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October 9, 2020

Township of Montgomery
Zoning Board of Adjustment
2261 Van Horne Road – Route 206 North
Belle Mead, NJ 08502

**RE: Traffic Impact Assessment
Proposed Dunkin' Restaurant
Route 206 & Georgetown-Franklin
Turnpike (CR 518)
Township of Montgomery
Somerset County, NJ
DT# 3334-99-001TE**

Dear Board Members:

Dynamic Traffic has prepared the following assessment to determine the traffic impact and adequacy of access, circulation, and parking associated with redevelopment of a site located in the northwest quadrant of the intersection of Route 206 with County Route (CR) 518 (Georgetown-Franklin Turnpike) in the Township of Montgomery, Somerset County, New Jersey (see Figure 1). The site is designated as Block 28005 – Lot 64 on the Montgomery Township Tax Maps. The site was previously developed with a gasoline service station and has also received a prior approval for a Dunkin' Restaurant which is being modified with this Application. The existing access to the site which served the gas station is provided via two (2) driveways along Route 206 and one (1) driveway along CR 518.

The current development proposal includes the construction of a 1,823 square foot Dunkin' Restaurant with Drive-Thru. Pursuant to direction from NJDOT and Somerset County, access will be provided via one (1) right-in driveway along Route 206 and one (1) right-in/right-out driveway along CR 518. The site will be served by 17 parking spaces and a dual drive-thru lane.

Existing Conditions

Route 206 is an urban principal arterial roadway under New Jersey Department of Transportation (NJDOT) jurisdiction with a general north/south alignment and a 35 MPH posted speed limit in the site vicinity. The roadway is also known as Van Horne Memorial Highway. Generally, one lane of travel is provided in each direction with turning lanes at key intersections. The land uses along Route 206 within the study area are predominantly commercial.

Georgetown-Franklin Turnpike (CR 518) is an Urban Minor Arterial roadway under Somerset County jurisdiction. In the vicinity of the site the posted speed limit is 45 MPH and the roadway

provides one travel lane in each direction. On-street parking is prohibited along both sides of the roadway. Curb is provided along the both sides of the roadway with the exception of the subject site frontage. Sidewalk is not provided along either side of the roadway. Georgetown-Franklin Turnpike provides a straight horizontal alignment and a relatively flat vertical alignment.

Route 206 & CR 518 intersect to form a four leg, signalized intersection. Each approach provides an exclusive left-turn lane and a shared through/right-turn lane.

Future No Build Traffic Volumes

At the time of the preparation of this report, COVID-19 restrictions were in place and causing a substantial deviation from typical traffic volumes. Therefore, obtaining updated turning movement counts would not be representative of typical conditions. Historical count data is available at the subject intersection and can be utilized to generate representative future conditions based on a background growth of 1.25%, identified from the New Jersey Department of Transportation Annual Background Growth Rate Table. Therefore, the following steps were taken to generate the 2022 Future No Build traffic volumes which establish a baseline for analysis purposes:

- Weekday morning peak hour traffic volumes were obtained from the July 18, 2013 Traffic Impact Study prepared by Harlyn Associates for the initial development application. It is noted that updated counts were conducted in 2014 and found to be lower than the 2013 counts. This demonstrates that the NJDOT growth rate is conservative. The Harlyn Associates traffic volumes were grown at a rate of 1.25% per year for nine (9) years to establish the 2022 base volumes for the weekday morning peak hour.
- Weekday evening peak hour and Saturday midday peak hour traffic volumes were obtained from data prepared by our office in connection with the Sharbell Kepner – Tregoe Tract residential development (Sharbell development) currently under construction to the west of the subject property at CR 518 and Research Road. Specifically, a May 7, 2019 Technical Memorandum identified 2019 traffic volumes inclusive of several adjacent developments, without consideration of the Madison Marquette development which has not yet begun construction. The Future Build volumes from that memorandum, which include the Sharbell development, were grown by 1.25% for three (3) years to establish the 2022 Future No Build traffic volumes for the weekday evening and Saturday midday peak hours.
- Traffic volumes from the Sharbell development as well as adjacent developments identified in that report (Baker Auto, Enrollment Management Associates, Montgomery Walk, King Interest Montgomery Redevelopment), were added to the 2022 weekday morning peak hour base volumes to establish the 2022 Future No Build traffic volumes for the weekday morning peak hour.

Future No Build traffic volumes are shown in Figure 2 in Appendix A.

Site Generated Traffic

Trip generation projections for The Project were made utilizing trip generation research data as published under Land Use Code 937 – Coffee/Donut Shop with Drive-Thru Window in the Institute of Transportation Engineers' (ITE) publication, *Trip Generation, 10th Edition*. This publication sets forth trip generation rates based on traffic counts conducted at research sites throughout the country. The following table shows the anticipated trip generation for The Project.

Table I
Trip Generation

Use	AM PSH			PM PSH			Sat PSH		
	In	Out	Total	In	Out	Total	In	Out	Total
1,823 SF Dunkin' with Drive-Thru	88	91	179	40	39	79	80	80	160

It is important to note that traffic associated with coffee/donut shops including Dunkin' facilities is not 100% newly generated. Rather, a portion of the traffic is diverted from the existing traffic stream on the adjacent roadway network. Pursuant to passby percentages accepted by NJDOT a 63% passby traffic percentage was used during the morning peak hour, a 66% passby traffic percentage was used during the evening peak hour, and a 50% passby traffic percentage was used during the Saturday peak hour. Realistically, in more congested locations, along commuter corridors and during peak commuting time periods, the percentage of pass-by traffic likely approaches 100% and the utilization of the NJDOT accepted rates allows a conservative evaluation of off-site traffic impacts.

Table II below details the traffic volumes associated with the subject project taking into account the NJDOT approved passby credits.

Table II
Trip Generation Considering Passby Traffic

Trip Type	AM PSH			PM PSH			Sat PSH		
	In	Out	Total	In	Out	Total	In	Out	Total
Primary	32	35	67	14	13	27	40	40	80
Passby	56	56	112	26	26	52	40	40	80
Total	88	91	179	40	39	79	80	80	160

As mentioned above, the site is currently developed with an abandoned gasoline service station. However, in order to perform conservative analysis no credit has been taken for the trip generation associated with the prior use.

Located in Appendix A, Figures 3 and 4 illustrate the primary and passby site traffic distributions. Figures 5 and 6 illustrate the primary and passby site traffic volumes, and Figure 7 illustrates the total site traffic volumes.

Future Traffic Volumes

The total site generated traffic volumes shown in Figure 7 were added to the 2022 Future No Build traffic volumes shown in Figure 2 in order to establish the 2022 Future Build traffic volumes as shown in Figure 8.

Capacity Analysis

Capacity analyses were conducted for the intersection of Route 206 with CR 518 under the No Build and Build conditions, as well as the site driveway intersection with CR 518 under the Build condition. The analyses were performed for the weekday morning, evening, and Saturday midday peak hours. The analyses were prepared using the SYNCHRO software package as well as the Highway Capacity Software (HCS). All analysis printouts are contained in Appendix C. The Future No Build and

Future Build analyses were compared to the NJDOT Level of Service Degradation Standards as found in the State Highway Access Management Code (N.J.A.C. 16:47). Where the standards were violated, traffic signal timing mitigation was analyzed. The NJDOT standards are detailed and tabulated in Appendix C. The following table summarizes the results of the capacity analyses in terms of Level of Service (LOS) and delay (seconds per vehicle).

Table III
2022 Levels of Service

Intersection	Direction/ Movement		AM PSH									PM PSH									SAT PSH								
			No Build			Build			Bld. w/ Mit.			No Build			Build			Bld. w/ Mit.			No Build			Build			Bld. w/ Mit.		
			LOS	Delay		LOS	Delay		LOS	Delay		LOS	Delay		LOS	Delay		LOS	Delay		LOS	Delay		LOS	Delay		LOS	Delay	
Route 206 & CR 518	EB	L	D	48.6	D	48.6	E	56.3	E	63.2	E	63.2	E	62.7	D	35.8	D	35.8	D	41.6									
		TR	F	97.1	F	97.1	F	89.4	F	92.5	F	92.5	F	83.1	E	58.5	E	58.5	D	53.9									
	WB	L	D	50.8	D	50.8	E	55.6	C	25.7	C	25.7	C	25.2	C	24.2	C	24.2	C	24.6									
		TR	F	85.5	F	88.7	F	80.9	F	180.6	F	184.0	F	165.4	F	243.9	F	253.7	F	224.1									
	NB	L	F	118.5	F	134.2	F	113.1	D	39.0	D	40.7	D	40.2	D	47.8	E	57.4	D	50.5									
		TR	C	27.1	C	27.1	C	27.5	C	32.6	C	32.6	D	35.3	C	23.7	C	23.7	C	24.7									
	SB	L	B	19.1	B	19.1	B	18.9	F	127.9	F	128.0	F	128.1	F	159.1	F	159.1	F	139.8									
		TR	E	56.7	E	56.7	E	60.6	D	50.9	D	54.4	E	56.2	E	64.7	E	64.7	E	68.5									
	Overall		E	59.8	E	61.5	E	59.5	F	80.1	F	80.9	E	78.1	F	87.4	F	89.8	F	83.7									
CR 518 & Site	EB	L	N/A	N/A	A	8.9	A	8.9	N/A	N/A	A	9.1	A	9.1	N/A	N/A	A	8.9	A	8.9									
	SB	R	N/A	N/A	B	14.8	B	14.8	N/A	N/A	B	14.3	B	14.3	N/A	N/A	B	14.4	B	14.4									

As shown, the signalized intersection of Route 206 and CR 518 will experience capacity constraints with or without the proposed development. Signal timing adjustments are able to improve the overall intersection delay during each of the three (3) peak hours analyzed and ensure all turning movements comply with NJDOT degradation standards. NJDOT requires that the volume-to-capacity ratio not be increased for any movement that is operating at a Level of Service "F" during the No Build condition. This means that essentially any additional traffic at the intersection would require mitigation. However, in this case, a maximum of only a 2-second shift in signal timing is necessary to achieve the desired mitigation which is demonstrative of the minimal impact the Project will have on the adjacent signalized intersection. The site driveway on CR 518 will operate at Level of Service "B" or better during all peak hours analyzed.

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) right-turn ingress/right-turn egress driveway along CR 518 as well as one (1) right-turn ingress driveway along Route 206.

