TRAFFIC IMPACT STUDY

For

DUNKIN'

Triple J. Family. Inc. D/B/A Dunkin' Baskin Robbins
Proposed Dunkin' Drive-Thru

Property Located at:

275 South Washington Avenue (CR 39)
Block 253 – Lot 17
Borough of Bergenfield, Bergen County, NJ

Prepared by:

DYNAMIC TRAFFIC

1904 Main Street | 245 Main Street, Suite #110
Lake Como, NJ 07719 | Chester, NJ 07930
(732) 681-0760

Joseph J. Staigar, PE, PP
NJ PE License #30024

Connor G. Hughes, PE
NJ PE License #57245

December 10, 2021

4098-99-001TE

MJB

INTRODUCTION

It is proposed to construct a Dunkin' drive-thru lane on a parcel of land currently developed with a Dunkin' coffee shop, located at 275 South Washington Avenue (CR 39) in the Borough of Bergenfield, Bergen County, New Jersey (see Figure 1 in Appendix A). The site is designated as Block 253 – Lot 17 on the Borough of Bergenfield Tax Maps. The existing use consists of a 2,517 SF Dunkin' coffee shop. It is proposed to maintain the existing Dunkin' building and construct a drive-thru lane ("The Project"). The site is located within the B2 – Business and Professional District. Access to the site is currently provided via one (1) full movement driveway along South Washington Avenue and one (1) egress only driveway along Magnolia Street. It is proposed to re-construct the existing access points as well as construct one (1) ingress only driveway along South Washington Avenue which will serve the drive-thru lane. Parking will be provided via sixteen (16) on-site parking spaces.

Dynamic Traffic, LLC has been retained to prepare this study to assess the traffic impact associated with the construction of The Project on the adjacent roadway network. This study documents the methodology, analyses, findings and conclusions of our study and includes:

- A detailed field inspection was conducted to obtain an inventory of existing roadway geometry, traffic control, and location and geometry of existing driveways and intersections.
- Existing traffic data was collected via manual turning movement (MTM) counts during the weekday AM peak period at the intersections of South Washington Avenue with Magnolia Street and South Washington Avenue with the site driveway.
- Projections of traffic to be generated by the proposed development were prepared utilizing trip generation data as published by the Institute of Transportation Engineers. Site traffic was then assigned to the adjacent street system based upon the anticipated directional distribution.
- Capacity analyses were conducted for the Existing, No Build, and Build conditions for the study intersections.
- The proposed points of ingress and egress were inspected for adequacy of geometric design, spacing and/or alignment to streets and driveways on the opposite side of the street, relationship to other driveways adjacent to the development, and conformance with accepted design standards.
- The site plan as designed was reviewed for sufficiency in accommodating large wheel base vehicles such as delivery trucks, refuse trucks, and emergency vehicles.
- The parking layout and supply was assessed based on accepted design standards, local requirements, and demand experienced at similar developments.

EXISTING CONDITIONS

A review of the existing roadway conditions near the proposed site was conducted to provide the basis for assessing the traffic impact of the development. This included field investigations of the surrounding roadways and intersections, collection of traffic volume data, and extensive analyses.

Existing Roadway Conditions

The following are descriptions of the roadways in the study area:

South Washington Avenue (CR 39) is an Urban Principal Arterial roadway under Bergen County jurisdiction with a general north/south orientation. In the vicinity of the site the posted speed limit is 30 MPH and the roadway provides one travel lane in each direction. Curb and sidewalk are provided along both sides of the roadway. South Washington Avenue provides straight horizontal alignment and a relatively flat vertical alignment. The land uses along South Washington Avenue in the vicinity of The Project are mixed residential and commercial.

Magnolia Street is a local roadway under the jurisdiction of the Borough of Bergenfield with a general east/west orientation. In the vicinity of the site the speed limit is unposted and the roadway provides one travel lane in each direction. Curb and sidewalk are provided along both sides of the roadway. Magnolia Street provides a straight horizontal alignment along the site frontage and a relatively flat vertical alignment. The land uses along Magnolia Street in the vicinity of The Project are primarily residential.

Existing Traffic Volumes

Manual turning movement (MTM) counts were conducted on Tuesday, November 30, 2021 from 7:00 – 9:00 AM at the intersections of South Washington Avenue with Magnolia Street and South Washington Avenue with the site driveway. Review of the collected traffic data reveals that the weekday morning peak street hour (PSH) occurs between 7:30 – 8:30 AM. Figure 2, located in Appendix A, shows the existing peak hour traffic volumes at the study intersections. All traffic counts are contained in Appendix B.

Existing Capacity Analysis

The methodology utilized in the capacity analyses is described in the *Highway Capacity Manual*, published by the Transportation Research Board. In general, the term Level of Service (LOS) is used to provide a "qualitative" evaluation of capacity based upon certain "quantitative" calculations related to empirical values, such as traffic volume and intersection control.

An unsignalized (STOP sign controlled) driveway or side street along a through route is seldom critical from an overall capacity standpoint, however, it may be of great significance to the capacity of the minor cross-route, and it may influence the quality of traffic flow on both. When analyzing an unsignalized intersection, it is assumed that both the major street through and right turn movements are unimpeded and have the right-of-way over all side street traffic and left turns from the major street. All other turning movements in the intersection cross, merge with, or are otherwise impeded by major street movements. Traffic delays at unsignalized intersections are determined by sequentially processing these impeded movements. Table I describes the Level of Service ranges for unsignalized (stop controlled) intersections.

Table I
Level of Service Criteria
for Unsignalized Intersections

Level of Service	Average Control Delay (seconds per vehicle)
A	0.0 to 10.0
B	10.1 to 15.0
C	15.1 to 25.0
D	25.1 to 35.0
E	35.1 to 50.0
F	greater than 50.0

It should be noted that the analyses within the *Highway Capacity Manual* assume a random arrival for all the movements, which may not be the case if an adjacent traffic signal is present that platoons vehicles.

All capacity analyses were performed utilizing Synchro 11 software. It should be noted that the existing percentage of trucks and peak hour factors were used in the existing analysis. Table II summarizes the existing Levels of Service (LOS) and delays. All capacity analysis calculation worksheets are contained in Appendix C.

Table II
Existing Levels of Service

Intersection	Direction/ Movement		AM PSH
South Washington Avenue & Magnolia Street	WB	LR	C (20)
	SB	LT	A (9)
South Washington Avenue & Site Driveway	WB	LR	C (22)
	SB	LT	A (9)
Magnolia Street & Site Driveway	WB	LR	A (9)

A (#) - Unsignalized Intersection Level of Service (seconds of delay per vehicle)

The following are discussions pertaining to each of the existing intersections analyzed.

South Washington Avenue and Magnolia Street

Magnolia Street intersects South Washington Avenue to form an unsignalized T-intersection with the Magnolia Street operating under stop control. The northbound approach of South Washington Avenue provides a shared through/right turn lane, while the southbound approach provides a shared left turn/through lane. The westbound approach of Magnolia Street provides a shared left turn/right turn lane.

A review of the existing analysis reveals that the individual intersection movements operate at Level of Service "C" or better during the analyzed peak period. See Table II for the individual movement Levels of Service and delays.

South Washington Avenue and Site Driveway

The site driveway intersects South Washington Avenue to form an unsignalized T-intersection with the site driveway operating under stop control. The northbound approach of South Washington Avenue provides a shared through/right turn lane, while the southbound approach provides a shared left turn/through lane. The westbound approach of the site driveway provides a shared left turn/right turn lane.

A review of the existing analysis reveals that the individual intersection movements operate at Level of Service "C" or better during the analyzed peak period. See Table II for the individual movement Levels of Service and delays.

Magnolia Street and Site Driveway

The site driveway intersects Magnolia Street to form an unsignalized T-intersection with the site driveway operating under stop control. The eastbound and westbound approaches of Magnolia Street each provide a dedicated through lane. The northbound approach of the site driveway provides a shared left turn/right turn lane.

A review of the existing analysis reveals that the individual intersection movements operate at Level of Service "A" during the analyzed peak period. See Table II for the individual movement Levels of Service and delays.

FUTURE CONDITIONS

Traffic volumes and operational analyses were developed for both the Future No Build and Build conditions. The No Build conditions provide a baseline for assessing the impact of the site development traffic on the roadway system. The process of developing the No Build and Build traffic volumes and the subsequent analyses is outlined below.

Regardless of whether the subject site is developed or not, traffic volumes on the surrounding roadways are expected to increase as a result of developments throughout the region. A growth rate for roadways within the study area was obtained from the NJDOT Annual Background Growth Rate Table, which indicates a growth rate of 1.50% per year.

Through consultation with the Bergenfield Borough staff, there are no other developments in the vicinity of the site that have been approved but not yet constructed that are identified as significant traffic generators. It was assumed that the background growth rate was adequate to account for the traffic associated with all developments not listed.

Future No Build traffic volumes were developed by applying the background growth rate of 1.50% for two (2) years to the study area roadways existing traffic volumes. Figure 3, in Appendix A, shows the Future No Build traffic volumes.

