



Memorandum

To: Mr. Dennis Miller
Main Street HP, LLC
PO Box 51299
Boston, Massachusetts

Date: May 19, 2022

Project #: 15700.00

From: Randy Hart, Principal
Ashley Domogala, EIT, Transportation Consultant

Re: Traffic Assessment
Proposed Redevelopment
575 Route 28
Harwich, Massachusetts

Introduction

Vanasse Hangen Brustlin, Inc. (VHB) on behalf of Main Street HP, LLC (the "Proponent") has prepared this traffic assessment memorandum to assess the redevelopment of the parcel located at 575 Route 28 in Harwich, Massachusetts (the "Site"). The Site is currently undeveloped. The proposed development includes a 3,000 sf restaurant space, an 850 sf coffee shop, 2,000 sf of general retail, and 5 apartments. The Site will be accessed via an existing driveway on Route 28, across from the Cumberland Farms driveway.

This memorandum summarizes the anticipated trip generation associated with the proposed development, and a sight distance evaluation at the Site driveway.

Crash Summary

A detailed crash analysis was conducted to identify potential vehicle crash trends and/or roadway deficiencies in the area of site access. The most current vehicle crash data for the traffic study area intersections were obtained from MassDOT for the years 2015 to 2019. The MassDOT database is comprised of crash data from the Massachusetts Registry of Motor Vehicles (RMV) Division primarily for use in traffic studies and safety evaluations. Data files are provided for an entire city or town for an entire year, though it is possible that some crash records may be omitted either due to individual crashes not being reported, or the city crash records not being provided in a compatible format for RMV use.

Crash rates are calculated based on the number of crashes at an intersection and the volume of traffic traveling through that intersection on a daily basis. Rates that exceed MassDOT's average for crashes at intersections in the MassDOT district in which the town or city is located could indicate safety or geometric issues for a particular intersection. The calculated crash rate for the Site driveway intersection was compared to the MassDOT District 5 (the MassDOT district for Harwich) average. The current MassDOT average crash rate for unsignalized intersections in District 5 is 0.57 crashes per million entering vehicles, the same as the statewide crash rate for unsignalized intersections. In other words, on average 0.57 crashes occurred per million vehicles entering unsignalized intersections throughout District 5.

A summary of the study area intersections vehicle crash history based on the available RMV data is presented in Table 1 and the detailed crash data is provided in the Attachments to this memorandum. The crash rate was estimated using historic volume data available from the MassDOT MS2 portal also provided in the Attachments.

Table 1 Vehicular Crash Data (2015 - 2019)

	Route 28 at Site Driveway/ Cumberland Farms Driveway
Signalized?	No
MassDOT Average Crash Rate	0.57
Calculated Crash Rate	0.14
Exceeds Average?	No
Year	
2015	0
2016	1
2017	1
2018	1
<u>2019</u>	<u>0</u>
Total	3
Yearly Average	0.6
Collision Type	
Angle	1
Head-on	0
Rear-end	0
Sideswipe, opposite direction	0
Sideswipe, same direction	1
Single Vehicle Crash	1
Not reported	0
Severity	
Fatal Injury	0
Non-Fatal Injury	1
Property Damage Only	2
Not Reported	0
Time of day	
Weekday ,7:00 AM - 9:00 AM	0
Weekday, 4:00 – 6:00 PM	0
Saturday 11:00 AM – 2:00 PM	0
Weekday, other time	3
Weekend, other time	0
Pavement Conditions	
Dry	3
Wet	0
Snow	0
Sand, mud, dirt, oil, gravel	0
Not reported	0
Non-Motorist (Bike, Ped)	0

Source: Crash data was obtained from MassDOT Crash Portal, accessed May 2022.

Highway Safety Improvement Program

In addition to calculating the crash rate, study area intersections should also be reviewed in the MassDOT's Highway Safety Improvement Program (HSIP) database. An HSIP-eligible cluster is one in which the total number of "equivalent property damage only"¹ crashes in the area is within the top 5% of all clusters in that region. Being HSIP-eligible makes the location eligible for FHWA and MassDOT funds to address the identified safety issues at these locations. As part of this effort, VHB reviewed this database and found that the intersection of Route 28 at the Site Driveway/Cumberland Farms Driveway is not a 2017-2019 HSIP-eligible location.

Trip Generation

To estimate the number of vehicle trips to be generated by the proposed redevelopment, traffic generation projections were prepared based on Institute of Transportation Engineers (ITE) *Trip Generation Manual*² data for Land Use Code (LUC) 220 (Multifamily Housing (Low-Rise)), LUC 932 (High-Turnover (Sit-Down) Restaurant), LUC 936 (Coffee/Donut Shop without Drive-Through Window), and LUC 822 (Strip Retail Plaza). Detailed trip generation calculations are included in the Attachments.

Unadjusted Project-Generated Traffic

Table 2 presents the Project-generated vehicle trips by land use based on ITE data.

¹ Equivalent property damage only" is a method of combining the number of crashes with the severity of the crashes based on a weighted scale. Crashes involving property damage only are reported at a minimal level of importance, while collisions involving personal injury (or fatalities) are weighted more heavily.

² Trip Generation Manual, 11th Edition, Institute of Transportation Engineers, Washington, D.C., 2021.

Table 2 Unadjusted Project-Generated Vehicle Trips

Time Period	<u>Residential</u> ¹	<u>Restaurant</u> ²	<u>Coffee Shop</u> ³	<u>Retail</u> ⁴	Total Unadjusted Vehicle Trips
Weekday Morning					
Enter	0	23	42	8	73
<u>Exit</u>	<u>2</u>	<u>18</u>	<u>40</u>	<u>8</u>	<u>68</u>
Total	2	41	82	16	141
Weekday Evening					
Enter	2	25	14	14	55
<u>Exit</u>	<u>1</u>	<u>24</u>	<u>14</u>	<u>12</u>	<u>51</u>
Total	3	49	28	26	106
Saturday Midday					
Enter	1	17	24	7	49
<u>Exit</u>	<u>1</u>	<u>17</u>	<u>24</u>	<u>6</u>	<u>48</u>
Total	2	34	48	13	97

Note: Peak hour trip generation based on peak hours of generator.

- 1 Trip generation estimate based on ITE LUC 220 (Multifamily Housing (Low-Rise)) for 5 units, using average rates.
- 2 Trip generation estimate based on ITE LUC 932 (High-Turnover (Sit-Down) Restaurant) for 3,000 sf, using average rates.
- 3 Trip generation estimate based on ITE LUC 936 (Coffee/Donut Shop without Drive-Through) for 850 sf, using average rates.
- 4 Trip generation estimate based on ITE LUC 822 (Strip Retail Plaza) for 2,000 sf, using average rates.