The newly constructed parking lot will provide one-way flow and operate in a counterclockwise direction with the ability to stack 16 cars in the dual drive-thru lanes without interrupting on-site circulation. Additionally, a bypass lane will be provided around the outside of the drive-thru lanes which will maintain traffic flow through the site. This access configuration and site circulation design is sufficient to accommodate the traffic volumes anticipated for The Project.

Parking

The Township Ordinance sets forth a parking requirement of 1 parking space per 3 seats. With 14 seats proposed, this equates to a parking requirement of 5 spaces whereas 17 spaces are provided. Therefore, the Ordinance requirement is satisfied. It is proposed to provide parking stalls with dimensions of 9'x18' which is in compliance with accepted engineering design standards. Although a loading zone is a requirement of the Ordinance, Dunkin' restaurants typically do not provide and

do not require a dedicated loading zone as deliveries are made in smaller vehicles that occupy standard parking spaces during off-peak hours.

Conclusion

Based upon our Traffic Impact Assessment as detailed in the body of this report, it is the professional opinion of Dynamic Traffic that the adjacent street system of Montgomery Township and NJDOT will not experience any significant degradation in operating conditions with the redevelopment of the site. The site driveways are located to provide safe 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.

If you have any questions on the above, please do not hesitate to contact me.

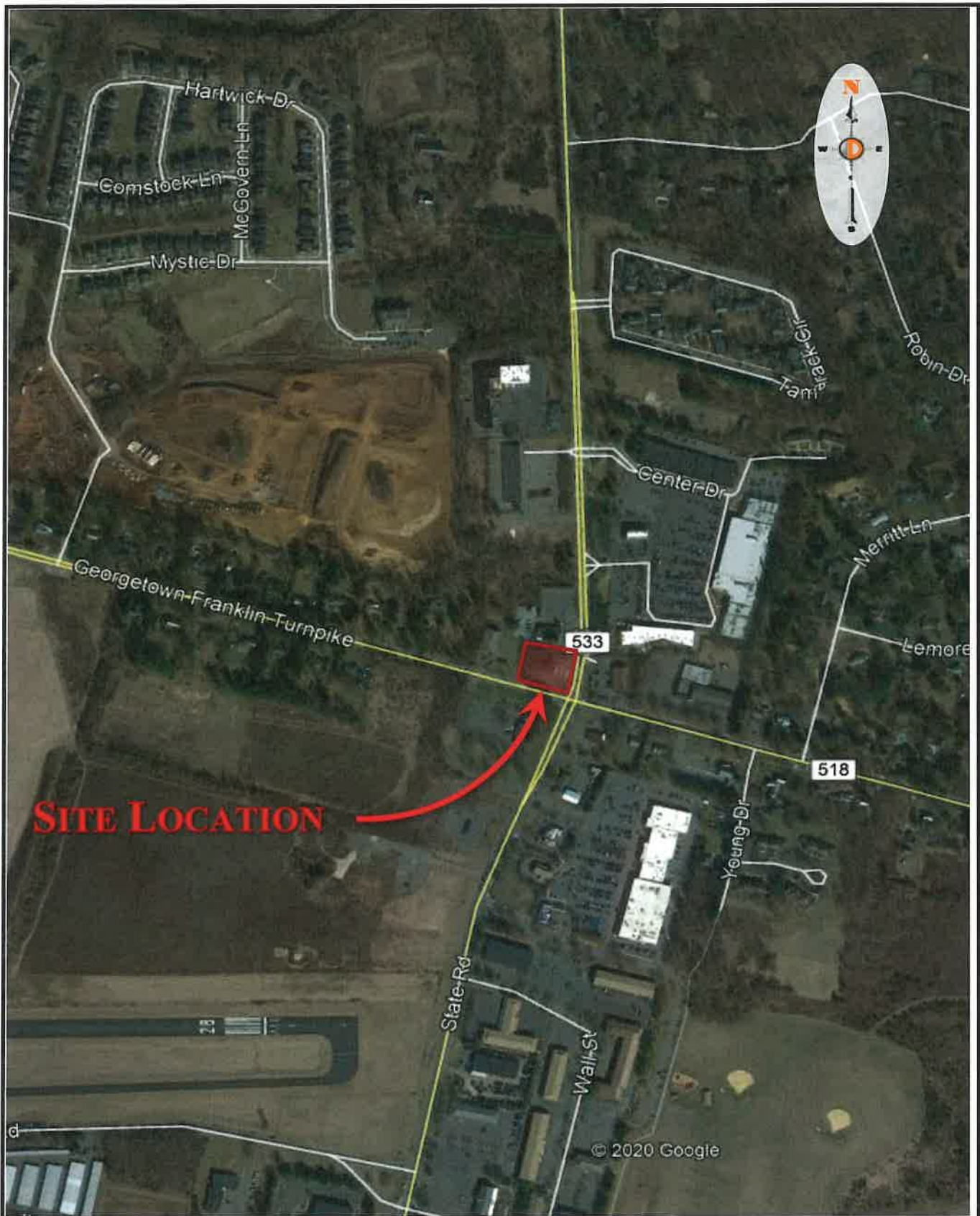
Sincerely,

Dynamic Traffic, LLC

A handwritten signature in black ink, appearing to read 'CW Peregoy', written over the printed name.