Traffic Generation

Trip generation projections for The Project were prepared utilizing trip generation research data as published under Land Use Code 937 – Coffee/Donut Shop with Drive Through Window in the Institute of Transportation Engineers' (ITE) publication, *Trip Generation, 11th Edition.* This publication sets forth trip generation rates based on empirical traffic count data conducted at numerous research sites.

According to studies conducted by ITE, traffic associated with LUC 937 is not 100% newly generated. Rather, a portion of the traffic is diverted from the existing traffic stream on the adjacent roadway network. This is because the Dunkin' is not exclusively a destination land use, instead patrons stop on their way to/from other locations such as home or work. ITE identifies a 63% passby traffic percentage, which is also accepted by NJDOT, and was used during the weekday morning peak hour. Table III below details the traffic volumes associated with the existing Dunkin' taking into account the passby credits. Therefore, of the trips generated by the site, the following breakdown of trips is made:

Table III
Existing Trip Generation Considering Passby Traffic

Land Use	Trip Type	AM PSH		
		In	Out	Total
2,517 SF Dunkin' with Drive-Thru Lane	Total	64	64	128
	Passby	40	40	80
	New (Primary)	**24**	**24**	**48**

In this case, in terms of making projections of future traffic volumes, we have the benefit of an existing site that involves simply the inclusion of a drive-thru system. The main result of such a change to an existing Coffee/Donut Shop is the transfer of some existing customers who currently park and walk in to using the drive-thru system, thus reducing parking demand. There will be some component of new customers who will likely be attracted to the site given the convenience of using a drive-thru. Another purpose of implementing a drive-thru system to an existing restaurant is to ensure keeping their existing customer base and not losing them to a restaurant that has a drive-thru. The net result of the addition to the drive-thru will be a projected increase of trip generation of 15% to 20%. The conservative use of this increase is exemplified by the comparison of the ITE trip generation of a Coffee/Donut Shop without a Drive Through Window to a Coffee/Donut Shop with a Drive Through Window which shows no appreciable increase. Therefore, the following Table IV provides the future trip generation of the site and the differential increase in total trips based on a projected trip increase of 20%.

Table IV
Proposed Trip Generation Based on 20% Increase

Land Use	AM PSH		
	In	Out	Total
Dunkin' with Drive-Thru *(Proposed)*	77	77	154

Of these additional trips, 63% will be pass-by trips and not new traffic to the surrounding roadway network. Therefore, of the thirteen (13) new customers to the proposed site, eight (8) will be pass-by and five (5) will be new or primary trips. In other words, the proposed site is projected to add only five (5) vehicles to the surrounding roadway network during the studied peak hour.

To be ultra-conservative and as a sensitivity analysis, the following Table V was prepared to indicate the trip generation of the proposed Coffee/Donut Shop with a Drive Through Window strictly using ITE trip generation rates.

Table V
Proposed Trip Generation Based on ITE Rates

Land Use	AM PSH		
	In	Out	Total
Dunkin' with Drive-Thru *(Proposed)*	110	106	216

This projection is unrealistic because it does not take into consideration the local conditions of the trip generation characteristics of the existing use and represents an unrealistic increase of over 70%. As mentioned previously, it is made strictly for purposes of being ultra-conservative and as a sensitivity analysis.

Trip Generation Comparison

As previously noted, the site is currently occupied by a Dunkin' coffee shop which has been counted to establish the existing trip generation. Tables VI and VII below provides a comparison between the total trips associated with the existing site and the total trips projected for the proposed site improvement based on the two (2) methods described above.

Table VI
Existing vs. Proposed Trip Generation Comparison Based on 20% Increase

Land Use	AM PSH		
	In	Out	Total
Dunkin' Coffee Shop *(Existing – As Counted)*	64	64	128
Dunkin' with Drive-Thru *(Proposed)*	77	77	154
Difference	**+13**	**+13**	**+26**

Table VII
Existing vs. Proposed Trip Generation Comparison based on ITE Rates

Land Use	AM PSH		
	In	Out	Total
Dunkin' Coffee Shop *(Existing – As Counted)*	64	64	128
Dunkin' with Drive-Thru *(Proposed)*	110	106	216
Difference	**+46**	**+42**	**+88**

As mentioned, Table V with the larger trip generation is used for further analysis to be ultra-conservative and as a sensitivity analysis. Once the magnitude of traffic to be generated by the site is known, it is necessary to assign that traffic to the adjacent street system. The distribution of new traffic to the surrounding roadways is based on the location of primary arterial roadways, major signalized intersections and existing traffic patterns. Located in Appendix A, Figures 4-8 illustrate the Primary Traffic Trip Distribution, Primary Site Generated Volumes, Passby Traffic Trip Distribution, Passby Site Generated Volumes, and the Total Site Generated Volumes, respectively. The Total Site Generated Volumes assigned to the study area network were added to the No Build traffic volumes to generate the Build traffic volumes, which are shown in Figure 9.

Future Capacity Analysis

Operational conditions at the study intersections were analyzed under the No Build and Build conditions and are summarized in Table VIII below:

Table VIII
Future Levels of Service

Intersection	Direction/ Movement		AM PSH	
			No Build	Build
South Washington Avenue & Magnolia Street	WB	LR	C (21)	C (25)
	SB	LT	A (9)	A (9)
South Washington Avenue & Site Driveway	WB	LR	C (23)	C (22)
	SB	LT	A (9)	A (9)
Magnolia Street & Site Driveway	NB	LR	A (9)	A (9)
South Washington Avenue & Drive-Thru Entrance	SB	LT	-	A (9)

a (#) - Unsignalized Intersection Level of Service (seconds of delay per vehicle)

South Washington Avenue and Magnolia Street

With the addition of site generated traffic, the individual intersection movements are anticipated to continue operating at Level of Service "C" or better during the analyzed peak hour. See Table VIII for the individual movement Levels of Service and delays.

South Washington Avenue and Site Driveway

With the addition of site generated traffic, the individual intersection movements are anticipated to continue operating at Level of Service "C" or better during the analyzed peak hour. See Table VIII for the individual movement Levels of Service and delays.

Magnolia Street and Site Driveway

With the addition of site generated traffic, the individual intersection movements are anticipated to continue operating at Level of Service "A" during the analyzed peak hour. See Table VIII for the individual movement Levels of Service and delays.

South Washington Avenue and Drive-Thru Entrance

The drive-thru entrance is proposed to intersect South Washington Avenue to form an unsignalized T-intersection with the drive-thru entrance operating as ingress only. The northbound approach of South Washington Avenue is proposed to provide a shared through/right turn lane, while the southbound approach is proposed to proposed to provide a shared left turn/through lane.

As designed, the individual intersection movements are anticipated to operate at Level of Service "A" during the studied peak hour. See Table VIII for the individual movement Levels of Service and delays.

SITE PLAN

Site Access and Circulation

The site plan was reviewed with respect to the site access and on-site circulation design. As noted previously, access to The Project will be provided via one (1) full movement driveway and one (1) ingress only driveway along South Washington Avenue as well as one (1) egress only driveway along Magnolia Street.

The parking lot will be serviced by parking aisles with a width of 10.5' for one-way circulation with access to parallel parking and 24' for two-way circulation with access to 90-degree parking, which are consistent with accepted engineering design standards. Review of the site plan design indicates that the site can sufficiently accommodate, within paved areas, the automobile traffic anticipated.

Drive-Thru

The drive-thru will operate in a counterclockwise direction with the ability to stack eight (8) cars in the drive-thru lane with an additional capacity of five (5) cars in the mobile order lane. As shown in Table V, there is conservatively projected to be 110 entering vehicles during the AM peak hour. Through past experience and consultation with Dunkin' representatives, it is anticipated that 66% of the site traffic will utilize the drive-thru system, 30% of which will be mobile order customers. This equates to a total of 73 vehicles accessing the drive-thru system (66% x 110 cars), 22 of which will be mobile order customers (30% x 73 cars) thus the remaining 51 will be regular drive-thru customers.

Service times at the pick-up window average approximately 20 to 25 seconds. The equates to a capacity of 144 to 180 vehicles that could be processed in a single hour, whereas, the number of vehicles anticipated to access the drive-thru system is 73. Additionally, a queuing analysis was performed which takes into account the hourly drive-thru demand, service time, available queue storage, among other factors. The queuing analysis resulted in a calculated 95th percentile queue length of four (4) vehicles which can be accommodated within the proposed drive-thru queue storage. The Queue Analysis calculations are contained in Appendix D.

As explained previously, the realistic projection of vehicles that will utilize the drive-thru system will be much less than that used for the queue analysis. Therefore, if the drive-thru system works for the ultra-conservative projections, it will work for the more realistic projections.

Parking

The Borough of Bergenfield Ordinance sets forth a minimum parking requirement of 4 parking spaces per 1,000 SF for retail uses plus 1 parking space per three seats for restaurant uses. This equates to a parking requirement of 16 spaces for the proposed 2,517 SF Dunkin' with drive-thru inclusive of 16 seats. The site as proposed provides 16 parking spaces, inclusive of one handicap space, and as such the Ordinance requirement is satisfied.