Person Trips

The unadjusted vehicle trips using the ITE data were converted into person trips by applying the average vehicle occupancy (AVO) of 1.18 for residential trips and of 1.82 for retail trips, as outlined by the U.S. Department of Transportation³. The national rates are applied when converting to person trips to be consistent with ITE data, which is also based on national data. The unadjusted vehicle trips were converted into person trips in order to apply internal capture credits, as described below.

Internal Capture Trips

Since the proposed development is a mixed-use project, the trip generation characteristics of the Site will be different from a single-use project. Some of the traffic to be generated by the proposed development will be contained on Site as “internal” or “shared vehicle” trips. For example, residents who live in the development may also shop at the retail uses. While these shared trips represent new traffic to the individual uses, they would not show up as new vehicle trips on the surrounding roadway network.

³ Summary of Travel Trends: 2017 National Household Survey, US Department of Transportation, Federal Highway Administration, Washington D.C., 2017.

As described in the ITE Trip Generation Handbook⁴, “because of the complementary nature of these land uses, some trips are made among the on-site uses. This capture of trips internal to the site has the net effect of reducing vehicle trip generation between the overall development site and the external street system (compared to the total number of trips generated by comparable land uses developed individually on stand-alone sites) an internal capture rate can generally be defined as the percentage of total person trips generated by a site that are made entirely within the site. The trip origin, destination, and travel path are all within the site.”

Project-Generated Trips

The net person trips with internal capture credits applied were converted back into vehicle trips by applying the same average vehicle occupancy (AVO) of 1.18 for residential trips and of 1.82 for retail trips.

Table 3 presents the Project-generated vehicle trips by land use with internal capture credits applied.

Table 3 Adjusted Project-Generated Vehicle Trips

Time Period	<u>Residential</u>	<u>Restaurant</u>	<u>Coffee Shop</u>	<u>Retail</u>	Total Adjusted Vehicle Trips
Weekday Morning					
Enter	0	23	41	8	72
<u>Exit</u>	<u>2</u>	<u>18</u>	<u>40</u>	<u>7</u>	<u>67</u>
Total	2	41	81	15	139
Weekday Evening					
Enter	1	23	13	7	44
<u>Exit</u>	<u>1</u>	<u>20</u>	<u>11</u>	<u>8</u>	<u>40</u>
Total	2	43	24	15	84
Saturday Midday					
Enter	1	16	23	3	43
<u>Exit</u>	<u>1</u>	<u>15</u>	<u>22</u>	<u>4</u>	<u>42</u>
Total	2	31	45	7	85

Note: Internal capture credit applied.

Pass-by Trips

While the ITE rates provide estimates for all the traffic associated with each land use, not all the traffic generated by the Project will be new to the area roadways. A portion of the vehicle-trips generated by the restaurant, coffee shop, and retail uses will likely be drawn from the traffic volume roadways adjacent to the Project Site. For example, someone traveling on Route 28 may choose to deviate from their original travel path to visit the coffee shop as an intermediate stop on their way to their ultimate destination. For this evaluation, ITE pass-by rates for LUC 932 (High-

⁴ Trip Generation Handbook, 3rd Edition, Institute of Transportation Engineers, Washington, D.C., 2017.

Turnover (Sit-Down) Restaurant) were utilized for the restaurant, and ITE pass-by rates for LUC 821 (Shopping Plaza) were utilized for the coffee shop and retail trip generation, as pass-by data for LUC 936 (Coffee/Donut Shop without Drive-Through Window) and LUC 822 (Strip Retail Plaza) is unavailable. Specifically, 43-percent of the restaurant trip generation and 40-percent of the coffee shop and retail trip generation was assumed to be drawn from the surrounding roadway network during the weekday evening peak hour based on ITE data. For all other time periods studied, a 25-percent pass-by rate was assumed. The pass-by trips are summarized in Table 4.

Table 4 Project-Generated Pass-by Trips

Time Period	<u>Restaurant Pass-by</u> ¹	<u>Coffee Shop Pass-by</u> ²	<u>Retail Pass-by</u> ³	Total Pass-by Trips
Weekday Morning				
Enter	5	10	2	17
<u>Exit</u>	<u>5</u>	<u>10</u>	<u>2</u>	<u>17</u>
Total	10	20	4	34
Weekday Evening				
Enter	9	5	3	17
<u>Exit</u>	<u>9</u>	<u>5</u>	<u>3</u>	<u>17</u>
Total	18	10	6	34
Saturday MIDDAY				
Enter	4	7	1	12
<u>Exit</u>	<u>4</u>	<u>7</u>	<u>1</u>	<u>12</u>
Total	8	14	2	24

- 1 Restaurant pass-by rates based on ITE LUC 932 (High-Turnover (Sit-Down) Restaurant), 25-percent pass-by rate assumed for time periods with no available data
- 2 Coffee shop pass-by rates based on ITE LUC 821 (Shopping Plaza), 25-percent pass-by rate assumed for time periods with no available data
- 3 Retail pass-by rates based on ITE LUC 821 (Shopping Plaza), 25-percent pass-by rate assumed for time periods with no available data

Net Project-Generated Trips

Table 5 presents the net new Project-generated vehicle trips by land use. It should also be noted that for a conservative estimate, no credit was taken for transit, bike, or walk trips.

Table 5 Net New Project-Generated Vehicle Trips

Time Period	Total Vehicle Trips ¹	Total Pass-by Trips ²	Net New Vehicle Trips ³
Weekday Morning			
Enter	72	17	55
<u>Exit</u>	<u>67</u>	<u>17</u>	<u>50</u>
Total	139	34	105
Weekday Evening			
Enter	44	17	27
<u>Exit</u>	<u>40</u>	<u>17</u>	<u>23</u>
Total	84	34	50
Saturday Midday			
Enter	43	12	31
<u>Exit</u>	<u>42</u>	<u>12</u>	<u>30</u>
Total	85	24	61

1 From Table 3

2 From Table 4

3 Net new vehicle trips = total vehicle trips – total pass-by trips

As shown in Table 5, the Project is expected to generate approximately 105 net new vehicle trips (55 entering/ 50 exiting) during the weekday morning peak hour, 50 net new vehicle trips (27 entering/ 23 exiting) during the weekday evening peak hour, and 61 net new vehicle trips (31 entering/ 30 exiting) during the Saturday midday peak hour.