Craig W. Peregoy, PE
Principal
NJ PE License 45880

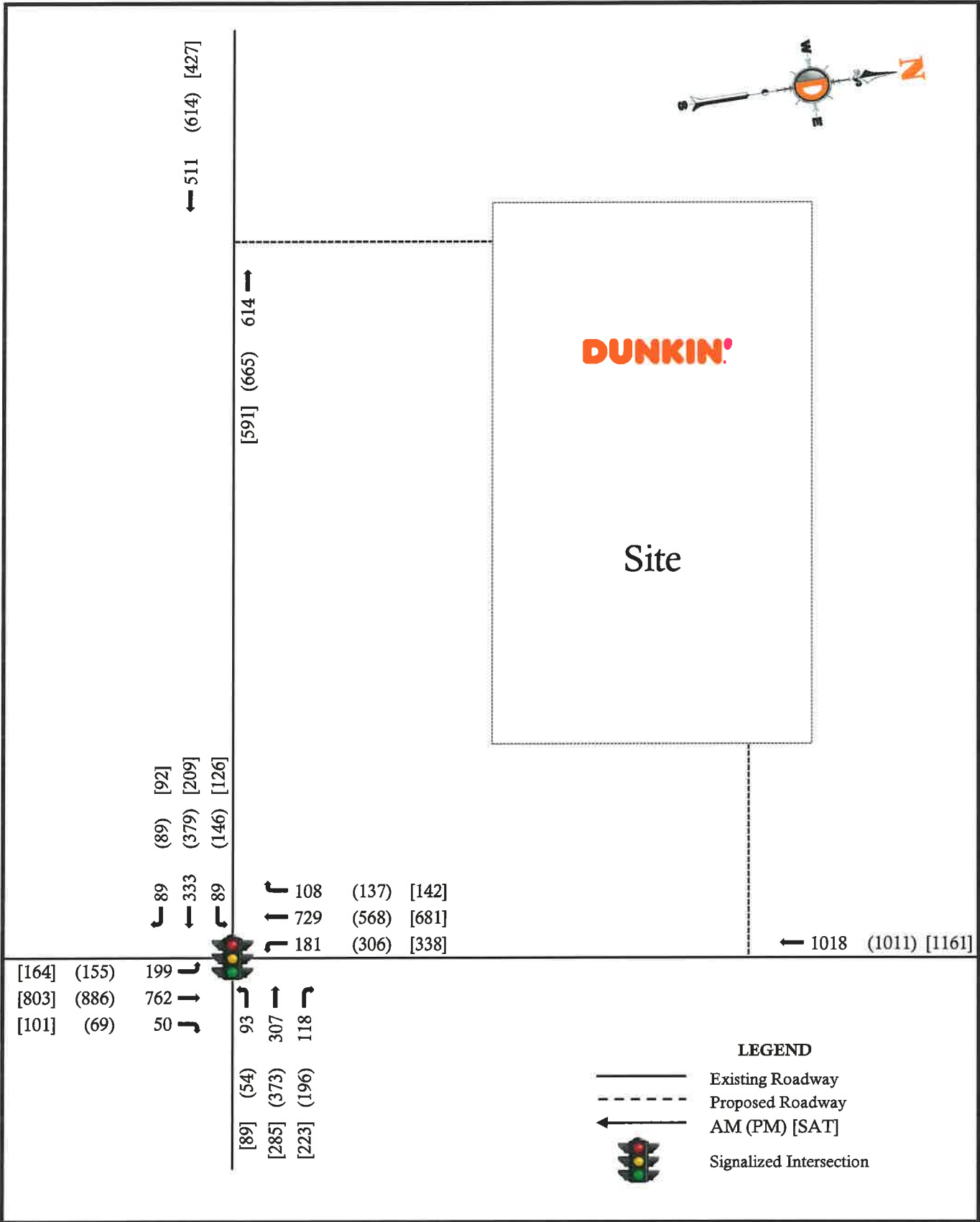
Appendix A
Traffic Volume Figures



Proposed Dunkin With Drive-Thru
 Traffic Impact Study
 3334-99-001TE
 10/21/2020

Figure 1

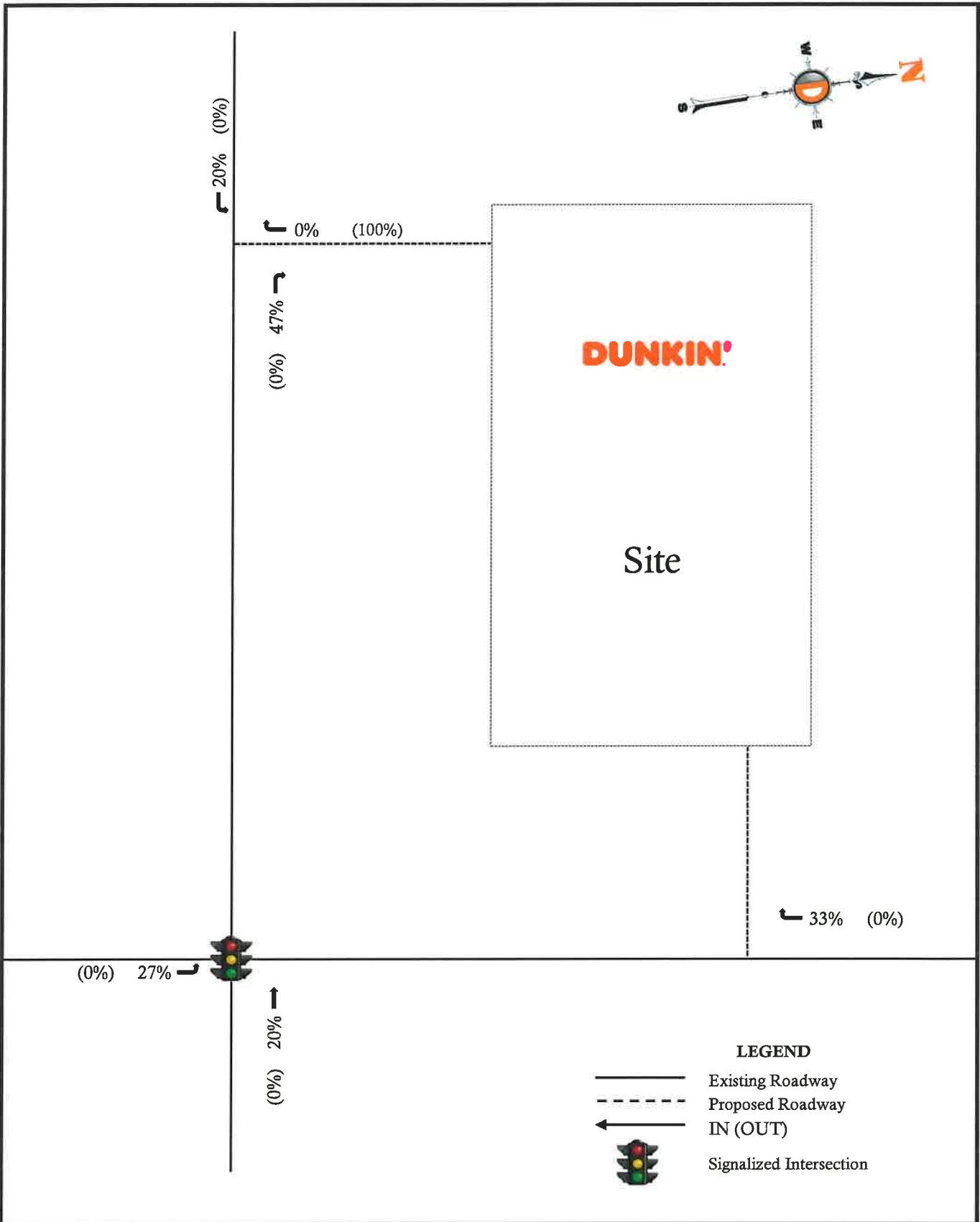
Site Location Map



Proposed Dunkin' With Drive-Thru
 Traffic Impact Study
 3334-99-001TE
 10/21/2020

Figure 2

No Build Traffic Volumes



Proposed Dunkin With Drive-Thru
 Traffic Impact Study
 3334-99-001TE
 10/21/2020

Figure 3
Percent Distribution
(Primary Trips)



└ 0% (100%)

↑ -40%
(0%) ↓ 40%
(0%)

DUNKIN'

Site

└ 60% (0%)



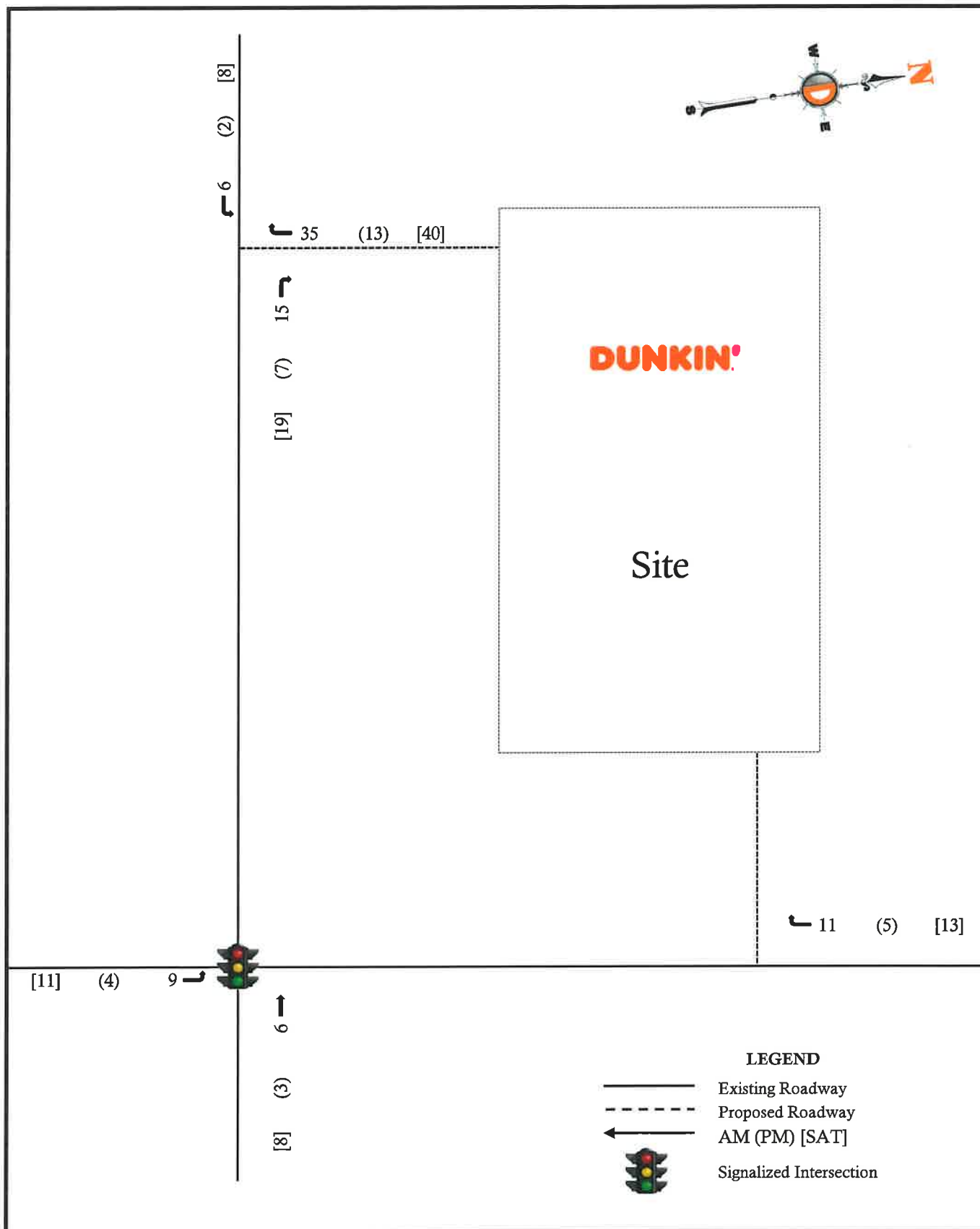
LEGEND

- Existing Roadway
- - - Proposed Roadway
- ← IN (OUT)
-  Signalized Intersection



Proposed Dunkin With Drive-Thru
Traffic Impact Study
3334-99-001TE
10/21/2020

Figure 4
Percent Distribution
(Passby Trips)



Proposed Dunkin With Drive-Thru
 Traffic Impact Study
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 10/21/2020

Figure 5

Primary Site Generated Trips



56 (26) [40]

↑ -22
[16] (-10) [16] (10)
↓ 22

DUNKIN'

Site

34 (16) [24]



LEGEND

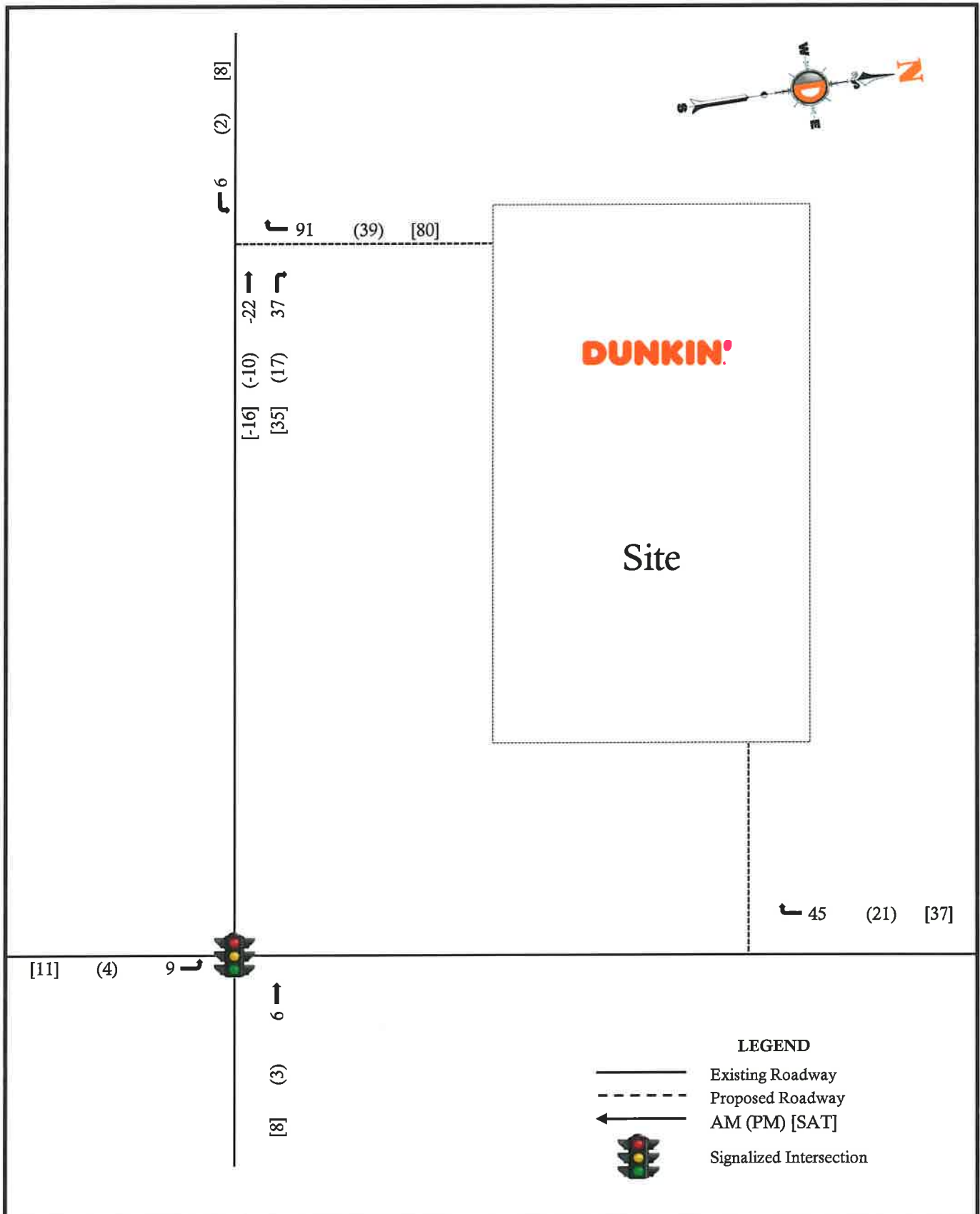
- Existing Roadway
- - - Proposed Roadway
- ← AM (PM) [SAT]
-  Signalized Intersection