It is proposed to provide parking stalls with dimensions of 9'x18 for 90-degree spaces and minimum dimensions of 8'x18' for parallel spaces, which do not meet the Ordinance minimum requirement of 9'x18'. However, it is important to note that the parallel spaces will be designated for employees, who will be very familiar with the site circulation patterns and maneuvers required to access the spaces. Therefore, the proposed dimensions will adequately accommodate the anticipated site traffic.

As previously indicated, 2/3 of the total site customer volume will use the drive-thru system and the remainder will utilize the parking. Thus, the reduction in parking demand of the site is reduced by the order of 2/3's.

FINDINGS & CONCLUSIONS

Findings

Based upon the detailed analyses as documented herein, the following findings are noted:

- The proposed 2,517 SF Dunkin' with drive thru is projected to realistically generate 8 entering trips and 8 exiting trips during the weekday morning peak hour that are "new" to the adjacent roadway network, resulting in what can be characterized as an insignificant increase in traffic.

- Access to the site is proposed to be provided via one (1) full movement driveway and one (1) ingress only driveway along South Washington Avenue as well as one (1) egress only driveway along Magnolia Street.

- With the addition of site generated traffic, based on ultra-conservative projections, the individual intersection movements of South Washington Avenue and Magnolia Street are anticipated to continue operating at Level of Service "C" or better during the analyzed peak hour.

- With the addition of site generated traffic, based on ultra-conservative projections, the individual intersection movements of South Washington Avenue and the site driveway are anticipated to continue operating at Level of Service "C" or better during the analyzed peak hour.

- With the addition of site generated traffic, the individual intersection movements of Magnolia Street and the site driveway are anticipated to continue operating at Level of Service "A" during the analyzed peak hour.

- As designed, the individual intersection movements of Magnolia Street and the drive-thru entrance are anticipated to operate at Level of Service "A" during the studied peak hour.

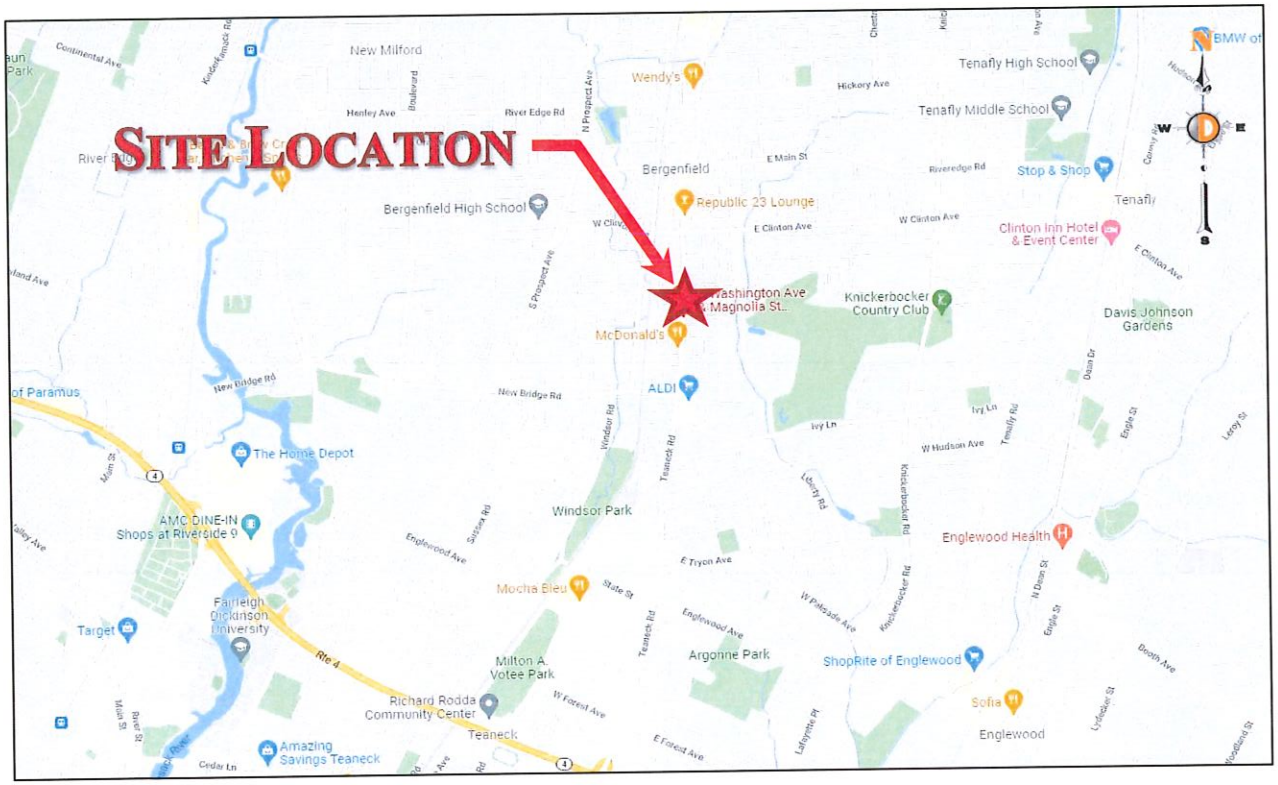
- As proposed, The Project's site driveways and internal circulation have been designed to provide for safe and efficient movement of automobiles.

- The proposed parking supply and design is sufficient to support the projected demand and satisfies the Ordinance requirements.

Conclusions

Based upon our Traffic Impact Study as detailed in the body of this report, it is the professional opinion of Dynamic Traffic, LLC that the adjacent street system of the Borough of Bergenfield and Bergen County will not experience any significant degradation in operating conditions with the construction of The Project. The site driveways are located to provide safe and efficient access to the adjacent roadway system. The site plan as proposed provides for good circulation throughout the site and provides adequate parking to accommodate The Project's needs.