Sight Distance Evaluation

VHB conducted a sight distance evaluation for the Site driveway. Measurements were taken for Stopping Sight Distance and Intersection Sight Distance at these intersections in accordance with guidelines provided by the American Association of State Highway and Transportation Officials (AASHTO).

Sight distance considerations are divided into two categories: Stopping Sight Distance (SSD) and Intersection Sight Distance (ISD). Stopping sight distance (SSD) is the distance required for a vehicle approaching an intersection from either direction to perceive, react and come to a complete stop to avoid colliding with an object in the road. In this respect, SSD can be considered as the minimum visibility criterion for the safe operation of an unsignalized intersection. Intersection sight distance (ISD) is based on the time required for perception, reaction, and completion of the desired critical exiting maneuver (typically, a left turn) once the driver on a minor street approach (or a driveway) decides to execute the maneuver. Calculations for ISD include the time to (1) turn left and clear the near half of the intersection without conflicting with the vehicles approaching from the left; and (2) upon turning left, to accelerate to the operating speed on the roadway without causing approaching vehicles on the main road to unduly reduce their speed. In this context, ISD can be considered as a desirable visibility criterion for the safe operation of an unsignalized intersection. The AASHTO sight distance criteria are included in the Attachments.

Table 6 presents a summary of the ISD and SSD analysis. The analysis assumes 85th percentile speeds of 30 mph traveling in both directions along Route 28, which is 5 mph above the posted speed limit of 25 mph.

Table 6 Sight Distance Summary

Location	Stopping Sight Distance (feet)		Intersection Sight Distance (feet)	
	Required ¹	Measured	Desirable	Measured
Route 28 at Site Driveway				
East of Site Driveway SSD/Looking Right ISD	200	750+	335	500+
West of Site Driveway SSD/Looking Left ISD	200	750+	335	500+

¹ Based on guidelines established in A Policy on the Geometric Design of Highways and Streets, 7th Edition, American Association of State Highway and Transportation Officials (AASHTO), 2018.

As shown in Table 6, the available SSD and ISD at the Site driveway exceed the minimum requirements.

Conclusion

The Site located at 575 Route 28 in Harwich, Massachusetts is proposed to be developed with a 3,000 sf restaurant space, an 850 sf coffee shop, 2,000 sf of general retail, and 5 apartments.

As demonstrated, the proposed redevelopment will result in approximately 105 net new vehicle trips in the weekday morning peak hour, 50 net new vehicle trips in the weekday evening peak hour, and approximately 61 net new vehicle trips in the Saturday midday peak hour.

Review of the Site driveway under the redevelopment condition suggests that the both the SSD and ISD minimums are exceeded and therefore the proposed access configuration is appropriate.

Traffic Assessment – 575 Route 28 Harwich, Massachusetts
Ref: 15700.00
May 19, 2022



Attachments

- › Crash Data
- › Trip Generation
- › Sight Distance

Traffic Assessment – 575 Route 28 Harwich, Massachusetts
Ref: 15700.00
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Crash Data

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Harwich

COUNT DATE : June 2013 (grown)

DISTRICT : 5

UNSIGNALIZED : X
0.57

SIGNALIZED :
0.73

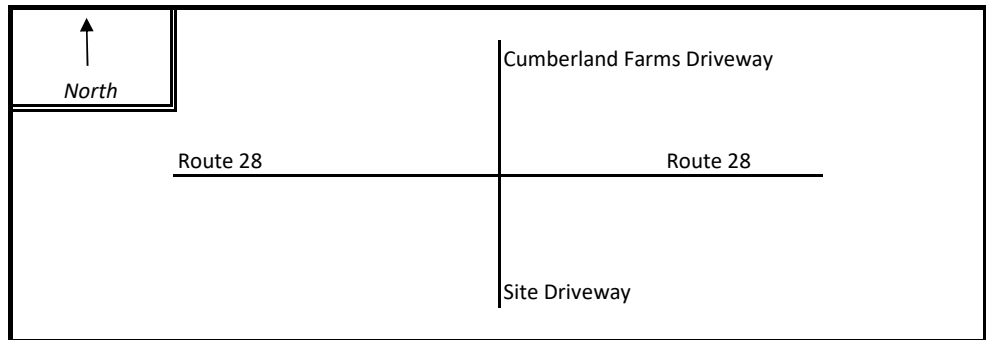
~ INTERSECTION DATA ~

MAJOR STREET : Route 28

MINOR STREET(S) : Cumberland Farms Driveway

Site Driveway

**INTERSECTION
DIAGRAM**
(Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	WB	NB	SB		
PEAK HOURLY VOLUMES (AM/PM) :	465	510				975

" K " FACTOR : 0.083 INTERSECTION ADT (V) = TOTAL DAILY APPROACH VOLUME : 11,747

TOTAL # OF CRASHES : 3 # OF YEARS : 5 AVERAGE # OF CRASHES PER YEAR (A) : 0.60

CRASH RATE CALCULATION : 0.14

$$\text{RATE} = \frac{(A * 1,000,000)}{(V * 365)}$$

Comments : MassDOT Crash Data (2015-2019), "k" factor from June 2013 ATR on Route 28 west of Bank Street for 4-5 PM
 Project Title & Date: 15700.00 575 Route 28

MassDOT Crash Data 2015-2019: Route 28 at Site Driveway/Cumberland Farms Driveway

