	D	D	D	D	D	D	B	B

Stonefield Engineering & Design  
BPM

Synchro 11 Report  
03/29/2022

# HCM Signalized Intersection Capacity Analysis

2024 Build Condition  
Weekday Evening Peak Hour

## 1: U.S. Route 130 & Finnegan's Lane/Davidson's Mill Road

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Approach Delay (s)	39.1			42.1			44.0					13.6	
Approach LOS	D			D			D					B	
<b>Intersection Summary</b>													
HCM 2000 Control Delay	31.9			HCM 2000 Level of Service			C						
HCM 2000 Volume to Capacity ratio	0.90												
Actuated Cycle Length (s)	90.0			Sum of lost time (s)			19.0						
Intersection Capacity Utilization	88.4%			ICU Level of Service			E						
Analysis Period (min)	15												
c Critical Lane Group													

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↑	↑↑			↑↑
Traffic Vol, veh/h	0	21	1907	38	0	1377
Future Vol, veh/h	0	21	1907	38	0	1377
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	0	0	4	0	0	7
Mvmt Flow	0	22	1966	39	0	1420

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	-	1003	0	0	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-
Critical Hdwy	-	6.9	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-
Pot Cap-1 Maneuver	0	244	-	0	-
Stage 1	0	-	-	0	-
Stage 2	0	-	-	0	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	244	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	21.2	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBT
Capacity (veh/h)	-	244	-
HCM Lane V/C Ratio	-	0.089	-
HCM Control Delay (s)	-	21.2	-
HCM Lane LOS	-	C	-
HCM 95th %tile Q(veh)	-	0.3	-

HCM 6th TWSC  
3: Davidson's Mill Road & Driveway

2024 Build Condition  
Weekday Evening Peak Hour

**Intersection**

Int Delay, s/veh 0.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↑	↑
Traffic Vol, veh/h	0	190	141	0	4	12
Future Vol, veh/h	0	190	141	0	4	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	5	1	0	0	0
Mvmt Flow	0	207	153	0	4	13

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	-	0	-	0	360 153
Stage 1	-	-	-	-	153 -
Stage 2	-	-	-	-	207 -
Critical Hdwy	-	-	-	-	6.4 6.2
Critical Hdwy Stg 1	-	-	-	-	5.4 -
Critical Hdwy Stg 2	-	-	-	-	5.4 -
Follow-up Hdwy	-	-	-	-	3.5 3.3
Pot Cap-1 Maneuver	0	-	-	0	643 898
Stage 1	0	-	-	0	880 -
Stage 2	0	-	-	0	832 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	643 898
Mov Cap-2 Maneuver	-	-	-	-	643 -
Stage 1	-	-	-	-	880 -
Stage 2	-	-	-	-	832 -

Approach	EB	WB	SB
HCM Control Delay, s	0	0	9.5
HCM LOS			A

Minor Lane/Major Mvmt	EBT	WBT	SBLn1
Capacity (veh/h)	-	-	817
HCM Lane V/C Ratio	-	-	0.021
HCM Control Delay (s)	-	-	9.5
HCM Lane LOS	-	-	A
HCM 95th %tile Q(veh)	-	-	0.1

**EXISTING TRAFFIC SIGNAL TIMING DIRECTIVE**



90 SECOND BACKGROUND CYCLE

PHASE	SIGNAL INDICATIONS NORMAL OPERATION							TIME (SECS.)
	<u>1,2</u>	<u>4,5</u>	<u>8,9,11,12</u>	<u>14,15</u>	<u>16,17</u>	<u>18-25</u>	<u>26-31</u>	
A. Route US 130	G	G	R	<R-	<R-	DW	W	36-12
Pedestrian Clearance	G	G	R	<R-	<R-	DW	FDW	21
Change	Y	Y	R	<R-	<R-	DW	DW	5*
Clearance	R	R	R	<R-	<R-	DW	DW	2
B. Finnegans Lrv/Davidson Mill Rd ROW	R	R	G	<R-	<R-	DW	DW	7-20
Change	R	R	Y	<R-	<R-	DW	DW	4
Clearance	R	R	R	<R-	<R-	DW	DW	3
C. Route US 130 Lead Left	R	R	R	<G-	<G-	DW	DW	7-18
Change	R	R	R	<Y-	<Y-	DW	DW	3
Clearance	R	R	R	<R-	<R-	DW	DW	2
EMERGENCY FLASH	Y	Y	R	<R-	<R-	DARK	DARK	-

PHASE	SIGNAL INDICATIONS WITH PEDESTRIAN ACTUATION							TIME (SECS.)
	<u>1,2</u>	<u>4,5</u>	<u>8,9,11,12</u>	<u>14,15</u>	<u>16,17</u>	<u>18-25</u>	<u>26-31</u>	
	A. Route US 130	G	G	R	<R-	<R-	DW	
Pedestrian Clearance	G	G	R	<R-	<R-	DW	FDW	21
Change	Y	Y	R	<R-	<R-	DW	DW	5*
Clearance	R	R	R	<R-	<R-	DW	DW	2
B. Finnegans Ln/Davidson Mill Rd:ROW	R	R	G	<R-	<R-	W	DW	7
Pedestrian Clearance	R	R	G	<R-	<R-	FDW	DW	33
Change	R	R	Y	<R-	<R-	DW	DW	4
Clearance	R	R	R	<R-	<R-	DW	DW	3
C. Route US 130 Lead Left	R	R	R	<G-	<G-	DW	DW	7-18
Change	R	R	R	<Y-	<Y-	DW	DW	3
Clearance	R	R	R	<R-	<R-	DW	DW	2
EMERGENCY FLASH	Y	Y	R	<R-	<R-	DARK	DARK	-

**NOTES:**

1. SIGNAL HEADS NO. 3, 6, 7, 10 AND 13 ARE NOT IN USE.
2. \*AN OFFSET OF 0 SECONDS IS TO BE MEASURED FROM THE BEGINNING OF YELLOW TO ROUTE 130 TRAFFIC AT THIS INTERSECTION.
3. THE ROUTE US 130 LEFT-TURN SLOTS ARE TO OCCUR SIMULTANEOUSLY AND INDEPENDENTLY. UPON TERMINATION OF A LEFT-TURN PHASE DUE TO NO VEHICLE DEMAND, THE NON-CONFLICTING THROUGH MOVEMENT IS TO OCCUR AFTER THE NECESSARY CLEARANCES HAVE BEEN SATISFIED.
4. THE VEHICLE EXTENSION IS TO BE SET AT 2 SECONDS.
5. THE MEMORY CIRCUIT AND THE MANUAL CONTROL ARE TO BE DISCONNECTED.
6. THE PHASE B MAXIMUM GREEN TIME AND CYCLE LENGTH WILL BE EXCEEDED DURING PEDESTRIAN ACTUATION USING THE PEDESTRIAN OVERRIDE FEATURE.