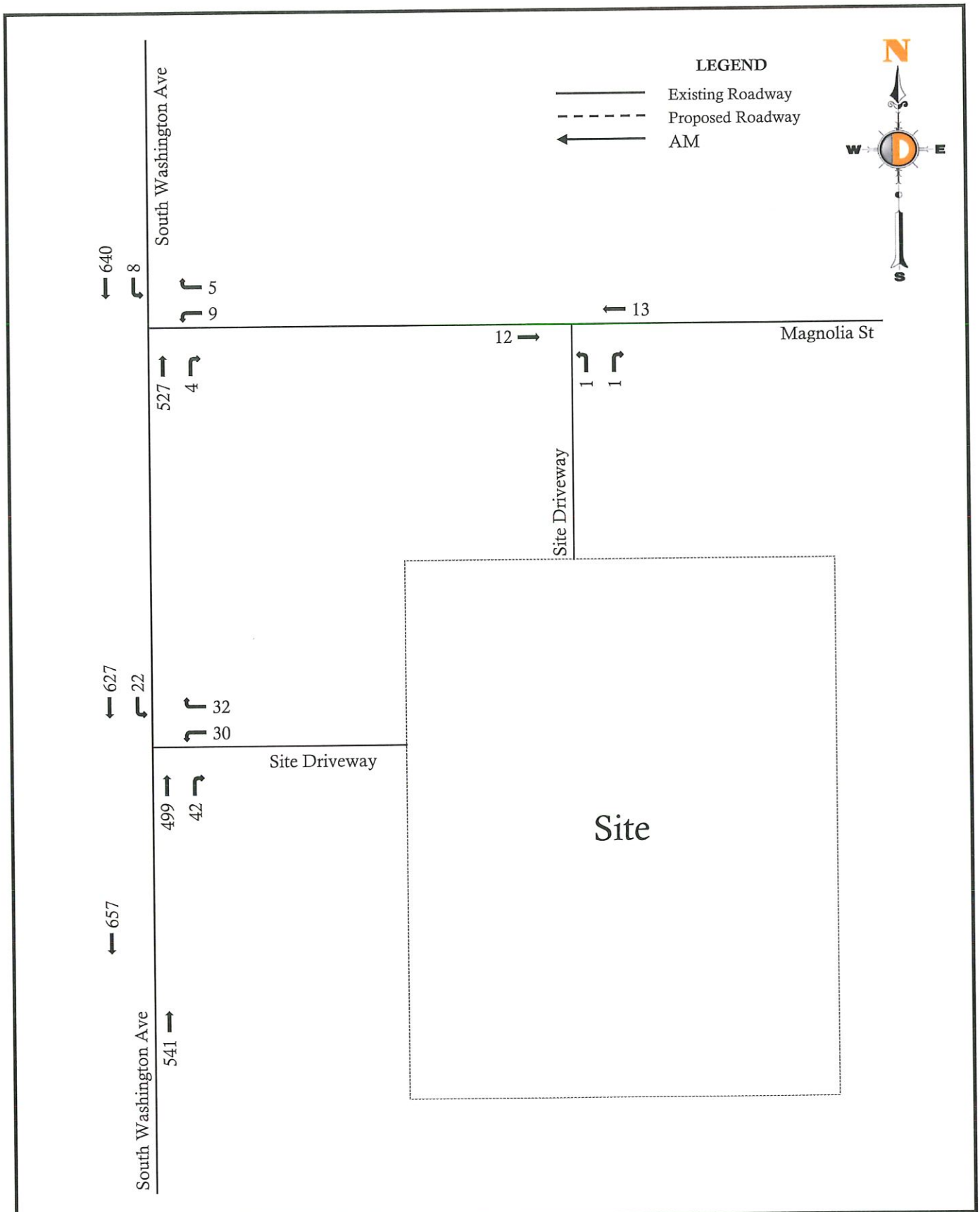
Appendix A
Traffic Volume Figures



Proposed Dunkin Donuts Drive-Thru
Traffic Impact Study
4098-99-001TE

Figure 1

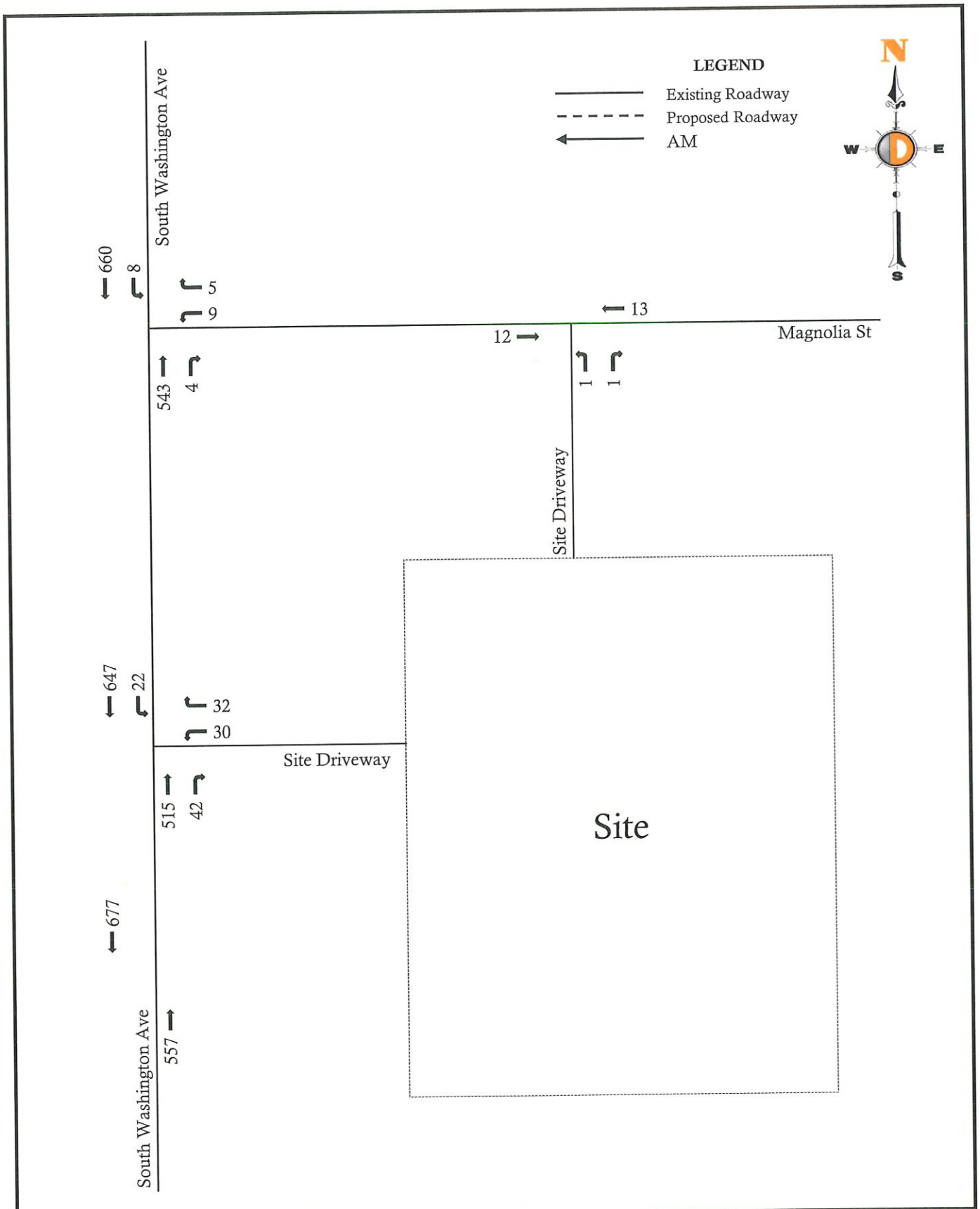
Site Location Map



Proposed Dunkin Donuts Drive-Thru
Traffic Impact Study
4098-99-001TE

Figure 2

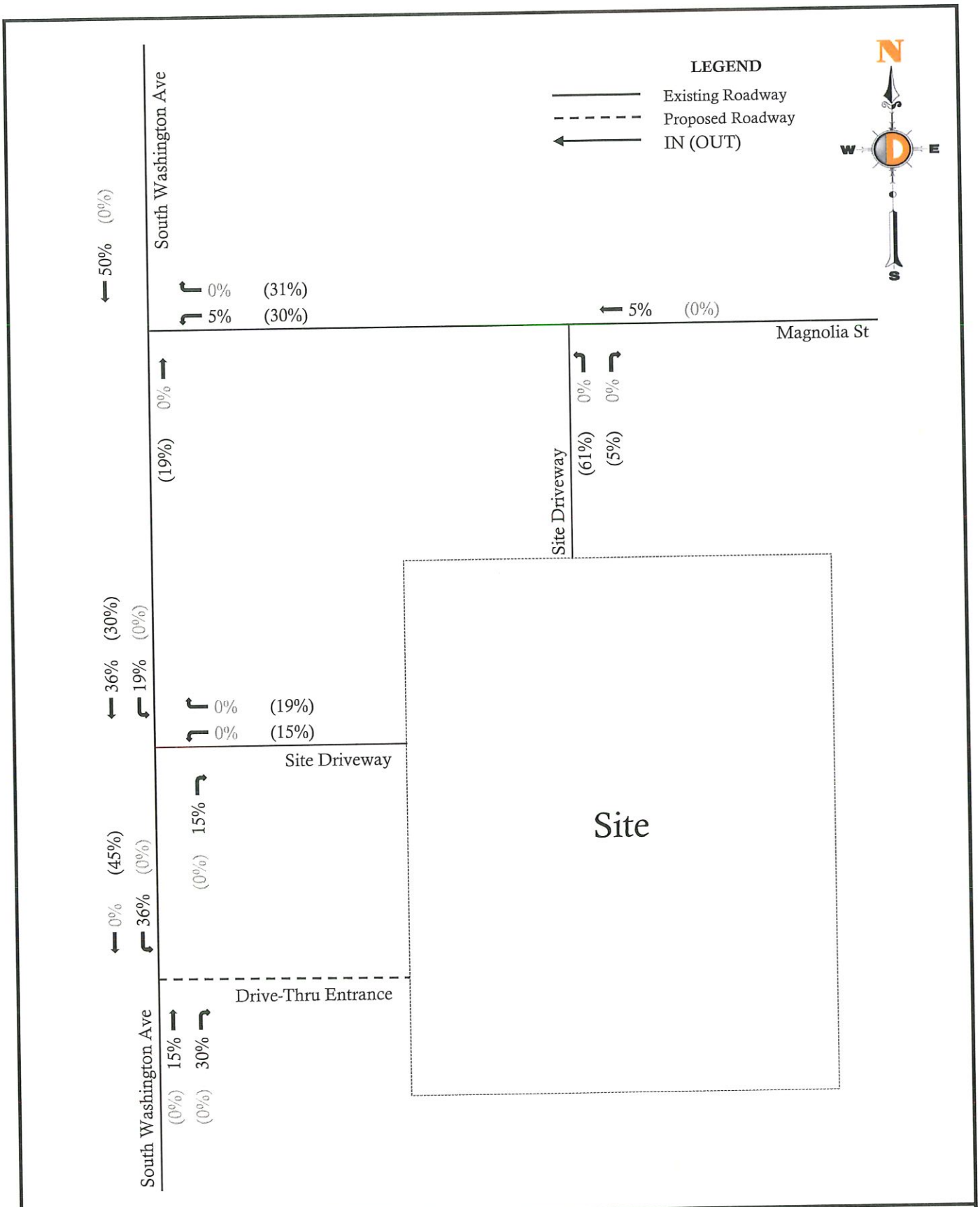