Crash Number	City Town Name	Crash Date	Crash Severity	Crash Time	Max Injury Severity Reported	Number of Vehicles	Police Agency Type	Age of Driver - Youngest Known	Age of Driver - Oldest Known	Driver Contributing Circumstances (All Drivers)	Light Conditions	Manner of Collision	Non-Motorist Type (All Persons)	Road Surface Condition	Total Fatalities	Total Non-Fatal Injuries	Vehicle Actions Prior to Crash (All Vehicles)	Vehicle Configuration (All Vehicles)	Vehicle Travel Directions (All Vehicles)	Weather Conditions	Crash Report IDs	Most Harmful Event (All Vehicles)	Street Number	Roadway	Near Intersection Roadway
4179192	HARWICH	04/12/2016	Non-fatal injury	1:53 PM	Non-fatal injury - Non-incapacitating	2	Local police	55-64	55-64	D1: (No improper driving) / D2: (Wrong side or wrong way)	Daylight	Angle		Dry	0	1	V1: Travelling straight ahead / V2: Leaving traffic lane	V1:(Passenger car) / V2:(Passenger car)	V1: W / V2: E	Cloudy	16-4577-AC	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	578	RT 28	BANK STREET
4409497	HARWICH	08/10/2017	Property damage only (none injured)	8:39 PM	No injury	2	Local police	35-44	65-74	D1: (No improper driving) / D2: (No improper driving)	Dark - lighted roadway	Sideswipe, opposite direction		Dry	0	0	V1: Slowing or stopped in traffic / V2: Travelling straight ahead	V1:(Light truck(van, mini-van, pickup, sport utility)) / V2:(Passenger car)	V1: E / V2: W	Clear	17-10936-AC	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	578	ROUTE 28	
4557582	HARWICH	06/15/2018	Property damage only (none injured)	1:43 PM	No injury	2	Local police	45-54	65-74	D1: (Inattention) / D2: (No improper driving)	Daylight	Sideswipe, same direction		Dry	0	0	V1: Entering traffic lane / V2: Travelling straight ahead	V1:(Passenger car) / V2:(Passenger car)	V1: W / V2: W	Clear	18-6953-AC	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	578	RT 28	

Volume By Hour By Week for 6/9/2013 - 6/15/2013
Criteria: Location ID = RPA11-126-20504, From 1/1/1900 To 12/31/2049 12:00:00 AM

District : Location ID : RPA11-126-20504 County : Barnstable SF Group :
Located On : ROUTE 28 Functional Class : (3) Other Principal Arterial Area Type : Urban

YEAR	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	
AADT																					8870

Start Time	Monday	Tuesday	Wednesday	Avg	Avg Volume Graph	Pct. of Total
	6/10/2013	6/11/2013	6/12/2013			
12:00 AM		26	28	27		0.3%
1:00 AM		20	26	23		0.2%
2:00 AM		16	11	14		0.1%
3:00 AM		7	13	10		0.1%
4:00 AM		10	16	13		0.1%
5:00 AM		47	74	61		0.6%
6:00 AM		158	183	171		1.7%
7:00 AM		381	441	411		4.0%
8:00 AM		518	602	560		5.5%
9:00 AM		614	662	638		6.3%
10:00 AM		762	732	747		7.3%
11:00 AM		877	810	844		8.3%
12:00 PM		823	839	831		8.2%
1:00 PM	847	880		864		8.5%
2:00 PM	850	911		881		8.6%
3:00 PM	865	867		866		8.5%
4:00 PM	880	856		868		8.5%
5:00 PM	720	662		691		6.8%
6:00 PM	526	562		544		5.3%
7:00 PM	418	464		441		4.3%
8:00 PM	290	309		300		2.9%
9:00 PM	183	237		210		2.1%
10:00 PM	114	140		127		1.2%
11:00 PM	50	38		44		0.4%
Total	5743	10185	4437	Avg		
AM Pk Hr		11:00 AM	11:00 AM			
AM Peak		877	810	844		
PM Pk Hr		2:00 PM				
PM Peak		911		911		
Peak %		8.94%		8.94%		

Volume By Hour By Week for 6/9/2013 - 6/15/2013

Criteria: Location ID = RPA11-126-20504, From 1/1/1900 To 12/31/2049 12:00:00 AM

Count Start:	13:00:00	13:00:00
Start	6/10/2013	6/11/2013
End	6/11/2013	6/12/2013
24h Total	10002	10363

Volume By Hour By Week for 6/9/2013 - 6/15/2013
Criteria: Location ID = RPA11-126-20504, From 1/1/1900 To 12/31/2049 12:00:00 AM

District : Location ID : RPA11-126- County : Barnstable SF Group :
 Located On : ROUTE 28 Functional Class : (3) Other Principal Arterial Area Type : Urban

YEAR	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	
AADT																					4401

Start Time	Monday 6/10/2013	Tuesday 6/11/2013	Wednesday 6/12/2013	Avg	Avg Volume Graph	Pct. of Total
12:00 AM		13	13	13		0.3%
1:00 AM		7	13	10		0.2%
2:00 AM		5	6	6		0.1%
3:00 AM		4	8	6		0.1%
4:00 AM		4	11	8		0.1%
5:00 AM		22	30	26		0.5%
6:00 AM		92	106	99		2.0%
7:00 AM		213	239	226		4.5%
8:00 AM		248	282	265		5.2%
9:00 AM		314	339	327		6.5%
10:00 AM		384	365	375		7.4%
11:00 AM		450	442	446		8.8%
12:00 PM		408	401	405		8.0%
1:00 PM	411	433		422		8.3%
2:00 PM	404	470		437		8.6%
3:00 PM	392	413		403		8.0%
4:00 PM	409	405		407		8.1%
5:00 PM	330	307		319		6.3%
6:00 PM	258	277		268		5.3%
7:00 PM	216	223		220		4.3%
8:00 PM	161	167		164		3.2%
9:00 PM	94	135		115		2.3%
10:00 PM	62	76		69		1.4%
11:00 PM	27	20		24		0.5%
Total	2764	5090	2255	Avg		
AM Pk Hr		11:00 AM	11:00 AM			
AM Peak		450	442	446		
PM Pk Hr		2:00 PM				
PM Peak		470		470		
Peak %		9.23%		9.23%		

Volume By Hour By Week for 6/9/2013 - 6/15/2013
Criteria: Location ID = RPA11-126-20504, From 1/1/1900 To 12/31/2049 12:00:00 AM

District :
Located On : ROUTE 28

Location ID : RPA11-126-

County : Barnstable

Functional Class : (3) Other Principal Arterial

SF Group :

Area Type : Urban

YEAR	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	
AADT																					4469

Start Time	Monday	Tuesday	Wednesday	Avg	Avg Volume Graph	Pct. of Total
	6/10/2013	6/11/2013	6/12/2013			
12:00 AM		13	15	14		0.3%
1:00 AM		13	13	13		0.3%
2:00 AM		11	5	8		0.2%
3:00 AM		3	5	4		0.1%
4:00 AM		6	5	6		0.1%
5:00 AM		25	44	35		0.7%
6:00 AM		66	77	72		1.4%
7:00 AM		168	202	185		3.6%
8:00 AM		270	320	295		5.8%
9:00 AM		300	323	312		6.1%
10:00 AM		378	367	373		7.3%
11:00 AM		427	368	398		7.8%
12:00 PM		415	438	427		8.3%
1:00 PM	436	447		442		8.6%
2:00 PM	446	441		444		8.6%
3:00 PM	473	454		464		9.0%
4:00 PM	471	451		461		9.0%
5:00 PM	390	355		373		7.3%
6:00 PM	268	285		277		5.4%
7:00 PM	202	241		222		4.3%
8:00 PM	129	142		136		2.6%
9:00 PM	89	102		96		1.9%
10:00 PM	52	64		58		1.1%
11:00 PM	23	18		21		0.4%
Total	2979	5095	2182	Avg		
AM Pk Hr		11:00 AM	11:00 AM			
AM Peak		427	368	398		
PM Pk Hr		3:00 PM				
PM Peak		454		454		
Peak %		8.91%		8.91%		