Proposed Dunkin With Drive-Thru
Traffic Impact Study
3334-99-001TE
10/21/2020

Figure 6

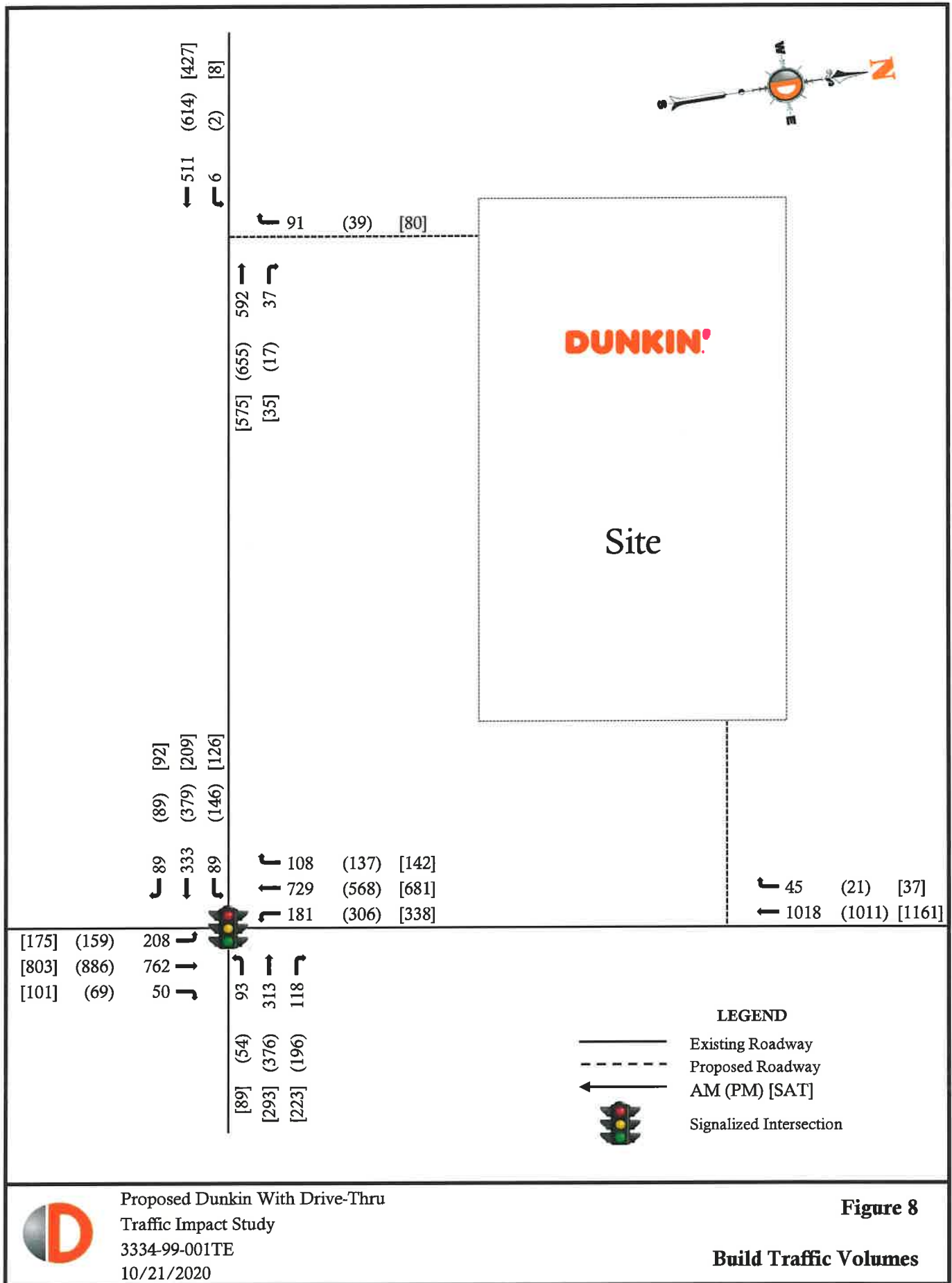
Passby Site Generated Trips



Proposed Dunkin With Drive-Thru
 Traffic Impact Study
 3334-99-001TE
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Figure 7

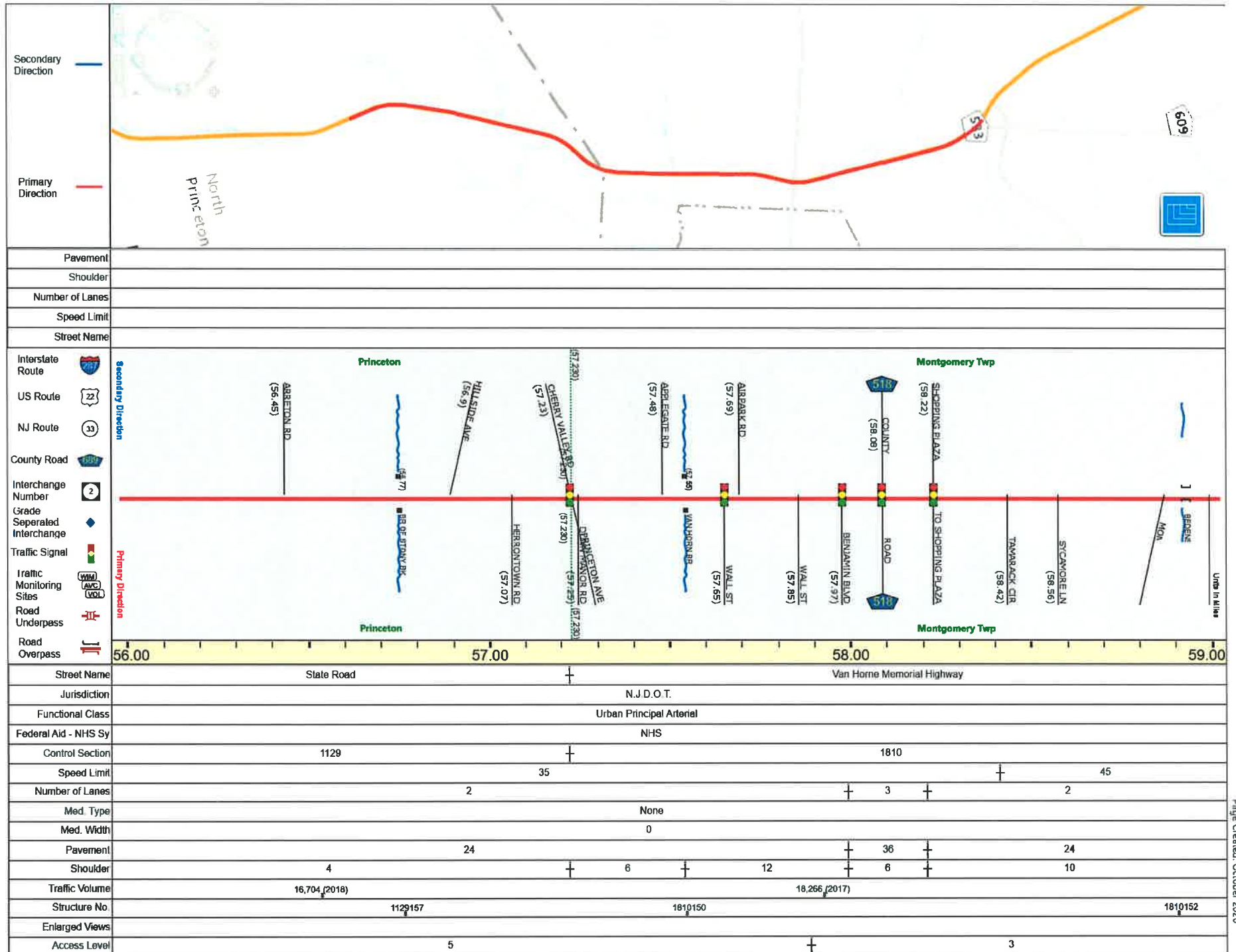
Total Site Generated Trips



Appendix B
Project Information

US 206 (South to North)

Mileposts: 56.000 - 59.000



SRI = 0000206_

Date Last Inventoried: June 2017

ROUTE 518 (West to East)

Mileposts: 14.000 - 17.000

Secondary Direction	Blue line
Primary Direction	Red line
Pavement	
Shoulder	
Number of Lanes	
Speed Limit	
Street Name	
Interstate Route	26
US Route	22
NJ Route	33
County Road	685
Interchange Number	2
Grade Separated Interchange	
Traffic Signal	
Traffic Monitoring Sites	WIM (AVC) VOL
Road Underpass	
Road Overpass	
Street Name	Georgetown-Franklin Turnpike
Jurisdiction	County
Functional Class	Urban Minor Arterial
Federal Aid - NHS Sy	STP
Control Section	
Speed Limit	45
Number of Lanes	2
Med. Type	None
Med. Width	0
Pavement	24
Shoulder	6
Traffic Volume	8,615 (2018)
Structure No.	18D020418D0206
Enlarged Views	
Access Level	