Existing Traffic Volumes



Proposed Dunkin Donuts Drive-Thru
Traffic Impact Study
4098-99-001TE

Figure 3

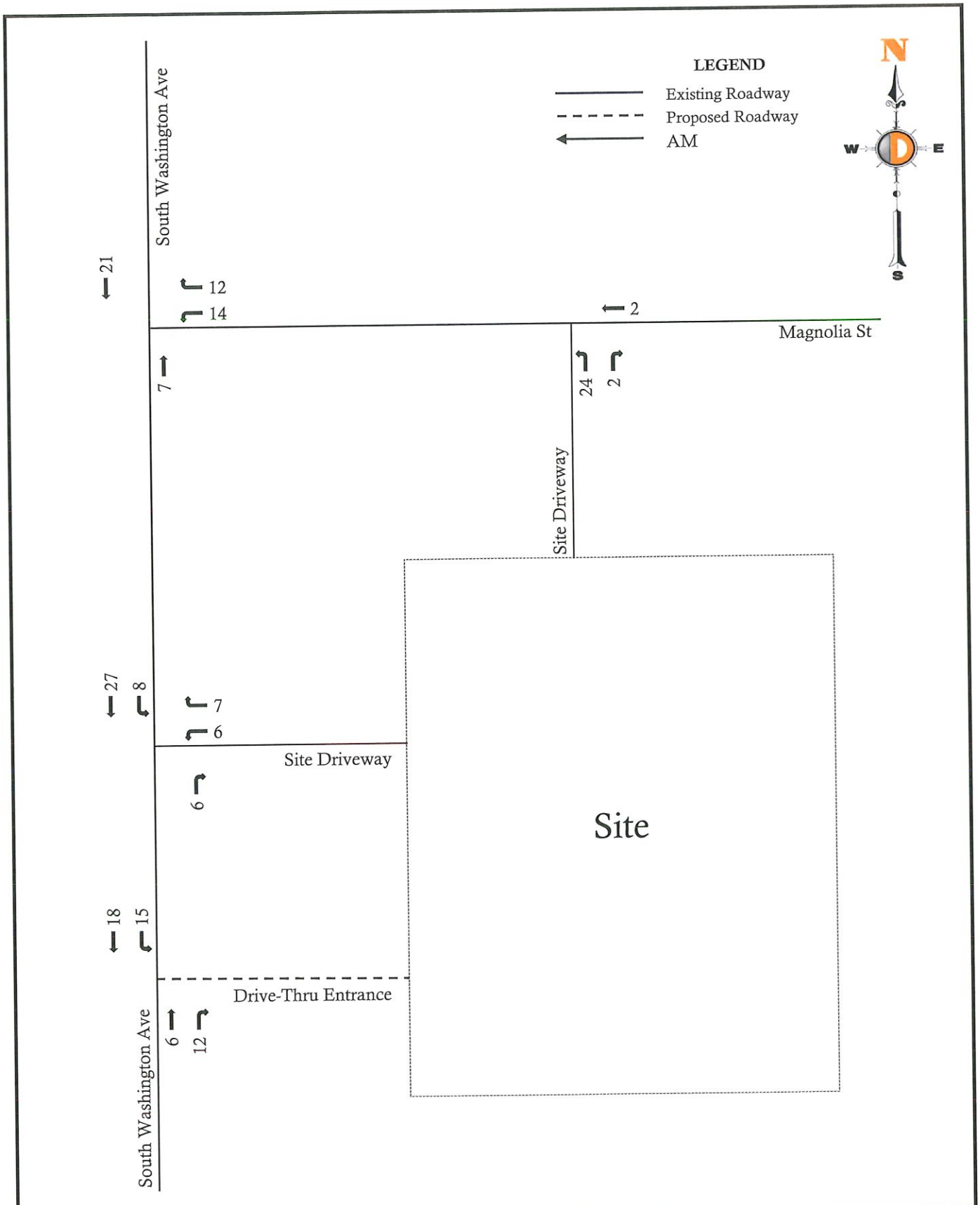
No Build Traffic Volumes



Proposed Dunkin Donuts Drive-Thru
Traffic Impact Study
4098-99-001TE

Figure 4

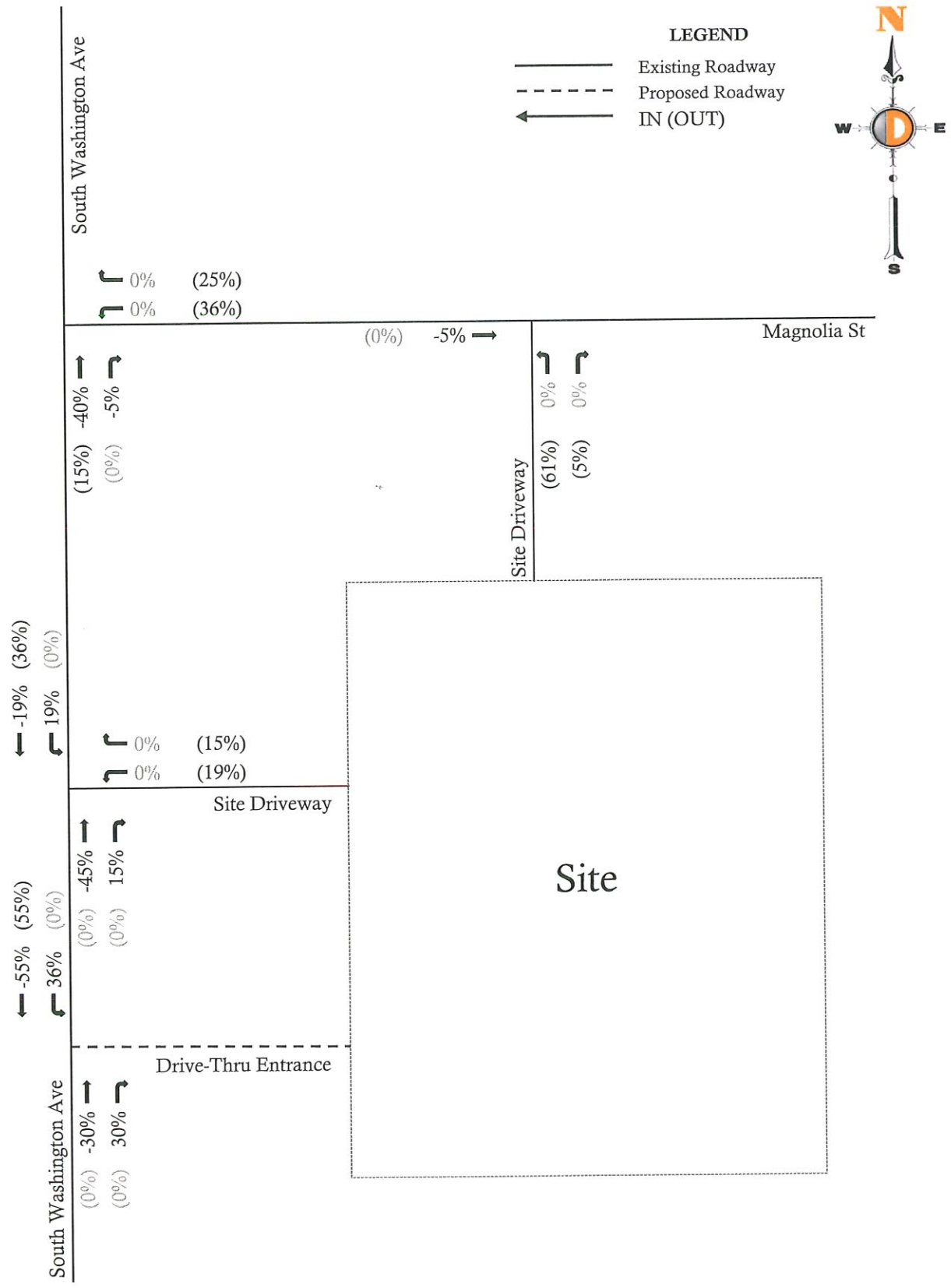
Percent Distribution (Primary Trips)