Volume By Hour By Week for 6/9/2013 - 6/15/2013**Criteria: Location ID = RPA11-126-20504, From 1/1/1900 To 12/31/2049 12:00:00 AM**

Count Start:	13:00:00	13:00:00
Start	6/10/2013	6/11/2013
End	6/11/2013	6/12/2013
24h Total	4928	5181

Volume By Hour By Week for 6/9/2013 - 6/15/2013**Criteria: Location ID = RPA11-126-20504, From 1/1/1900 To 12/31/2049 12:00:00 AM**

Count Start:	13:00:00	13:00:00
Start	6/10/2013	6/11/2013
End	6/11/2013	6/12/2013
24h Total	5074	5182

MassDOT Yearly Growth Rates

for data from 2014 to 2018

Growth					
Group	Grow 2014 to 2015	Grow 2015 to 2016	Grow 2016 to 2017	Grow 2017 to 2018	Grow 2018 to 2019
R1	0	0.023	0.004	0.018	0.016
R2	0.05	0.068	0.004	0.014	0.014
R3	-0.038	0.002	0.008	0.011	0.06
R4-7	-0.01	0.003	0.001	0.011	0.012
Rec - East		0.032	0.02	0.041	0.025
Rec - West		0.051	-0.008	0.029	0
U1-Boston	0.061	0.07	-0.003	0.012	0.006
U1-Essex	0.024	0.025	0.007	0.014	0.011
U1-Southeast	0.05	0.062	0.021	0.014	0
U1-West	0.03	-0.027	0.02	0.028	0.013
U1-Worcester	0.042	0.005	0.018	0.01	0.01
U2	0.04	0.048	0.008	0.01	0.02
U3	0.011	0.013	0.011	0.014	0.004
U4-7	0.023	0.062	0.017	0.003	-0.004

updated 5/1/2020

Growth Factors Used	
2013 to 2014	1.011
2014 to 2015	1.011
2015 to 2016	1.032
2016 to 2017	1.02
2017 to 2018	1.041
2018 to 2019	1.025
Final Adjustment	1.148

LUC SIZE	Full Build																		Net New												
	Residential ¹					Restaurant ²						Coffee Shop ³						Retail ⁴					Gross Trips	Net Person Trips	Total Vehicle Trips	Pass-By	Net New Vehicle Trips				
	Gross Trips	Gross Person Trips ⁵	Internal Capture ⁶	Net Person Trips	Vehicle Trips ⁷	Gross Trips	Gross Person Trips ⁵	Internal Capture ⁶	Net Person Trips	Vehicle Trips ⁸	Pass-by ⁹	Net Vehicle Trips	Gross Trips	Gross Person Trips ⁵	Internal Capture ⁶	Net Person Trips	Vehicle Trips ⁸	Pass-by ¹⁰	Net Vehicle Trips	Gross Trips	Gross Person Trips ⁵	Internal Capture ⁶						Net Person Trips	Vehicle Trips ⁸	Pass-by ¹¹	Net Vehicle Trips
	1.18					1.82						1.82						1.82													
Weekday Morning Peak Hour											25%						25%						25%								
Enter	-	-	-	-	-	23	42	1	41	23	5	18	42	76	1	75	41	10	31	8	15	1	14	8	2	6	73	130	72	17	55
Exit	2	2	-	2	2	18	33	0	33	18	5	13	40	73	1	72	40	10	30	8	15	2	13	7	2	5	68	120	67	17	50
Total	2	2	-	2	2	41	75	1	74	41	10	31	82	149	2	147	81	20	61	16	30	3	27	15	4	11	141	250	139	34	105
Weekday Evening Peak Hour											43%						40%						40%								
Enter	2	2	1	1	1	25	46	4	42	23	9	14	14	25	2	23	13	5	8	14	25	13	12	7	3	4	55	78	44	17	27
Exit	1	1	-	1	1	24	44	8	36	20	9	11	14	25	5	20	11	5	6	12	22	7	15	8	3	5	51	72	40	17	23
Total	3	3	1	2	2	49	90	12	78	43	18	25	28	50	7	43	24	10	14	26	47	20	27	15	6	9	106	150	84	34	50
Saturday Midday Peak Hour											25%						31%						31%								
Enter	1	1	-	1	1	17	31	1	30	16	4	12	24	44	2	42	23	7	16	7	13	7	6	3	1	2	49	79	43	12	31
Exit	1	1	-	1	1	17	31	3	28	15	4	11	24	44	4	40	22	7	15	6	11	3	8	4	1	3	48	77	42	12	30
Total	2	2	-	2	2	34	62	4	58	31	8	23	48	88	6	82	45	14	31	13	24	10	14	7	2	5	97	156	85	24	61

Note: Peak hours refer to peak hour of generator. No transit or walk/bike trips assumed for a conservative analysis.

1 Trip generation estimate based on ITE LUC 220 (Multifamily Housing (Low-Rise)), using average rates.

2 Trip generation estimate based on ITE LUC 932 (High-Turnover (Sit-Down) Restaurant), using average rates.

3 Trip generation estimate based on ITE LUC 936 (Coffee/Donut Shop without Drive-Through), using average rates.

4 Trip generation estimate based on ITE LUC 822 (Strip Retail Plaza), using average rates.

5 VOR rates for gross person trips based on Summary of Travel Trends, 2017 National Household Travel Survey, USDOT FHA

6 Internal capture rates based on NCHRP Report 684, Saturday midday rates assumed to be the same as weekday evening rates

7 Residential VOR rates based on Summary of Travel Trends, 2017 National Household Travel Survey, USDOT FHA

8 Restaurant/retail VOR rates based on Summary of Travel Trends, 2017 National Household Travel Survey, USDOT FHA

9 Restaurant pass-by rates based on ITE LUC 932 (High-Turnover (Sit-Down) Restaurant), 25-percent pass-by rate assumed for time periods with no available data