SRI = 00000518

Date Last Inventoried: October 2012

70, 95, 110 & 135 – SECOND BACKGROUND CYCLES

Phase	Signal Indications						Time (Seconds)			
	<u>1, 2</u>	<u>4, 5</u>	<u>3, 11</u>	<u>6, 12</u>	<u>7, 8</u>	<u>9, 10</u>	<u>Plan I</u> (135 Sec.)	<u>Plan II</u> (110 Sec.)	<u>Plan III</u> (70 Sec.)	<u>Plan IV</u> (95 Sec.)
A) Route US 206 ROW Change Clearance	G Y ⁽³⁾ R ⁽³⁾	G Y ⁽⁴⁾ R ⁽⁴⁾	G Y ⁽³⁾ R ⁽³⁾	G Y ⁽⁴⁾ R ⁽⁴⁾	R R R	R R R	93 – 62 5* 2	68 – 43 5* 2	30 – 20 5* 2	53 – 41 5* 2
B) Rocky Hill Road Lead Lefts Change	R R	R R	R R	R R	R/<G- R/<Y- ⁽⁵⁾	R/<G- R/<Y- ⁽⁶⁾	7 3	7 3	5 3	7 3
C) Rocky Hill Road ROW Change Clearance	R R R	R R R	R R R	R R R	G Y R	G Y R	7 – 34** 5 3	7 – 28** 5 3	7 – 17** 5 3	7 – 19** 5 3
D) Route US 206 Lead Lefts Change	R R	R R	R/<G- R/<Y- ⁽⁷⁾	R/<G- R/<Y- ⁽⁸⁾	R R	R R	7-11 3	7-11 3	7 3	7 3
Emergency Flash	Y	Y	Y	Y	R	R	-	-	-	-

NOTES:

- *Offsets are measured from the beginning of yellow to Route US 206 traffic at this intersection.
- **Actuation of a pedestrian push button shall guarantee 17 seconds of green time to Phase C.
- Phase C must follow Phase B.
- Phase D can only follow Phase C.
- The manual control cord is to be removed.
- The vehicle interval is to be 2 seconds.
- The memory circuit is to be off.
- The left turn slots of Phase B are to be operating independently but timed concurrently.
- The left turn slots of Phase D are to be operating independently but timed concurrently if actuation occurs in both slots. Each left turn slot is to be capable of terminating or extending separately or independently of each other, thereby reverting the timing to the non-conflicting through movement.

HOURS OF OPERATION

CYCLE LENGTH

***OFFSETS**

Plan I - Monday thru Friday / 6:30 A.M. – 9:30 A.M.
Plan II - Monday thru Friday / 3:30 P.M. – 6:30 P.M.
Plan III - Monday thru Sunday / 10:00 P.M. – 6:30 A.M.
Plan IV - All Other Times

135-Second Background Cycle
110-Second Background Cycle
70-Second Background Cycle
95-Second Background Cycle

0 Seconds
0 Seconds
0 Seconds
0 Seconds

EMERGENCY SEQUENCE ⁽¹⁾

<u>Phase</u>	<u>Signal Indications</u>						<u>Time (Seconds)</u>
	<u>1, 2</u>	<u>4, 5</u>	<u>3, 11</u>	<u>6, 12</u>	<u>7, 8</u>	<u>9, 10</u>	
E) Route US 206 N/B	G	R	G/<G-	R	R	R	(2)
Change	G	R	G/<Y-	R	R	R	3
Route US 206 ROW	G	G	G	G	R	R	10
<i>Resume Normal Operation</i>							
F) Route US 206 S/B	R	G	R	G/<G-	R	R	(2)
Change	R	G	R	G/<Y-	R	R	3
Route US 206 ROW	G	G	G	G	R	R	10
<i>Resume Normal Operation</i>							
G) Rocky Hill Road W/B	R	R	R	R	G/<G-	R	(2)
Change	R	R	R	R	Y	R	5
Clearance	R	R	R	R	R	R	2
Route US 206 ROW	G	G	G	G	R	R	10
<i>Resume Normal Operation</i>							
H) Rocky Hill Road E/B	R	R	R	R	R	G/<G-	(2)
Change	R	R	R	R	R	Y	5
Clearance	R	R	R	R	R	R	2
Route US 206 ROW	G	G	G	G	R	R	10
<i>Resume Normal Operation</i>							

EMERGENCY OPERATION NOTES:

- (1) Remote-control pre-emption is permitted from all approaches to the intersection. The controller shall guarantee all vehicular and pedestrian minimums, pedestrian clearances, and change and clearance times before leaving normal operation to sequence into the appropriate emergency sequence.
- (2) Green interval is to be held until emergency call terminates.
- (3) To remain green if Emergency Sequence E is next.
- (4) To remain green if Emergency Sequence F is next.
- (5) To remain R/<G- if Emergency Sequence G is next.
- (6) To remain R/<G- if Emergency Sequence H is next.
- (7) To remain R/<G- if Emergency Sequence E is next.
- (8) To remain R/<G- if Emergency Sequence F is next.

Appendix C

Capacity Analysis

3334-99-001TE
Proposed Dunkin

No Build AM Peak Hour
5: US Route 206 & Georgetown-Franklin Turnpike

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	333	89	93	307	118	199	762	50	181	729	108
Future Volume (vph)	89	333	89	93	307	118	199	762	50	181	729	108
Ideal Flow (vphpl)	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950
Lane Width (ft)	11	11	11	11	12	12	11	12	12	12	15	13
Storage Length (ft)	150		0	150		0	150		0	200		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	100			25			25			200		
Right Turn on Red			No			Yes			No			No
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		744			946			886			778	
Travel Time (s)		14.5			18.4			15.1			13.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	97	459	0	101	462	0	216	882	0	197	909	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	62.0		7.0	62.0	
Minimum Split (s)	10.0	15.0		10.0	15.0		10.0	69.0		10.0	69.0	
Total Split (s)	10.0	42.0		10.0	42.0		14.0	69.0		14.0	69.0	
Total Split (%)	7.4%	31.1%		7.4%	31.1%		10.4%	51.1%		10.4%	51.1%	
Yellow Time (s)	3.0	5.0		3.0	5.0		3.0	5.0		3.0	5.0	
All-Red Time (s)	0.0	3.0		0.0	3.0		0.0	2.0		0.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	3.0	8.0		3.0	8.0		3.0	7.0		3.0	7.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Act Effct Green (s)	46.0	34.0		46.0	34.0		77.9	62.9		76.1	62.0	
Actuated g/C Ratio	0.34	0.25		0.34	0.25		0.58	0.47		0.56	0.46	
v/c Ratio	0.63	1.02		0.66	0.98		1.07	0.53		0.56	0.96	
Control Delay	48.6	97.1		50.8	85.5		118.5	27.1		19.1	56.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	48.6	97.1		50.8	85.5		118.5	27.1		19.1	56.7	
LOS	D	F		D	F		F	C		B	E	
Approach Delay		88.6			79.3			45.1			50.0	
Approach LOS		F			E			D			D	
Queue Length 50th (ft)	57	~425		60	395		~157	286		75	757	
Queue Length 95th (ft)	#109	#640		#105	#622		#325	348		114	#1047	
Internal Link Dist (ft)		664			866			806			698	
Turn Bay Length (ft)	150			150			150			200		
Base Capacity (vph)	154	450		154	471		201	1677		365	947	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.63	1.02		0.66	0.98		1.07	0.53		0.54	0.96	

Intersection Summary

Area Type: Other

Cycle Length: 135

Actuated Cycle Length: 135

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow, Master Intersection

Natural Cycle: 125

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.07

Intersection Signal Delay: 59.8

Intersection LOS: E

Intersection Capacity Utilization 110.2%

ICU Level of Service H

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 5: US Route 206 & Georgetown-Franklin Turnpike

 Ø1	 Ø2 (R)	 Ø3	 Ø4
14 s	69 s	10 s	42 s
 Ø5	 Ø6 (R)	 Ø7	 Ø8
14 s	69 s	10 s	42 s

3334-99-001TE
Proposed Dunkin

No Build PM Peak Hour
5: US Route 206 & Georgetown-Franklin Turnpike

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	146	379	89	54	373	196	155	886	69	306	568	137
Future Volume (vph)	146	379	89	54	373	196	155	886	69	306	568	137
Ideal Flow (vphpl)	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950
Lane Width (ft)	11	11	11	11	12	12	11	12	12	12	15	13
Storage Length (ft)	150		0	150		0	150		0	200		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	100			25			25			200		
Right Turn on Red			No			Yes			No			No
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		744			946			886			778	
Travel Time (s)		14.5			18.4			15.1			13.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	159	509	0	59	618	0	168	1038	0	333	766	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	43.0		7.0	43.0	
Minimum Split (s)	10.0	15.0		10.0	15.0		10.0	50.0		10.0	50.0	
Total Split (s)	10.0	36.0		10.0	36.0		14.0	50.0		14.0	50.0	
Total Split (%)	9.1%	32.7%		9.1%	32.7%		12.7%	45.5%		12.7%	45.5%	
Yellow Time (s)	3.0	5.0		3.0	5.0		3.0	5.0		3.0	5.0	
All-Red Time (s)	0.0	3.0		0.0	3.0		0.0	2.0		0.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	3.0	8.0		3.0	8.0		3.0	7.0		3.0	7.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Act Effct Green (s)	40.6	30.0		40.0	28.0		56.6	43.0		59.2	44.4	
Actuated g/C Ratio	0.37	0.27		0.36	0.25		0.51	0.39		0.54	0.40	
v/c Ratio	0.85	1.04		0.31	1.29		0.74	0.74		1.16	0.93	
Control Delay	63.2	92.5		25.7	180.6		39.0	32.6		127.9	50.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	63.2	92.5		25.7	180.6		39.0	32.6		127.9	50.9	
LOS	E	F		C	F		D	C		F	D	
Approach Delay		85.5			167.1			33.5			74.2	
Approach LOS		F			F			C			E	
Queue Length 50th (ft)	74	~413		26	~549		58	325		~202	515	
Queue Length 95th (ft)	#177	#620		54	#772		#144	405		#387	#772	
Internal Link Dist (ft)		664			866			806			698	
Turn Bay Length (ft)	150			150			150			200		
Base Capacity (vph)	186	489		189	478		249	1404		287	824	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.85	1.04		0.31	1.29		0.67	0.74		1.16	0.93	

Intersection Summary

Area Type: Other
 Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green, Master Intersection
 Natural Cycle: 135
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.29
 Intersection Signal Delay: 80.1
 Intersection LOS: F
 Intersection Capacity Utilization 110.2%
 ICU Level of Service H
 Analysis Period (min) 15

- ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 5: US Route 206 & Georgetown-Franklin Turnpike



3334-99-001TE
Proposed Dunkin

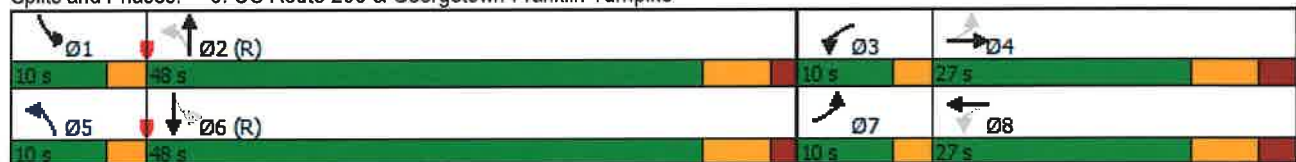
Build SAT Peak Hour
5: US Route 206 & Georgetown-Franklin Turnpike

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	126	209	92	89	285	223	164	803	101	338	681	142
Future Volume (vph)	126	209	92	89	285	223	164	803	101	338	681	142
Ideal Flow (vphpl)	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950
Lane Width (ft)	11	11	11	11	12	12	11	12	12	12	15	13
Storage Length (ft)	150		0	150		0	150		0	200		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	100			25			25			200		
Right Turn on Red			No			Yes			No			No
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		744			946			886			778	
Travel Time (s)		14.5			18.4			15.1			13.3	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Shared Lane Traffic (%)												
Lane Group Flow (vph)	138	331	0	98	558	0	180	993	0	371	904	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	41.0		7.0	41.0	
Minimum Split (s)	10.0	15.0		10.0	15.0		10.0	48.0		10.0	48.0	
Total Split (s)	10.0	27.0		10.0	27.0		10.0	48.0		10.0	48.0	
Total Split (%)	10.5%	28.4%		10.5%	28.4%		10.5%	50.5%		10.5%	50.5%	
Yellow Time (s)	3.0	5.0		3.0	5.0		3.0	5.0		3.0	5.0	
All-Red Time (s)	0.0	3.0		0.0	3.0		0.0	2.0		0.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	3.0	8.0		3.0	8.0		3.0	7.0		3.0	7.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Act Effct Green (s)	31.6	21.0		31.0	19.0		52.0	41.0		52.0	41.0	
Actuated g/C Ratio	0.33	0.22		0.33	0.20		0.55	0.43		0.55	0.43	
v/c Ratio	0.63	0.85		0.33	1.45		0.83	0.64		1.26	1.02	
Control Delay	35.8	58.5		24.2	243.9		47.8	23.7		159.1	64.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	35.8	58.5		24.2	243.9		47.8	23.7		159.1	64.7	
LOS	D	E		C	F		D	C		F	E	
Approach Delay		51.8			211.1			27.4			92.2	
Approach LOS		D			F			C			F	
Queue Length 50th (ft)	57	198		40	~446		50	241		~163	~584	
Queue Length 95th (ft)	#111	#364		76	#652		#167	309		#333	#816	
Internal Link Dist (ft)		664			866			806			698	
Turn Bay Length (ft)	150			150			150			200		
Base Capacity (vph)	220	389		294	386		216	1541		295	883	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.63	0.85		0.33	1.45		0.83	0.64		1.26	1.02	

Intersection Summary

Area Type: Other
 Cycle Length: 95
 Actuated Cycle Length: 95
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green, Master Intersection
 Natural Cycle: 135
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.45
 Intersection Signal Delay: 87.4 Intersection LOS: F
 Intersection Capacity Utilization 106.3% ICU Level of Service G
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 5: US Route 206 & Georgetown-Franklin Turnpike



3334-99-001TE
Proposed Dunkin

Build AM Peak Hour
5: US Route 206 & Georgetown-Franklin Turnpike

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	333	89	93	313	118	208	762	50	181	729	108
Future Volume (vph)	89	333	89	93	313	118	208	762	50	181	729	108
Ideal Flow (vphpl)	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950
Lane Width (ft)	11	11	11	11	12	12	11	12	12	12	15	13
Storage Length (ft)	150		0	150		0	150		0	200		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	100			25			25			200		
Right Turn on Red			No			Yes			No			No
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		744			946			886			778	
Travel Time (s)		14.5			18.4			15.1			13.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	97	459	0	101	468	0	226	882	0	197	909	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	62.0		7.0	62.0	
Minimum Split (s)	10.0	15.0		10.0	15.0		10.0	69.0		10.0	69.0	
Total Split (s)	10.0	42.0		10.0	42.0		14.0	69.0		14.0	69.0	
Total Split (%)	7.4%	31.1%		7.4%	31.1%		10.4%	51.1%		10.4%	51.1%	
Yellow Time (s)	3.0	5.0		3.0	5.0		3.0	5.0		3.0	5.0	
All-Red Time (s)	0.0	3.0		0.0	3.0		0.0	2.0		0.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	3.0	8.0		3.0	8.0		3.0	7.0		3.0	7.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Act Effect Green (s)	46.0	34.0		46.0	34.0		77.9	62.9		76.1	62.0	
Actuated g/C Ratio	0.34	0.25		0.34	0.25		0.58	0.47		0.56	0.46	
v/c Ratio	0.63	1.02		0.66	0.99		1.12	0.53		0.56	0.96	
Control Delay	48.6	97.1		50.8	88.7		134.2	27.1		19.1	56.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	48.6	97.1		50.8	88.7		134.2	27.1		19.1	56.7	
LOS	D	F		D	F		F	C		B	E	
Approach Delay		88.6			82.0			48.9			50.0	
Approach LOS		F			F			D			D	
Queue Length 50th (ft)	57	~425		60	402		~175	286		75	757	
Queue Length 95th (ft)	#109	#640		#105	#634		#347	348		114	#1047	
Internal Link Dist (ft)		664			866			806			698	
Turn Bay Length (ft)	150			150			150			200		
Base Capacity (vph)	154	450		154	471		201	1677		365	947	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.63	1.02		0.66	0.99		1.12	0.53		0.54	0.96	

Intersection Summary

Area Type: Other

Cycle Length: 135

Actuated Cycle Length: 135

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green, Master Intersection

Natural Cycle: 135

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.12

Intersection Signal Delay: 61.5

Intersection LOS: E

Intersection Capacity Utilization 110.9%

ICU Level of Service H

Analysis Period (min) 15

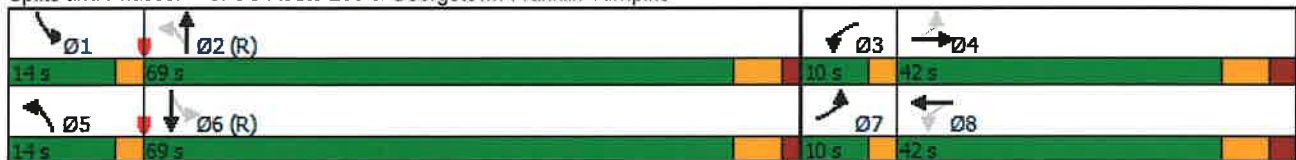
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 5: US Route 206 & Georgetown-Franklin Turnpike



3334-99-001TE
Proposed Dunkin

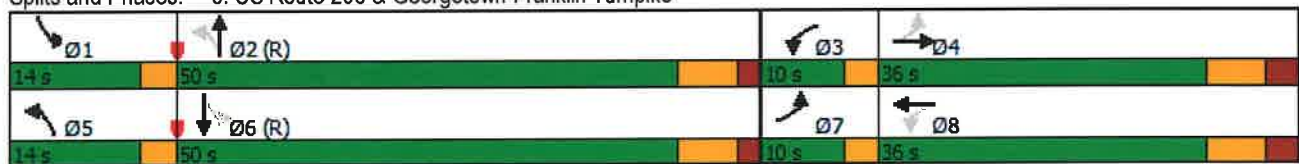
Build PM Peak Hour
5: US Route 206 & Georgetown-Franklin Turnpike

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	146	379	89	54	376	196	159	886	69	306	568	137
Future Volume (vph)	146	379	89	54	376	196	159	886	69	306	568	137
Ideal Flow (vphpl)	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950
Lane Width (ft)	11	11	11	11	12	12	11	12	12	12	15	13
Storage Length (ft)	150		0	150		0	150		0	200		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	100			25			25			200		
Right Turn on Red			No			Yes			No			No
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		744			946			886			778	
Travel Time (s)		14.5			18.4			15.1			13.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	159	509	0	59	622	0	173	1038	0	333	766	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	43.0		7.0	43.0	
Minimum Split (s)	10.0	15.0		10.0	15.0		10.0	50.0		10.0	50.0	
Total Split (s)	10.0	36.0		10.0	36.0		14.0	50.0		14.0	50.0	
Total Split (%)	9.1%	32.7%		9.1%	32.7%		12.7%	45.5%		12.7%	45.5%	
Yellow Time (s)	3.0	5.0		3.0	5.0		3.0	5.0		3.0	5.0	
All-Red Time (s)	0.0	3.0		0.0	3.0		0.0	2.0		0.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	3.0	8.0		3.0	8.0		3.0	7.0		3.0	7.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Act Effct Green (s)	40.6	30.0		40.0	28.0		56.7	43.0		59.1	44.3	
Actuated g/C Ratio	0.37	0.27		0.36	0.25		0.52	0.39		0.54	0.40	
v/c Ratio	0.85	1.04		0.31	1.30		0.76	0.74		1.16	0.93	
Control Delay	63.2	92.5		25.7	184.0		40.7	32.6		128.0	51.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	63.2	92.5		25.7	184.0		40.7	32.6		128.0	51.4	
LOS	E	F		C	F		D	C		F	D	
Approach Delay		85.5			170.3			33.8			74.6	
Approach LOS		F			F			C			E	
Queue Length 50th (ft)	74	~413		26	~554		61	325		~203	518	
Queue Length 95th (ft)	#177	#620		54	#778		#153	405		#387	#772	
Internal Link Dist (ft)		664			866			806			698	
Turn Bay Length (ft)	150			150			150			200		
Base Capacity (vph)	186	489		189	478		249	1404		287	822	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.85	1.04		0.31	1.30		0.69	0.74		1.16	0.93	