Proposed Dunkin Donuts Drive-Thru
Traffic Impact Study
4098-99-001TE

Figure 5

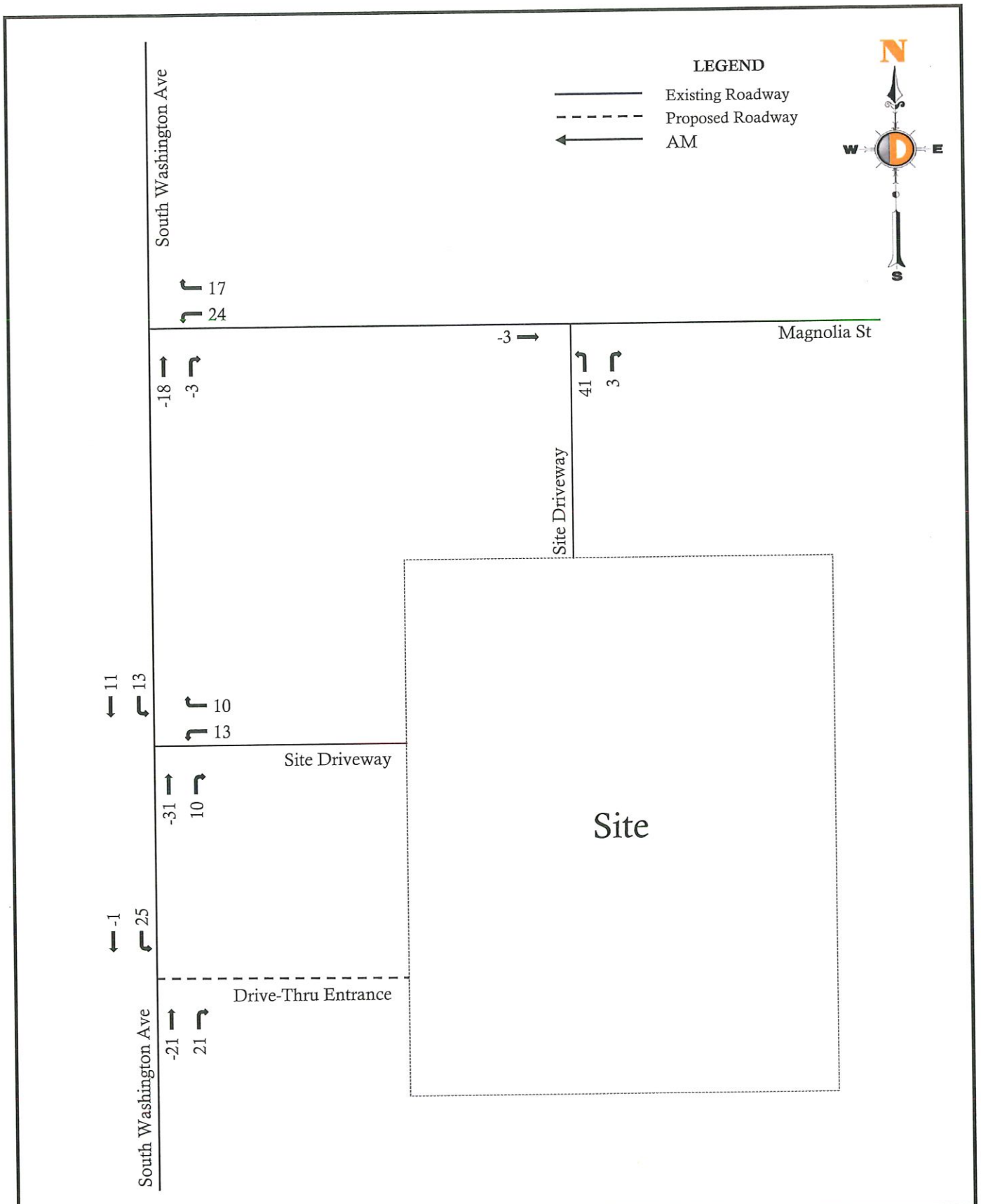
Primary Site Generated Trips



Proposed Dunkin Donuts Drive-Thru
Traffic Impact Study
4098-99-001TE

Figure 6

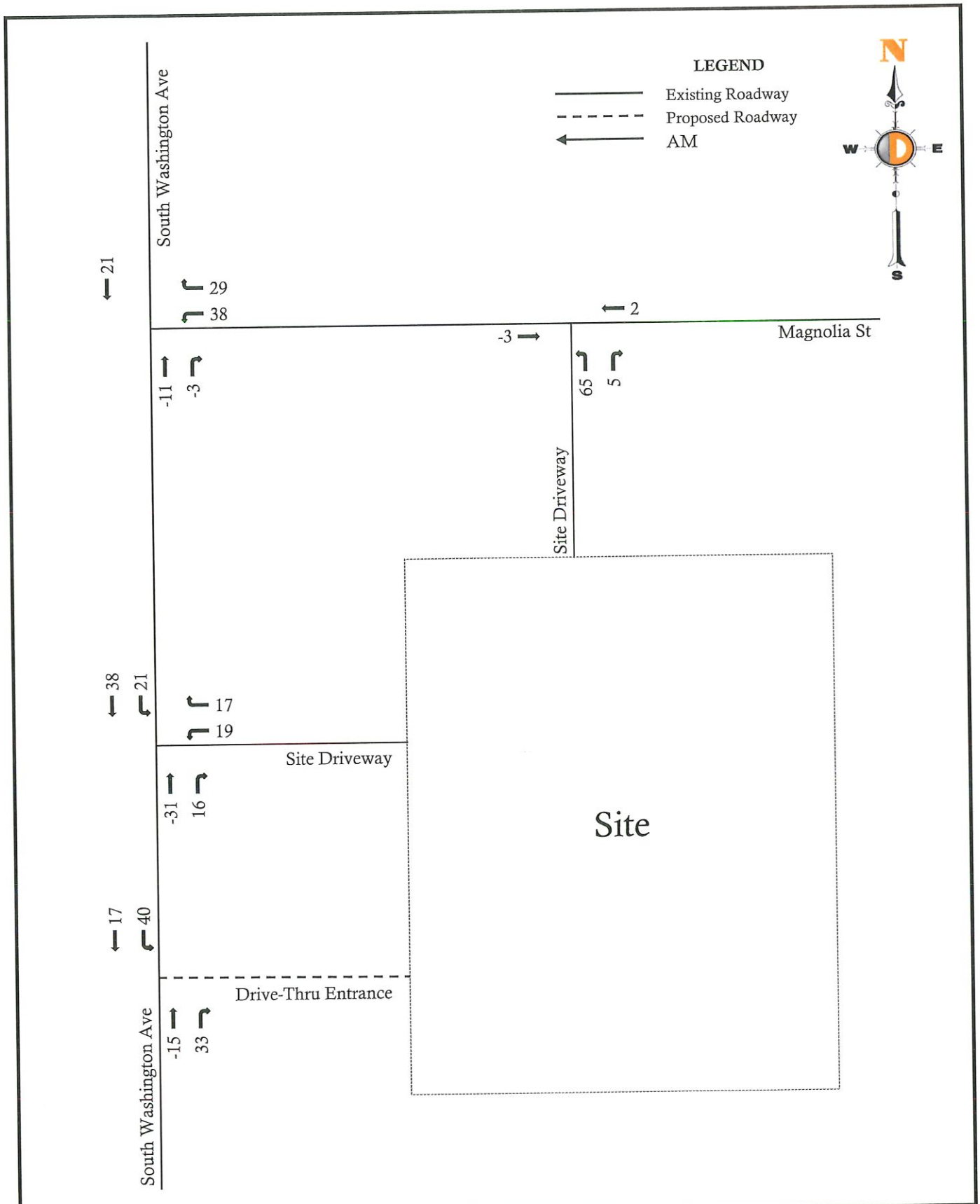
Percent Distribution (Passby Trips)