10 Coffee shop pass-by rates based on ITE LUC 821 (Shopping Plaza), 25-percent pass-by rate assumed for time periods with no available data

11 Retail pass-by rates based on ITE LUC 821 (Shopping Plaza), 25-percent pass-by rate assumed for time periods with no available data

SHARED TRIPS ¹

RETAIL - RESIDENTIAL							RESTAURANT - RESIDENTIAL							RETAIL - RESTAURANT							SUMMARY			
WEEKDAY MORNING							WEEKDAY MORNING							WEEKDAY MORNING							TOTAL SHARED TRIPS - WEEKDAY MORNING			
RETAIL	%	#	BALANCED	#	%	RESIDENTIAL	RESTAURANT	%	#	BALANCED	#	%	RESIDENTIAL	RETAIL	%	#	BALANCED	#	%	RESTAURANT	ENTER	EXIT	TOTAL	
EXIT ->	14%	15	0	0	2%	-> ENTER	EXIT ->	4%	106	0	0	5%	-> ENTER	EXIT ->	13%	15	2	118	50%	-> ENTER	RESTAURANT	2	1	3
ENTER <-	17%	15	0	2	1%	<- EXIT	ENTER <-	20%	118	0	2	20%	<- EXIT	ENTER <-	8%	15	1	106	14%	<- EXIT	RETAIL	1	2	3
																					RESIDENTIAL	0	0	0
																					TOTAL	3	3	6
WEEKDAY EVENING							WEEKDAY EVENING							WEEKDAY EVENING							TOTAL SHARED TRIPS - WEEKDAY EVENING			
RETAIL	%	#	BALANCED	#	%	RESIDENTIAL	RESTAURANT	%	#	BALANCED	#	%	RESIDENTIAL	RETAIL	%	#	BALANCED	#	%	RESTAURANT	ENTER	EXIT	TOTAL	
EXIT ->	26%	22	1	2	46%	-> ENTER	EXIT ->	18%	71	0	2	16%	-> ENTER	EXIT ->	29%	22	6	69	29%	-> ENTER	RESTAURANT	6	13	19
ENTER <-	10%	25	0	1	42%	<- EXIT	ENTER <-	14%	69	0	1	21%	<- EXIT	ENTER <-	50%	25	13	71	41%	<- EXIT	RETAIL	13	7	20
																					RESIDENTIAL	1	0	1
																					TOTAL	20	20	40
SATURDAY MIDDAY							SATURDAY MIDDAY							SATURDAY MIDDAY							TOTAL SHARED TRIPS - SATURDAY MIDDAY			
RETAIL	%	#	BALANCED	#	%	RESIDENTIAL	RESTAURANT	%	#	BALANCED	#	%	RESIDENTIAL	RETAIL	%	#	BALANCED	#	%	RESTAURANT	ENTER	EXIT	TOTAL	
EXIT ->	26%	11	0	1	46%	-> ENTER	EXIT ->	18%	75	0	1	16%	-> ENTER	EXIT ->	29%	11	3	75	29%	-> ENTER	RESTAURANT	3	7	10
ENTER <-	10%	13	0	1	42%	<- EXIT	ENTER <-	14%	75	0	1	21%	<- EXIT	ENTER <-	50%	13	7	75	41%	<- EXIT	RETAIL	7	3	10
																					RESIDENTIAL	0	0	0
																					TOTAL	10	10	20

¹ Weekday morning and evening internal capture rates based on NCHRP Report 684, Saturday midday rates assumed to be the same as weekday evening rates

Traffic Assessment – 575 Route 28 Harwich, Massachusetts
Ref: 15700.00
May 19, 2022



Trip Generation

ITE TRIP GENERATION WORKSHEET

(11th Edition, Updated 2021)

LANDUSE: Multi-Family Housing (Low-Rise): 2-3 Story - Not Close to Rail Transit
LANDUSE CODE: 220 Independent Variable --- Number of Dwelling Units
SETTING/LOCATION: General Urban/Suburban
JOB NAME: 575 Route 28, Harwich 5 units
JOB NUMBER: 15700.00

WEEKDAY

RATES:	# Studies	R^2	Total Trip Ends			Independent Variable Range			Directional Distribution	
			Average	Low	High	Average	Low	High	Enter	Exit
DAILY	22	0.86	6.74	2.46	12.50	229	33	494	50%	50%
AM PEAK OF GENERATOR	40	0.76	0.47	0.25	0.98	234	12	1,103	24%	76%
PM PEAK OF GENERATOR	38	0.80	0.57	0.25	1.26	231	12	1,103	62%	38%
AM PEAK (ADJACENT ST)	49	0.79	0.40	0.13	0.73	249	12	1,103	24%	76%
PM PEAK (ADJACENT ST)	59	0.84	0.51	0.08	1.04	241	12	1,103	63%	37%

TRIPS:

	BY AVERAGE			BY REGRESSION		
	Total	Enter	Exit	Total	Enter	Exit
DAILY	34	17	17	108	54	54
AM PEAK OF GENERATOR	2	0	2	30	7	23
PM PEAK OF GENERATOR	3	2	1	37	23	14
AM PEAK (ADJACENT ST)	2	0	2	24	6	19
PM PEAK (ADJACENT ST)	3	2	1	24	15	9

SATURDAY

RATES:	# Studies	R^2	Total Trip Ends			Independent Variable Range			Directional Distribution	
			Average	Low	High	Average	Low	High	Enter	Exit
DAILY	1	--	4.55	4.55	4.55	282	282	282	50%	50%
PEAK OF GENERATOR	1	--	0.41	0.41	0.41	282	282	282	51%	49%

TRIPS:

	BY AVERAGE			BY REGRESSION		
	Total	Enter	Exit	Total	Enter	Exit
DAILY	24	12	12	--	--	--
PEAK OF GENERATOR	2	1	1	--	--	--

SUNDAY

RATES:	# Studies	R^2	Total Trip Ends			Independent Variable Range			Directional Distribution	
			Average	Low	High	Average	Low	High	Enter	Exit
DAILY	1	--	3.86	3.86	3.86	282	282	282	50%	50%
PEAK OF GENERATOR	1	--	0.36	0.36	0.36	282	282	282	55%	45%

TRIPS:

	BY AVERAGE			BY REGRESSION		
	Total	Enter	Exit	Total	Enter	Exit
DAILY	20	10	10	--	--	--
PEAK OF GENERATOR	2	1	1	--	--	--