Intersection Summary

Area Type: Other
 Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green, Master Intersection
 Natural Cycle: 135
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.30
 Intersection Signal Delay: 80.9 Intersection LOS: F
 Intersection Capacity Utilization 110.3% ICU Level of Service H
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 5: US Route 206 & Georgetown-Franklin Turnpike



3334-99-001TE
Proposed Dunkin

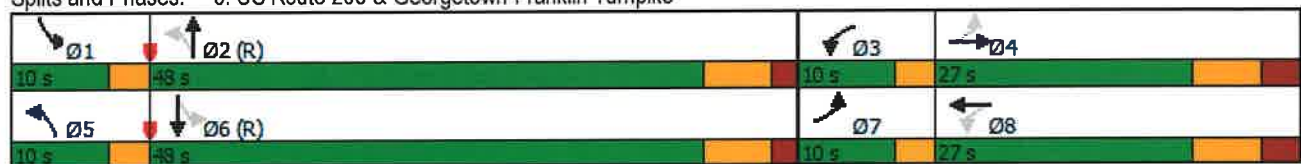
Build SAT Peak Hour
5: US Route 206 & Georgetown-Franklin Turnpike

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	126	209	92	89	293	223	175	803	101	338	681	142
Future Volume (vph)	126	209	92	89	293	223	175	803	101	338	681	142
Ideal Flow (vphpl)	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950
Lane Width (ft)	11	11	11	11	12	12	11	12	12	12	15	13
Storage Length (ft)	150		0	150		0	150		0	200		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	100			25			25			200		
Right Turn on Red			No			Yes			No			No
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		744			946			886			778	
Travel Time (s)		14.5			18.4			15.1			13.3	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Shared Lane Traffic (%)												
Lane Group Flow (vph)	138	331	0	98	567	0	192	993	0	371	904	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	41.0		7.0	41.0	
Minimum Split (s)	10.0	15.0		10.0	15.0		10.0	48.0		10.0	48.0	
Total Split (s)	10.0	27.0		10.0	27.0		10.0	48.0		10.0	48.0	
Total Split (%)	10.5%	28.4%		10.5%	28.4%		10.5%	50.5%		10.5%	50.5%	
Yellow Time (s)	3.0	5.0		3.0	5.0		3.0	5.0		3.0	5.0	
All-Red Time (s)	0.0	3.0		0.0	3.0		0.0	2.0		0.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	3.0	8.0		3.0	8.0		3.0	7.0		3.0	7.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Act Effect Green (s)	31.6	21.0		31.0	19.0		52.0	41.0		52.0	41.0	
Actuated g/C Ratio	0.33	0.22		0.33	0.20		0.55	0.43		0.55	0.43	
v/c Ratio	0.63	0.85		0.33	1.47		0.89	0.64		1.26	1.02	
Control Delay	35.8	58.5		24.2	253.7		57.4	23.7		159.1	64.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	35.8	58.5		24.2	253.7		57.4	23.7		159.1	64.7	
LOS	D	E		C	F		E	C		F	E	
Approach Delay		51.8			219.9			29.1			92.2	
Approach LOS		D			F			C			F	
Queue Length 50th (ft)	57	198		40	~459		59	241		~163	~584	
Queue Length 95th (ft)	#111	#364		76	#666		#187	309		#333	#816	
Internal Link Dist (ft)		664			866			806			698	
Turn Bay Length (ft)	150			150			150			200		
Base Capacity (vph)	220	389		294	386		216	1541		295	883	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.63	0.85		0.33	1.47		0.89	0.64		1.26	1.02	

Intersection Summary

Area Type: Other
 Cycle Length: 95
 Actuated Cycle Length: 95
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green, Master Intersection
 Natural Cycle: 135
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.47
 Intersection Signal Delay: 89.8 Intersection LOS: F
 Intersection Capacity Utilization 107.0% ICU Level of Service G
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 5: US Route 206 & Georgetown-Franklin Turnpike



3334-99-001TE
Proposed Dunkin

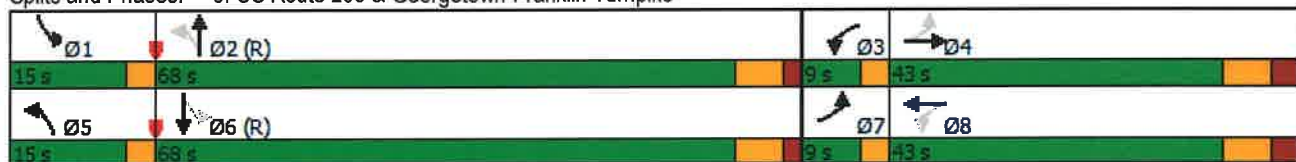
Build AM Peak Hour with Mitigation
5: US Route 206 & Georgetown-Franklin Turnpike

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	333	89	93	313	118	208	762	50	181	729	108
Future Volume (vph)	89	333	89	93	313	118	208	762	50	181	729	108
Ideal Flow (vphpl)	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950
Lane Width (ft)	11	11	11	11	12	12	11	12	12	12	15	13
Storage Length (ft)	150		0	150		0	150		0	200		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	100			25			25			200		
Right Turn on Red			No			Yes			No			No
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		744			946			886			778	
Travel Time (s)		14.5			18.4			15.1			13.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	97	459	0	101	468	0	226	882	0	197	909	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	6.0	7.0		6.0	7.0		7.0	61.0		7.0	61.0	
Minimum Split (s)	9.0	15.0		9.0	15.0		10.0	68.0		10.0	68.0	
Total Split (s)	9.0	43.0		9.0	43.0		15.0	68.0		15.0	68.0	
Total Split (%)	6.7%	31.9%		6.7%	31.9%		11.1%	50.4%		11.1%	50.4%	
Yellow Time (s)	3.0	5.0		3.0	5.0		3.0	5.0		3.0	5.0	
All-Red Time (s)	0.0	3.0		0.0	3.0		0.0	2.0		0.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	3.0	8.0		3.0	8.0		3.0	7.0		3.0	7.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Act Effct Green (s)	46.0	35.0		46.0	35.0		78.2	62.5		75.5	61.0	
Actuated g/C Ratio	0.34	0.26		0.34	0.26		0.58	0.46		0.56	0.45	
v/c Ratio	0.69	0.99		0.69	0.96		1.06	0.53		0.55	0.98	
Control Delay	56.3	89.4		55.6	80.9		113.1	27.5		18.9	60.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	56.3	89.4		55.6	80.9		113.1	27.5		18.9	60.6	
LOS	E	F		E	F		F	C		B	E	
Approach Delay		83.7			76.4			45.0			53.2	
Approach LOS		F			E			D			D	
Queue Length 50th (ft)	57	403		60	397		~163	286		75	768	
Queue Length 95th (ft)	#110	#628		#107	#620		#337	354		114	#1061	
Internal Link Dist (ft)		664			866			806			698	
Turn Bay Length (ft)	150			150			150			200		
Base Capacity (vph)	140	463		146	485		213	1666		376	932	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.69	0.99		0.69	0.96		1.06	0.53		0.52	0.98	

Intersection Summary

Area Type: Other
 Cycle Length: 135
 Actuated Cycle Length: 135
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green, Master Intersection
 Natural Cycle: 125
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.06
 Intersection Signal Delay: 59.5
 Intersection LOS: E
 Intersection Capacity Utilization 109.3%
 ICU Level of Service H
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 5: US Route 206 & Georgetown-Franklin Turnpike



3334-99-001TE
Proposed Dunkin

Build PM Peak Hour with Mitigation

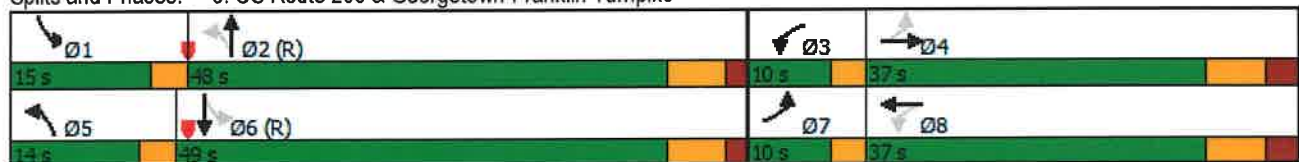
5: US Route 206 & Georgetown-Franklin Turnpike

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	146	379	89	54	376	196	159	886	69	306	568	137
Future Volume (vph)	146	379	89	54	376	196	159	886	69	306	568	137
Ideal Flow (vphpl)	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950
Lane Width (ft)	11	11	11	11	12	12	11	12	12	12	15	13
Storage Length (ft)	150		0	150		0	150		0	200		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	100			25			25			200		
Right Turn on Red			No			Yes			No			No
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		744			946			886			778	
Travel Time (s)		14.5			18.4			15.1			13.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	159	509	0	59	622	0	173	1038	0	333	766	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	41.0		7.0	42.0	
Minimum Split (s)	10.0	15.0		10.0	15.0		10.0	48.0		10.0	49.0	
Total Split (s)	10.0	37.0		10.0	37.0		14.0	48.0		15.0	49.0	
Total Split (%)	9.1%	33.6%		9.1%	33.6%		12.7%	43.6%		13.6%	44.5%	
Yellow Time (s)	3.0	5.0		3.0	5.0		3.0	5.0		3.0	5.0	
All-Red Time (s)	0.0	3.0		0.0	3.0		0.0	2.0		0.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	3.0	8.0		3.0	8.0		3.0	7.0		3.0	7.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Act Effct Green (s)	41.6	31.0		41.0	29.0		54.8	41.0		58.8	43.2	
Actuated g/C Ratio	0.38	0.28		0.37	0.26		0.50	0.37		0.53	0.39	
v/c Ratio	0.85	1.01		0.31	1.26		0.75	0.78		1.16	0.96	
Control Delay	62.7	83.1		25.2	165.4		40.2	35.3		128.1	56.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	62.7	83.1		25.2	165.4		40.2	35.3		128.1	56.2	
LOS	E	F		C	F		D	D		F	E	
Approach Delay		78.2			153.3			36.0			78.0	
Approach LOS		E			F			D			E	
Queue Length 50th (ft)	73	~401		25	~542		61	336		~212	526	
Queue Length 95th (ft)	#177	#608		53	#766		#152	418		#396	#785	
Internal Link Dist (ft)		664			866			806			698	
Turn Bay Length (ft)	150			150			150			200		
Base Capacity (vph)	186	505		188	495		250	1338		288	802	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.85	1.01		0.31	1.26		0.69	0.78		1.16	0.96	