Proposed Dunkin Donuts Drive-Thru
Traffic Impact Study
4098-99-001TE

Figure 7

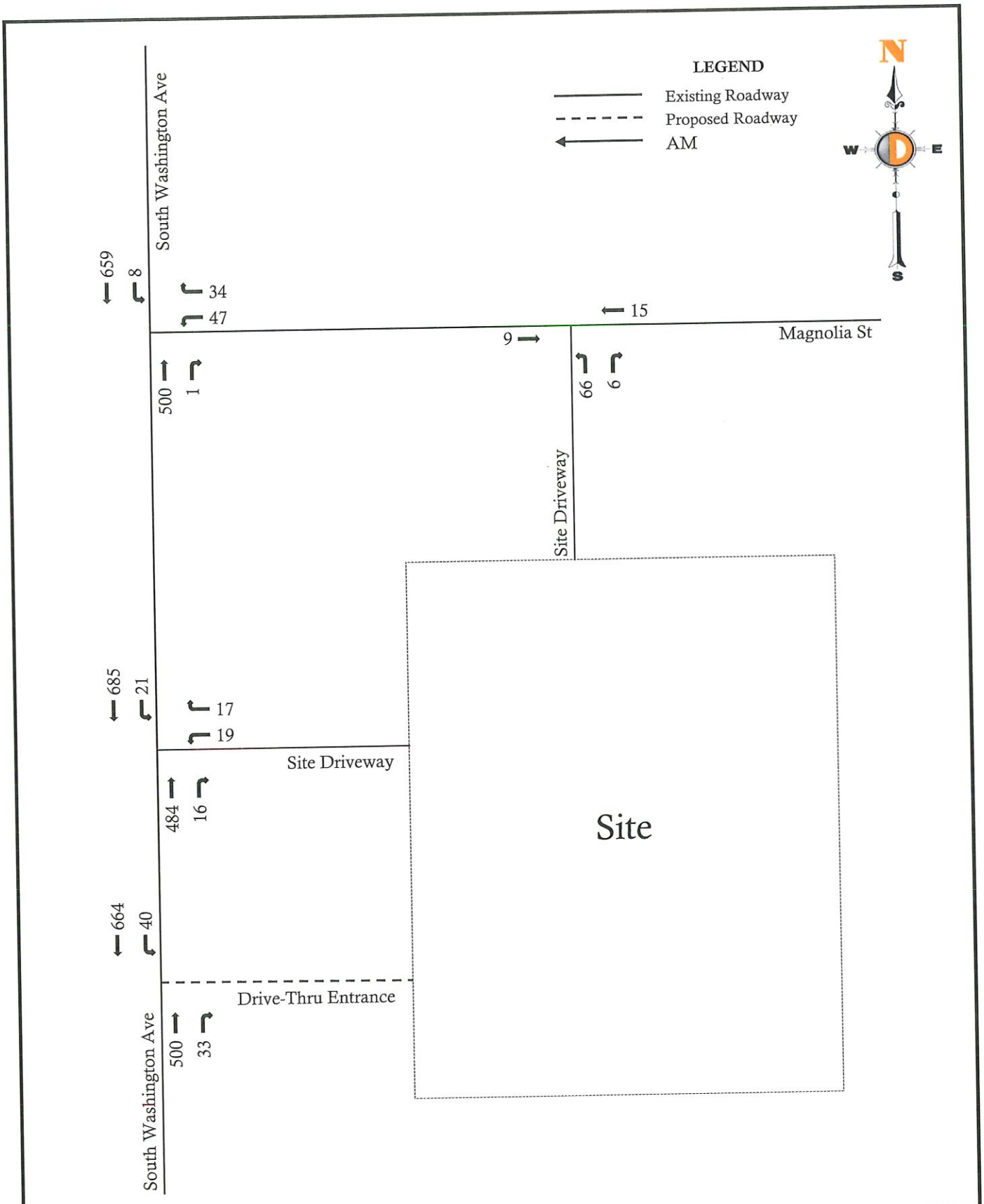
Passby Site Generated Trips



Proposed Dunkin Donuts Drive-Thru
Traffic Impact Study
4098-99-001TE

Figure 8

Total Site Generated Trips



Proposed Dunkin Donuts Drive-Thru
Traffic Impact Study
4098-99-001TE

Figure 9

Build Traffic Volumes

Appendix B
Traffic Counts

Dynamic Traffic, LLC

1904 Main Street, Lake Como, NJ 07719
245 Main Street - Suite #110, Chester, NJ 07930
732-681-0760

E/W: Magnolia Street
N/S: S. Washington Avenue
Town/County: Bergenfield/Bergen
Job #: 4098-99-001TE

File Name : S Washington Ave & Magnolia St - AM
Site Code : 00000000
Start Date : 11/30/2021
Page No : 1

Groups Printed- Cars - Trucks (SU) - Trucks (TT)

	Magnolia Street Westbound					S. Washington Avenue Northbound					S. Washington Avenue Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
07:00 AM	1	0	1	1	3	0	0	2	0	2	0	0	0	1	1	6
07:15 AM	3	0	0	5	8	0	0	4	0	4	3	0	0	0	3	15
07:30 AM	5	0	2	5	12	0	0	2	0	2	4	0	0	2	6	20
07:45 AM	2	0	0	2	4	0	0	0	0	0	2	0	0	1	3	7
Total	11	0	3	13	27	0	0	8	0	8	9	0	0	4	13	48
08:00 AM	0	0	2	2	4	0	0	2	0	2	1	0	0	0	1	7
08:15 AM	2	0	0	3	5	0	0	0	0	0	1	0	0	2	3	8
08:30 AM	1	0	0	0	1	0	0	0	0	0	1	0	0	0	1	2
08:45 AM	1	0	1	2	4	0	0	1	0	1	0	0	0	2	2	7
Total	4	0	3	7	14	0	0	3	0	3	3	0	0	4	7	24
Grand Total	15	0	6	20	41	0	0	11	0	11	12	0	0	8	20	72
Apprch %	36.6	0	14.6	48.8		0	0	100	0		60	0	0	40		
Total %	20.8	0	8.3	27.8	56.9	0	0	15.3	0	15.3	16.7	0	0	11.1	27.8	
Cars	15	0	6	20	41	0	0	11	0	11	12	0	0	8	20	72
% Cars	100	0	100	100	100	0	0	100	0	100	100	0	0	100	100	100
Trucks (SU)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Trucks (SU)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Trucks (TT)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Trucks (TT)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Dynamic Traffic, LLC

1904 Main Street, Lake Como, NJ 07719
245 Main Street - Suite #110, Chester, NJ 07930
732-681-0760

E/W: Driveway
N/S: S. Washington Avenue
Town/County: Bergenfield/Bergen
Job #: 4098-99-001TE

File Name : S Washington Ave & Driveway - AM
Site Code : 00000000
Start Date : 11/30/2021
Page No : 1

Groups Printed- Cars - Trucks (SU) - Trucks (TT)

	Driveway Westbound					S. Washington Avenue Northbound					S. Washington Avenue Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
07:00 AM	7	0	5	1	13	0	105	10	0	115	4	108	0	0	112	240
07:15 AM	8	0	5	5	18	0	97	9	0	106	5	148	0	0	153	277
07:30 AM	10	0	7	5	22	0	115	13	0	128	7	177	0	0	184	334
07:45 AM	4	0	8	2	14	0	139	9	0	148	2	155	0	0	157	319
Total	29	0	25	13	67	0	456	41	0	497	18	588	0	0	606	1170
08:00 AM	9	0	10	2	21	0	126	13	0	139	8	153	0	0	161	321
08:15 AM	7	0	7	3	17	0	119	7	0	126	5	142	0	0	147	290
08:30 AM	9	0	10	0	19	0	116	9	0	125	11	147	0	0	158	302
08:45 AM	9	0	14	2	25	0	134	10	0	144	8	157	0	0	165	334
Total	34	0	41	7	82	0	495	39	0	534	32	599	0	0	631	1247
Grand Total	63	0	66	20	149	0	951	80	0	1031	50	1187	0	0	1237	2417
Apprch %	42.3	0	44.3	13.4		0	92.2	7.8	0		4	96	0	0		
Total %	2.6	0	2.7	0.8	6.2	0	39.3	3.3	0	42.7	2.1	49.1	0	0	51.2	
Cars	63	0	66	20	149	0	879	80	0	959	50	1116	0	0	1166	2274
% Cars	100	0	100	100	100	0	92.4	100	0	93	100	94	0	0	94.3	94.1
Trucks (SU)	0	0	0	0	0	0	68	0	0	68	0	66	0	0	66	134
% Trucks (SU)	0	0	0	0	0	0	7.2	0	0	6.6	0	5.6	0	0	5.3	5.5
Trucks (TT)	0	0	0	0	0	0	4	0	0	4	0	5	0	0	5	9
% Trucks (TT)	0	0	0	0	0	0	0.4	0	0	0.4	0	0.4	0	0	0.4	0.4

Appendix C
Capacity Analysis

Intersection	
Int Delay, s/veh	0.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	9	5	527	4	8	640
Future Vol, veh/h	9	5	527	4	8	640
Conflicting Peds, #/hr	0	5	0	12	12	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	-1	-	-1	-	-	1
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	0	8	0	0	5
Mvmt Flow	10	5	561	4	9	681

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1274	580	0	0	577	0
Stage 1	575	-	-	-	-	-
Stage 2	699	-	-	-	-	-
Critical Hdwy	6.2	6.1	-	-	4.1	-
Critical Hdwy Stg 1	5.2	-	-	-	-	-
Critical Hdwy Stg 2	5.2	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	200	526	-	-	1006	-
Stage 1	585	-	-	-	-	-
Stage 2	516	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	194	516	-	-	991	-
Mov Cap-2 Maneuver	194	-	-	-	-	-
Stage 1	576	-	-	-	-	-
Stage 2	508	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	20.3	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	250	991	-
HCM Lane V/C Ratio	-	-	0.06	0.009	-
HCM Control Delay (s)	-	-	20.3	8.7	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0	-

Intersection	
Int Delay, s/veh	0.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	9	5	543	4	8	660
Future Vol, veh/h	9	5	543	4	8	660
Conflicting Peds, #/hr	0	5	0	12	12	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	-1	-	-1	-	-	1
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	0	8	0	0	5
Mvmt Flow	10	5	578	4	9	702

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1312	597	0	0	594	0
Stage 1	592	-	-	-	-	-
Stage 2	720	-	-	-	-	-
Critical Hdwy	6.2	6.1	-	-	4.1	-
Critical Hdwy Stg 1	5.2	-	-	-	-	-
Critical Hdwy Stg 2	5.2	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	190	515	-	-	992	-
Stage 1	575	-	-	-	-	-
Stage 2	506	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	184	505	-	-	977	-
Mov Cap-2 Maneuver	184	-	-	-	-	-
Stage 1	566	-	-	-	-	-
Stage 2	498	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	21.1	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	238	977	-
HCM Lane V/C Ratio	-	-	0.063	0.009	-
HCM Control Delay (s)	-	-	21.1	8.7	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0	-

Intersection	
Int Delay, s/veh	1.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	47	34	500	1	8	659
Future Vol, veh/h	47	34	500	1	8	659
Conflicting Peds, #/hr	0	5	0	12	12	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	-1	-	-1	-	-	1
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	0	8	0	0	5
Mvmt Flow	50	36	532	1	9	701

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1264	550	0	0	545	0
Stage 1	545	-	-	-	-	-
Stage 2	719	-	-	-	-	-
Critical Hdwy	6.2	6.1	-	-	4.1	-
Critical Hdwy Stg 1	5.2	-	-	-	-	-
Critical Hdwy Stg 2	5.2	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	203	547	-	-	1034	-
Stage 1	603	-	-	-	-	-
Stage 2	506	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	197	536	-	-	1018	-
Mov Cap-2 Maneuver	197	-	-	-	-	-
Stage 1	594	-	-	-	-	-
Stage 2	499	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	24.7	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	268	1018	-
HCM Lane V/C Ratio	-	-	0.322	0.008	-
HCM Control Delay (s)	-	-	24.7	8.6	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	1.3	0	-