ITE TRIP GENERATION WORKSHEET
 (11th Edition, Updated 2021)

LANDUSE: High-Turnover (Sit-Down) Restaurant
 LANDUSE CODE: 932 Independent Variable --- 1,000 Sq. Feet Gross Floor Area
 SETTING/LOCATION: General Urban/Suburban
 JOB NAME: 575 Route 28, Harwich FLOOR AREA (KSF): 3.000
 JOB NUMBER: 15700.00

WEEKDAY

RATES:	# Studies	R^2	Total Trip Ends			Independent Variable Range			Directional Distribution	
			Average	Low	High	Average	Low	High	Enter	Exit
DAILY	50	--	107.20	13.04	742.41	5	2	11	50%	50%
AM PEAK OF GENERATOR	58	--	13.68	1.74	112.49	6	1	11	57%	43%
PM PEAK OF GENERATOR	58	--	16.35	3.04	89.99	5	1	11	51%	49%
AM PEAK (ADJACENT ST)	37	--	9.57	0.76	102.39	5	1	11	55%	45%
PM PEAK (ADJACENT ST)	104	--	9.05	0.92	62.00	6	1	14	61%	39%

TRIPS:

	BY AVERAGE			BY REGRESSION		
	Total	Enter	Exit	Total	Enter	Exit
DAILY	322	161	161	--	--	--
AM PEAK OF GENERATOR	41	23	18	--	--	--
PM PEAK OF GENERATOR	49	25	24	--	--	--
AM PEAK (ADJACENT ST)	29	16	13	--	--	--
PM PEAK (ADJACENT ST)	27	17	11	--	--	--

SATURDAY

RATES:	# Studies	R^2	Total Trip Ends			Independent Variable Range			Directional Distribution	
			Average	Low	High	Average	Low	High	Enter	Exit
DAILY	3	--	122.40	101.99	173.07	6	5	9	50%	50%
PEAK OF GENERATOR	22	--	11.19	1.63	50.40	5	2	12	51%	49%

TRIPS:

	BY AVERAGE			BY REGRESSION		
	Total	Enter	Exit	Total	Enter	Exit
DAILY	367	184	184	--	--	--
PEAK OF GENERATOR	34	17	17	--	--	--

SUNDAY

RATES:	# Studies	R^2	Total Trip Ends			Independent Variable Range			Directional Distribution	
			Average	Low	High	Average	Low	High	Enter	Exit
DAILY	2	--	142.64	119.62	164.43	5	4.8	5.1	50%	50%
PEAK OF GENERATOR	3	--	25.83	9.81	43.20	4	2.5	5.1	55%	45%

TRIPS:

	BY AVERAGE			BY REGRESSION		
	Total	Enter	Exit	Total	Enter	Exit
DAILY	428	214	214	--	--	--
PEAK OF GENERATOR	77	43	35	--	--	--

ITE TRIP GENERATION WORKSHEET
 (11th Edition, Updated 2021)

LANDUSE: Coffee/Donut Shop without Drive-Through
LANDUSE CODE: 936 Independent Variable --- 1,000 Sq. Feet Gross Floor Area
SETTING/LOCATION: General Urban/Suburban
JOB NAME: 575 Route 28, Harwich **FLOOR AREA (KSF):** 0.850
JOB NUMBER: 15700.00

WEEKDAY

RATES:	# Studies	R^2	Total Trip Ends			Independent Variable Range			Directional Distribution	
			Average	Low	High	Average	Low	High	Enter	Exit
DAILY	--	--	--	--	--	--	--	--	--	--
AM PEAK OF GENERATOR	23	--	96.43	50.00	255.48	2	1	3	51%	49%
PM PEAK OF GENERATOR	15	--	32.99	15.50	74.84	2	1	3	50%	50%
AM PEAK (ADJACENT ST)	25	--	93.08	38.76	255.48	2	1	3	51%	49%
PM PEAK (ADJACENT ST)	16	--	32.29	15.50	74.84	2	1	3	50%	50%

TRIPS:	BY AVERAGE			BY REGRESSION		
	Total	Enter	Exit	Total	Enter	Exit
DAILY	--	--	--	--	--	--
AM PEAK OF GENERATOR	82	42	40	--	--	--
PM PEAK OF GENERATOR	28	14	14	--	--	--
AM PEAK (ADJACENT ST)	79	40	39	--	--	--
PM PEAK (ADJACENT ST)	27	14	14	--	--	--

SATURDAY

RATES:	# Studies	R^2	Total Trip Ends			Independent Variable Range			Directional Distribution	
			Average	Low	High	Average	Low	High	Enter	Exit
DAILY	--	--	--	--	--	--	--	--	--	--
PEAK OF GENERATOR	7	--	56.50	33.93	117.42	2	1	3	49%	51%

TRIPS:	BY AVERAGE			BY REGRESSION		
	Total	Enter	Exit	Total	Enter	Exit
DAILY	--	--	--	--	--	--
PEAK OF GENERATOR	48	24	24	--	--	--

SUNDAY

RATES:	# Studies	R^2	Total Trip Ends			Independent Variable Range			Directional Distribution	
			Average	Low	High	Average	Low	High	Enter	Exit
DAILY	--	--	--	--	--	--	--	--	--	--
PEAK OF GENERATOR	--	--	--	--	--	--	--	--	--	--

TRIPS:	BY AVERAGE			BY REGRESSION		
	Total	Enter	Exit	Total	Enter	Exit
DAILY	--	--	--	--	--	--
PEAK OF GENERATOR	--	--	--	--	--	--

ITE TRIP GENERATION WORKSHEET
 (11th Edition, Updated 2021)

LANDUSE: Strip Retail Plaza (<40k)
LANDUSE CODE: 822
SETTING/LOCATION: General Urban/Suburban
JOB NAME: 575 Route 28, Harwich
JOB NUMBER: 15700.00

Independent Variable --- 1,000 Sq. Feet Gross Floor Area

FLOOR AREA (KSF): 2.000

WEEKDAY

RATES:	# Studies	R^2	Total Trip Ends			Independent Variable Range			Directional Distribution	
			Average	Low	High	Average	Low	High	Enter	Exit
DAILY	4	0.96	54.45	47.86	65.07	19	9	35	50%	50%
AM PEAK OF GENERATOR	6	--	7.60	2.40	21.30	16	8	24	50%	50%
PM PEAK OF GENERATOR	5	--	13.24	6.27	24.11	16	8	24	54%	46%
AM PEAK (ADJACENT ST)	5	0.57	2.36	1.60	3.73	18	9	35	60%	40%
PM PEAK (ADJACENT ST)	25	0.56	6.59	2.81	15.20	21	3	39	50%	50%