Intersection Summary

Area Type: Other
 Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green, Master Intersection
 Natural Cycle: 125
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.26
 Intersection Signal Delay: 78.1 Intersection LOS: E
 Intersection Capacity Utilization 108.7% ICU Level of Service G
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 5: US Route 206 & Georgetown-Franklin Turnpike



3334-99-001TE
Proposed Dunkin

Build SAT Peak Hour with Mitigation
5: US Route 206 & Georgetown-Franklin Turnpike

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	126	209	92	89	293	223	175	803	101	338	681	142
Future Volume (vph)	126	209	92	89	293	223	175	803	101	338	681	142
Ideal Flow (vphpl)	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950
Lane Width (ft)	11	11	11	11	12	12	11	12	12	12	15	13
Storage Length (ft)	150		0	150		0	150		0	200		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	100			25			25			200		
Right Turn on Red			No			Yes			No			No
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		744			946			886			778	
Travel Time (s)		14.5			18.4			15.1			13.3	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Shared Lane Traffic (%)												
Lane Group Flow (vph)	138	331	0	98	567	0	192	993	0	371	904	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	6.0	7.0		6.0	7.0		7.0	40.0		7.0	40.5	
Minimum Split (s)	9.0	15.0		9.0	15.0		10.0	47.0		10.0	47.5	
Total Split (s)	9.0	28.0		9.0	28.0		10.5	47.0		11.0	47.5	
Total Split (%)	9.5%	29.5%		9.5%	29.5%		11.1%	49.5%		11.6%	50.0%	
Yellow Time (s)	3.0	5.0		3.0	5.0		3.0	5.0		3.0	5.0	
All-Red Time (s)	0.0	3.0		0.0	3.0		0.0	2.0		0.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	3.0	8.0		3.0	8.0		3.0	7.0		3.0	7.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Act Effct Green (s)	31.6	21.8		31.0	20.0		51.5	40.0		52.5	40.5	
Actuated g/C Ratio	0.33	0.23		0.33	0.21		0.54	0.42		0.55	0.43	
v/c Ratio	0.69	0.82		0.34	1.40		0.85	0.66		1.21	1.04	
Control Delay	41.6	53.9		24.6	224.1		50.5	24.7		139.8	68.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	41.6	53.9		24.6	224.1		50.5	24.7		139.8	68.5	
LOS	D	D		C	F		D	C		F	E	
Approach Delay		50.3			194.7			28.9			89.2	
Approach LOS		D			F			C			F	
Queue Length 50th (ft)	57	195		40	~446		58	246		~156	~591	
Queue Length 95th (ft)	#108	#352		76	#653		#180	316		#326	#823	
Internal Link Dist (ft)		664			866			806			698	
Turn Bay Length (ft)	150			150			150			200		
Base Capacity (vph)	201	404		286	405		225	1503		306	873	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.69	0.82		0.34	1.40		0.85	0.66		1.21	1.04	

Intersection Summary

Area Type: Other

Cycle Length: 95

Actuated Cycle Length: 95

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green, Master Intersection

Natural Cycle: 135

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.40

Intersection Signal Delay: 83.7

Intersection LOS: F

Intersection Capacity Utilization 107.0%

ICU Level of Service G

Analysis Period (min) 15

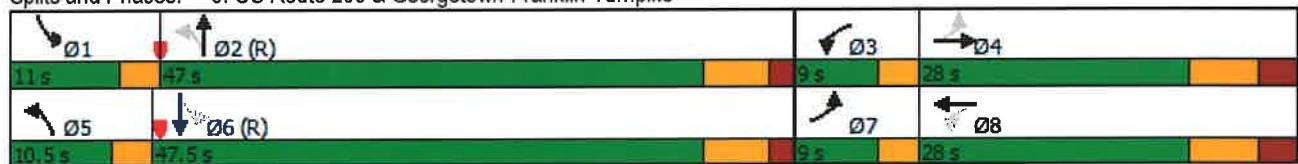
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 5: US Route 206 & Georgetown-Franklin Turnpike



HCS7 Two-Way Stop-Control Report

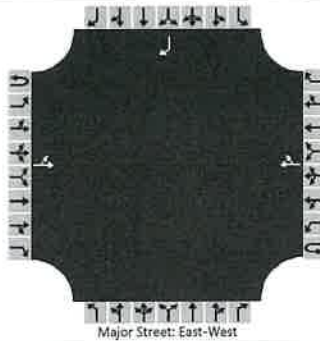
General Information

Analyst	CWP
Agency/Co.	Dynamic Traffic, LLC
Date Performed	10/15/2020
Analysis Year	
Time Analyzed	Build AM Peak Hour
Intersection Orientation	East-West
Project Description	Dunkin - Montgomery

Site Information

Intersection	Site Driveway & CR 518
Jurisdiction	Somerset County
East/West Street	CR. 518
North/South Street	Site Driveway
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	0	1
Configuration		LT						TR								R
Volume (veh/h)		6	511				592	37								91
Percent Heavy Vehicles (%)		0														0
Proportion Time Blocked																
Percent Grade (%)																0
Right Turn Channelized																No
Median Type Storage																

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1														6.2
Critical Headway (sec)		4.10														6.20
Base Follow-Up Headway (sec)		2.2														3.3
Follow-Up Headway (sec)		2.20														3.30

Delay, Queue Length, and Level of Service

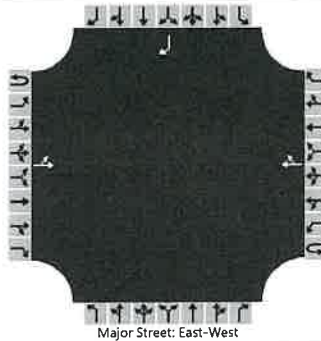
Flow Rate, v (veh/h)		7														99
Capacity, c (veh/h)		919														464
v/c Ratio		0.01														0.21
95% Queue Length, Q ₉₅ (veh)		0.0														0.8
Control Delay (s/veh)		8.9														14.8
Level of Service (LOS)		A														B
Approach Delay (s/veh)		0.2														14.8
Approach LOS																B

HCS7 Two-Way Stop-Control Report

General Information

Analyst	CWP	Intersection	Site Driveway & CR 518
Agency/Co.	Dynamic Traffic, LLC	Jurisdiction	Somerset County
Date Performed	10/15/2020	East/West Street	CR. 518
Analysis Year		North/South Street	Site Driveway
Time Analyzed	Build PM Peak Hour	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Dunkin - Montgomery		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	0	1
Configuration		LT						TR								R
Volume (veh/h)		2	614				655	17								39
Percent Heavy Vehicles (%)		0														0
Proportion Time Blocked																
Percent Grade (%)																0
Right Turn Channelized																No
Median Type Storage																

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1														6.2
Critical Headway (sec)		4.10														6.20
Base Follow-Up Headway (sec)		2.2														3.3
Follow-Up Headway (sec)		2.20														3.30

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		2														42
Capacity, c (veh/h)		883														431
v/c Ratio		0.00														0.10
95% Queue Length, Q ₉₅ (veh)		0.0														0.3
Control Delay (s/veh)		9.1														14.3
Level of Service (LOS)		A														B
Approach Delay (s/veh)		0.1														14.3
Approach LOS																B

HCS7 Two-Way Stop-Control Report

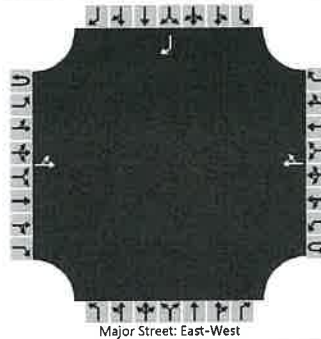
General Information

Analyst	CWP
Agency/Co.	Dynamic Traffic, LLC
Date Performed	10/15/2020
Analysis Year	
Time Analyzed	Build SAT Peak Hour
Intersection Orientation	East-West
Project Description	Dunkin - Montgomery

Site Information

Intersection	Site Driveway & CR 518
Jurisdiction	Somerset County
East/West Street	CR. 518
North/South Street	Site Driveway
Peak Hour Factor	0.91
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	0	1
Configuration		LT						TR								R
Volume (veh/h)		8	427				575	35								80
Percent Heavy Vehicles (%)		0														0
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized													No			
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1														6.2
Critical Headway (sec)		4.10														6.20
Base Follow-Up Headway (sec)		2.2														3.3
Follow-Up Headway (sec)		2.20														3.30

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		9														88
Capacity, c (veh/h)		929														472
v/c Ratio		0.01														0.19
95% Queue Length, Q ₉₅ (veh)		0.0														0.7
Control Delay (s/veh)		8.9														14.4
Level of Service (LOS)		A														B
Approach Delay (s/veh)	0.3												14.4			
Approach LOS													B			

NJDOT LOS Degradation Criteria



Job Description: Proposed Dunkin with Drive-Thru

DT Job #: 3334-99-001TE

Prepared by: C. Peregoy

Date: 10/21/2020

Intersection	Direction/ Movement		AM				PM				SAT			
			No Build	Allow.	Build	Build w/ Mit.	NB	Allow.	Build	Build w/ Mit.	NB	Allow.	Build	Build w/ Mit.
Route 206 & CR 518	EB	L	48.6	56.5	48.6	56.3	63.2	67.4	63.2	62.7	35.8	46.9	35.8	41.6
		TR	1.02	1.02	1.02	0.99	1.04	1.04	1.04	1.01	58.5	63.9	58.5	53.9
	WB	L	50.8	58.1	50.8	55.6	25.7	39.3	25.7	25.2	24.2	38.2	24.2	24.6
		TR	0.98	0.98	0.99	0.96	1.29	1.29	1.30	1.26	1.45	1.45	1.47	1.40
	NB	L	1.07	1.07	1.12	1.06	39.0	49.3	40.7	40.2	47.8	55.9	57.4	50.5
		TR	27.1	40.3	27.1	27.5	32.6	44.5	32.6	35.3	23.7	37.8	23.7	24.7
	SB	L	19.1	34.3	19.1	18.9	1.16	1.16	1.16	1.16	1.26	1.26	1.26	1.21
		TR	56.7	62.5	56.7	60.6	50.9	58.2	54.4	56.2	64.7	68.5	64.7	68.5
	Overall		64.0	N/A	65.7	59.5	80.1	N/A	80.9	78.1	87.4	N/A	89.8	83.7