Intersection	
Int Delay, s/veh	0.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	12	0	0	13	1	1
Future Vol, veh/h	12	0	0	13	1	1
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, %	-1	-	-	1	0	-
Peak Hour Factor	48	48	48	48	48	48
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	25	0	0	27	2	2

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	-	-	-	52	25
Stage 1	-	-	-	-	25	-
Stage 2	-	-	-	-	27	-
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	-	962	1057
Stage 1	-	0	0	-	1003	-
Stage 2	-	0	0	-	1001	-
Platoon blocked, %	-			-		
Mov Cap-1 Maneuver	-	-	-	-	962	1057
Mov Cap-2 Maneuver	-	-	-	-	962	-
Stage 1	-	-	-	-	1003	-
Stage 2	-	-	-	-	1001	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	8.6
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	WBT
Capacity (veh/h)	1007	-	-
HCM Lane V/C Ratio	0.004	-	-
HCM Control Delay (s)	8.6	-	-
HCM Lane LOS	A	-	-
HCM 95th %tile Q(veh)	0	-	-

Intersection	
Int Delay, s/veh	0.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	Y	
Traffic Vol, veh/h	12	0	0	13	1	1
Future Vol, veh/h	12	0	0	13	1	1
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, %	-1	-	-	1	0	-
Peak Hour Factor	48	48	48	48	48	48
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	25	0	0	27	2	2

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	-	-	-	52	25
Stage 1	-	-	-	-	25	-
Stage 2	-	-	-	-	27	-
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	-	962	1057
Stage 1	-	0	0	-	1003	-
Stage 2	-	0	0	-	1001	-
Platoon blocked, %	-			-		
Mov Cap-1 Maneuver	-	-	-	-	962	1057
Mov Cap-2 Maneuver	-	-	-	-	962	-
Stage 1	-	-	-	-	1003	-
Stage 2	-	-	-	-	1001	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	8.6
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	WBT
Capacity (veh/h)	1007	-	-
HCM Lane V/C Ratio	0.004	-	-
HCM Control Delay (s)	8.6	-	-
HCM Lane LOS	A	-	-
HCM 95th %tile Q(veh)	0	-	-

Intersection	
Int Delay, s/veh	7.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	Y	
Traffic Vol, veh/h	9	0	0	15	66	6
Future Vol, veh/h	9	0	0	15	66	6
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, %	-1	-	-	1	0	-
Peak Hour Factor	48	48	48	48	48	48
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	19	0	0	31	138	13

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	-	-	-	50	19
Stage 1	-	-	-	-	19	-
Stage 2	-	-	-	-	31	-
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	-	964	1065
Stage 1	-	0	0	-	1009	-
Stage 2	-	0	0	-	997	-
Platoon blocked, %	-			-		
Mov Cap-1 Maneuver	-	-	-	-	964	1065
Mov Cap-2 Maneuver	-	-	-	-	964	-
Stage 1	-	-	-	-	1009	-
Stage 2	-	-	-	-	997	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	9.4
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	WBT
Capacity (veh/h)	972	-	-
HCM Lane V/C Ratio	0.154	-	-
HCM Control Delay (s)	9.4	-	-
HCM Lane LOS	A	-	-
HCM 95th %tile Q(veh)	0.5	-	-

Intersection	
Int Delay, s/veh	1.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	30	32	499	42	22	627
Future Vol, veh/h	30	32	499	42	22	627
Conflicting Peds, #/hr	0	0	0	12	12	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	1	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	8	0	0	5
Mvmt Flow	32	34	525	44	23	660

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1265	559	0	0	581	0
Stage 1	559	-	-	-	-	-
Stage 2	706	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	189	532	-	-	1003	-
Stage 1	576	-	-	-	-	-
Stage 2	493	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	180	526	-	-	992	-
Mov Cap-2 Maneuver	180	-	-	-	-	-
Stage 1	570	-	-	-	-	-
Stage 2	475	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	22.3	0	0.3
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	273	992	-
HCM Lane V/C Ratio	-	-	0.239	0.023	-
HCM Control Delay (s)	-	-	22.3	8.7	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	0.9	0.1	-

Intersection	
Int Delay, s/veh	1.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	30	32	515	42	22	647
Future Vol, veh/h	30	32	515	42	22	647
Conflicting Peds, #/hr	0	0	0	12	12	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	1	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	8	0	0	5
Mvmt Flow	32	34	542	44	23	681

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1303	576	0	0	598	0
Stage 1	576	-	-	-	-	-
Stage 2	727	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	179	521	-	-	989	-
Stage 1	566	-	-	-	-	-
Stage 2	482	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	170	515	-	-	978	-
Mov Cap-2 Maneuver	170	-	-	-	-	-
Stage 1	560	-	-	-	-	-
Stage 2	464	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	23.4	0	0.3
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	260	978	-
HCM Lane V/C Ratio	-	-	0.251	0.024	-
HCM Control Delay (s)	-	-	23.4	8.8	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	1	0.1	-

Intersection	
Int Delay, s/veh	0.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	19	17	484	16	21	685
Future Vol, veh/h	19	17	484	16	21	685
Conflicting Peds, #/hr	0	0	0	12	12	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	1	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	8	0	0	5
Mvmt Flow	20	18	509	17	22	721

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1295	530	0	0	538	0
Stage 1	530	-	-	-	-	-
Stage 2	765	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	181	553	-	-	1040	-
Stage 1	594	-	-	-	-	-
Stage 2	463	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	172	547	-	-	1028	-
Mov Cap-2 Maneuver	172	-	-	-	-	-
Stage 1	587	-	-	-	-	-
Stage 2	446	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	21.6	0	0.3
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	254	1028	-
HCM Lane V/C Ratio	-	-	0.149	0.022	-
HCM Control Delay (s)	-	-	21.6	8.6	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	0.5	0.1	-

Intersection	
Int Delay, s/veh	0.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	500	33	40	664
Future Vol, veh/h	0	0	500	33	40	664
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	1	-	-	0
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	0	7	0	0	5
Mvmt Flow	0	0	521	34	42	692

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	538	0	0	555	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.2	-	-	4.1	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	0	547	-	-	1026	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	547	-	-	1026	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0.5
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	1026	-
HCM Lane V/C Ratio	-	-	-	0.041	-
HCM Control Delay (s)	-	-	0	8.7	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	-	0.1	-

Appendix D
Queue Analysis

DYNAMIC TRAFFIC

QUEUE CALCULATION - SINGLE SERVICE LANE

Dunkin Donuts - Bergenfield

Job Info	
Project Number:	4098-99-001TE
Project Description:	Edilberto G Jimenez
Analyst:	CGH
Date:	12/9/2021

Traffic Demand		
Hourly Demand, v	73	veh/hr
Peak Hour Factor, PHF	0.96	
Available Queue Storage	8	veh

Service Rate		
Service Time	25	sec/veh

Calculations		
Pk Flow Rate, λ = v / PHF	76	veh/hr
Service Rate per Hour, μ	144.0	veh/hr
Traffic intensity, ρ = λ / μ	0.53	

**Model produces unreliable results when ρ is less than 0.5 or greater than 0.85*[1]

Avg. Queue Length, $L_q = (\rho \times \lambda) / (\mu-\lambda)$	0.59	veh.
Avg. System Length, $L_s = \lambda / (\mu-\lambda)$	1.12	veh.
Avg. Queue Waiting Time, $W_q = \rho / (\mu-\lambda)$	0.47	min.
Avg. Time in System, $W_s = 1 / (\mu-\lambda)$	0.88	min.
95th Percentile Queue:	4	
Probability of queue exceeding 8 vehicles:	0.32%	

Notes

- Queue calculations assume one service lane.
- Queue calculations based on stochastic queueing methods as described by M/M/1 Single-Server Queue Model as presented in "Parking" as published by the ENO foundation(1) and within the Civil Engineering Reference Manual.
- System times and length includes time/presence at service point.

Probability Calculations

X' Veh. in Queue	P{X} Probability of exactly 'X' Veh. in Queue	Probability of 'X' or less Veh. in Queue	Probability of Queue Greater than 'X' Veh.	95th Percentile Queue
0	47.22%	47.22%	52.78%	
1	24.92%	72.15%	27.85%	
2	13.15%	85.30%	14.70%	
3	6.94%	92.24%	7.76%	
4	3.66%	95.90%	4.10%	4
5	1.93%	97.84%	2.16%	
6	1.02%	98.86%	1.14%	
7	0.54%	99.40%	0.60%	
8	0.28%	99.68%	0.32%	
9	0.15%	99.83%	0.17%	
10	0.08%	99.91%	0.09%	
11	0.04%	99.95%	0.05%	
12	0.02%	99.98%	0.02%	
13	0.01%	99.99%	0.01%	
14	0.01%	99.99%	0.01%	
15	0.00%	100.00%	0.00%	
16	0.00%	100.00%	0.00%	
17	0.00%	100.00%	0.00%	
18	0.00%	100.00%	0.00%	
19	0.00%	100.00%	0.00%	
20	0.00%	100.00%	0.00%	
21	0.00%	100.00%	0.00%	
22	0.00%	100.00%	0.00%	
23	0.00%	100.00%	0.00%	
24	0.00%	100.00%	0.00%	
25	0.00%	100.00%	0.00%	