TRIPS:

	BY AVERAGE			BY REGRESSION		
	Total	Enter	Exit	Total	Enter	Exit
DAILY	110	55	55	316	158	158
AM PEAK OF GENERATOR	16	8	8	--	--	--
PM PEAK OF GENERATOR	26	14	12	--	--	--
AM PEAK (ADJACENT ST)	5	3	2	10	6	4
PM PEAK (ADJACENT ST)	14	7	7	25	12	12

SATURDAY

RATES:	# Studies	R^2	Total Trip Ends			Independent Variable Range			Directional Distribution	
			Average	Low	High	Average	Low	High	Enter	Exit
DAILY	--	--	--	--	--	--	--	--	--	--
PEAK OF GENERATOR	12	--	6.57	1.88	14.23	27	8	39	51%	49%

TRIPS:

	BY AVERAGE			BY REGRESSION		
	Total	Enter	Exit	Total	Enter	Exit
DAILY	--	--	--	--	--	--
PEAK OF GENERATOR	13	7	6	--	--	--

SUNDAY

RATES:	# Studies	R^2	Total Trip Ends			Independent Variable Range			Directional Distribution	
			Average	Low	High	Average	Low	High	Enter	Exit
DAILY	--	--	--	--	--	--	--	--	--	--
PEAK OF GENERATOR	--	--	--	--	--	--	--	--	--	--

TRIPS:

	BY AVERAGE			BY REGRESSION		
	Total	Enter	Exit	Total	Enter	Exit
DAILY	--	--	--	--	--	--
PEAK OF GENERATOR	--	--	--	--	--	--

Traffic Assessment – 575 Route 28 Harwich, Massachusetts
Ref: 15700.00
May 19, 2022



Sight Distance

Stopping Sight Distance and Intersection Sight Distance Calculator [v0.97]
Based on 'A Policy on Geometric Design of Highways and Streets', AASHTO, 2004

Section I				Section III																																																																																																																																																																																																																	
Project Information				ISD and SSD Calculations (rounded up to the next highest 5 feet) [sources: SSD - AASHTO, pp.110-117; ISD - AASHTO, pp. 650 - 664]																																																																																																																																																																																																																	
Project Number:	15700.00	Analyst:	VHB	<i>Cases are described in detail on subsequent pages. In summary...</i>																																																																																																																																																																																																																	
City/Town, State:	Harwich, MA	Client:		B1: left turn from minor road, from stop control																																																																																																																																																																																																																	
Location:	Route 28 at Site Driveway			B2: right turn from minor road, from stop control																																																																																																																																																																																																																	
Street Names and Directions				Street Notes																																																																																																																																																																																																																	
Major Street name:	Route 28	EB/WB	▼	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 40%; padding: 2px;">Desirable Calculated...</td> <td style="width: 20%;"></td> <td style="width: 20%;"></td> <td style="width: 20%;"></td> <td style="width: 20%;"></td> <td style="width: 20%;"></td> </tr> <tr> <td style="padding: 2px;">... ISD, case B1:</td> <td style="padding: 2px; text-align: center;">335</td> <td style="padding: 2px;"></td> <td style="padding: 2px;"></td> <td style="padding: 2px; text-align: center;">Condition Met?</td> <td style="padding: 2px; text-align: center;">Yes</td> </tr> <tr> <td style="padding: 2px;">... ISD, case B2:</td> <td style="padding: 2px; text-align: center;">290</td> <td style="padding: 2px;"></td> <td style="padding: 2px;"></td> <td style="padding: 2px; text-align: center;">Yes</td> <td style="padding: 2px;"></td> </tr> <tr> <td style="padding: 2px;">... ISD, case B3:</td> <td style="padding: 2px; text-align: center;">290</td> <td style="padding: 2px;"></td> <td style="padding: 2px;"></td> <td style="padding: 2px; text-align: center;">Yes</td> <td style="padding: 2px;"></td> </tr> <tr> <td colspan="6" style="padding: 2px; text-align: center;"><small>[note: if number of lanes crossed exceeds 6, or if grades are steep, consult the manual]</small></td> </tr> <tr> <td style="padding: 2px;">Minor Street name:</td> <td style="padding: 2px;">Site Driveway</td> <td style="padding: 2px;">NB/SB</td> <td style="padding: 2px;">▼</td> <td colspan="2" style="padding: 2px;">Minimum Calculated ...</td> <td style="padding: 2px;"></td> </tr> <tr> <td style="padding: 2px;">Minor Street intersects from the:</td> <td style="padding: 2px;">south</td> <td style="padding: 2px;"></td> <td style="padding: 2px;">▼</td> <td style="padding: 2px;">... ISD, case B1:</td> <td style="padding: 2px; text-align: center;">200</td> <td style="padding: 2px; text-align: center;">Condition Met?</td> </tr> <tr> <td style="padding: 2px;">The minor street predominantly serves...</td> <td style="padding: 2px;">Passenger Cars</td> <td style="padding: 2px;"></td> <td style="padding: 2px;">▼</td> <td style="padding: 2px;">... ISD, case B2:</td> <td style="padding: 2px; text-align: center;">200</td> <td style="padding: 2px; text-align: center;">Yes</td> </tr> <tr> <td style="padding: 2px;">Sight distance location intersection is...</td> <td style="padding: 2px;">Existing</td> <td style="padding: 2px;"></td> <td style="padding: 2px;">▼</td> <td style="padding: 2px;">... ISD, case B3:</td> <td style="padding: 2px; text-align: center;">200</td> <td style="padding: 2px; text-align: center;">Yes</td> </tr> <tr> <td style="padding: 2px;">Total number of lanes on Major Street is...</td> <td style="padding: 2px;">2</td> <td style="padding: 2px;"></td> <td style="padding: 2px;">▼</td> <td colspan="3" style="padding: 2px;"><small>[note: minimum ISD is equal to required SSD]</small></td> </tr> <tr style="background-color: black; color: white;"> <td colspan="4" style="padding: 2px;">Grade Information [enter down slope as a negative number]</td> <td colspan="4" style="padding: 2px;">Calculated ...</td> </tr> <tr> <td style="padding: 2px;">Major Street Approach Grade:</td> <td style="padding: 2px;">0.00%</td> <td style="padding: 2px;">EB</td> <td style="padding: 2px;"></td> <td style="padding: 2px;">... 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