6-I-25-DP
TIL Version 1
4/25/2025

ARDURRA

April 25, 2025

Mr. Mike Conger, PE
Knoxville-Knox County Planning
400 Main Street, Suite 403
Knoxville, TN 37902

Re: Traffic Impact Letter for Weigel's Westland at Ebenezer

Dear Mr. Conger:

Weigel's Inc. is proposing a commercial development with a convenience store and gas station with a 6,600 SF store and sixteen (16) vehicle fueling positions. The development is located at the southeast corner of the signalized intersection of Westland Drive (north) at Ebenezer Road in Knox County Tennessee. The total area of development is approximately 1.87 acres and the property is currently zoned PC (Planned Commercial). Construction is proposed to take place this year and this analysis assumes full build out for the development will occur in 2028. A copy of the concept plan is included in the attachments.

A previous concept plan was approved for a Weigel's convenience market with gasoline pumps with a 3,997 SF store and sixteen (16) vehicle fueling positions by the Knoxville-Knox County Planning Commission on July 12, 2012.

A Level I Traffic Impact Study was conducted for the Weigel's Westland at Ebenezer Development. The "Ebenezer Road – Westland Drive Weigel's Convenience Store Traffic Impact Study" was prepared by CDM Smith and dated May 21, 2012.

The Weigel's Westland at Ebenezer was also included in "The Crescent at Ebenezer Commercial Site & Phase 2 Apartments" prepared by Fulghum, MacIndoe & Associates and dated May 19, 2021.

The purpose of this Traffic Impact Letter is to update the previous traffic studies based on the current site conditions and the revised concept plan layout for the proposed Weigel's Westland at Ebenezer.

Existing Site Conditions

Westland Drive east of the intersection of Ebenezer Road is a two-lane road. Knoxville-Knox County Planning classifies Westland Drive as a Minor Arterial with an 88 foot right-of-way per the Major Road Plan. The posted speed limit on Westland Drive is 40 mph.

Ebenezer Road is a five-lane road with a two-way left turn lane. Knoxville-Knox County Planning classifies Ebenezer Road between S Peters Road and S Northshore Drive as a Minor Arterial with a 100 foot ROW per the Major Road Plan. The posted speed limit on Ebenezer Road is 45 mph.

At the existing signalized intersection of Westland Drive (north) at Ebenezer Road the eastbound approach (Ebenezer Methodist Driveway) has a left turn lane with an approximate storage length of 30 feet, the westbound approach (Westland Drive) has a double left turn lane with an approximate storage length of 350 feet, the northbound approach (Ebenezer Road) has a left turn lane with a striped storage length of 100 feet and a right turn lane with an approximate storage length of 340 feet and the southbound approach (Ebenezer Road) has a left turn lane with a striped storage length of 140 feet.

Two full access driveway connections were installed as a part of the Crescent Commercial Development. The proposed Weigel's Gas Station and Convenience Market will have direct access to the existing driveway connection at Westland Drive (north) and to the existing driveway connection at Ebenezer Road. In addition, the Crescent Commercial Development and the proposed Weigel's Gas Station and Convenience Market have access the existing intersection of Ebenezer Road at Crescent Lake Way.

The existing driveway connection at Westland Drive (north) is located approximately 250 feet east of the signalized intersection at Ebenezer Road and has a driveway width of 36 feet. The northbound approach (driveway) has a separate left turn lane with an approximate storage length of 100 feet and a separate right turn lane with an approximate storage length of 390 feet.

The existing driveway connection at Ebenezer Road is located approximately 360 feet south of the signalized intersection of Ebenezer Road and has a driveway width of 36 feet. The eastbound approach (driveway) has separate left and right turn lanes with approximate storage length of 25 feet.

The existing sidewalk on both sides of Ebenezer Road extend northbound to the intersection of S Peters Road and southbound to the intersection with S Northshore Drive. The existing sidewalk on the south side of Westland Drive (north) extends approximately 600 feet eastbound to the intersection of Serene Breeze Way and connects to the existing Crescent Ebenezer Apartment Complex. Sidewalk ramps and crosswalk striping were installed at both driveway connections as a part of the Crescent Commercial Development.

Aerial photos of the existing intersection of Westland Drive (north) at Ebenezer Road and the existing driveway connections are included in the attachments.

Traffic Volumes

Ardurra conducted a peak hour turning movement count at the signalized intersection of Westland Drive at Ebenezer Road on Tuesday April 8, 2025. The AM peak hour occurred between 7:30 a.m. and 8:30 a.m. with a peak hour factor (PHF) of 0.95 and an hourly

volume of 3,446 vehicles and the PM peak hour occurred between 4:45 p.m. and 5:45 p.m. with a peak hour factor (PHF) of 0.97 and an hourly volume of 3,748 vehicles.

The traffic data collected is included in the attachments.

Background Growth
TDOT count station #47000286 is located on Ebenezer Road south of Nubbin Ridge Road and south of the proposed development. The annual growth rate for this station over the last ten years is approximately 1.04%. The 2024 ADT was 16,137 vehicles per day.

TPO count station ID: 093M002 is located on Westland Drive approximately 1,000 feet east of Villa Crest Drive and east of the proposed development. The annual growth rate for this station over the last ten years is approximately 2.04%. The 2023 ADT was 11,320 vehicles per day.

In order to calculate traffic for the background year 2028, Ardurra assumed an annual growth rate of 2.0%. Figure 1: 2025 Existing Peak Hour Traffic, Figure 2: 2028 Background Peak Hour Traffic, and the ADT trend line growth charts are included in the attachments.

Trip Generation
The Weigel's Gas Station and Convenience Market proposed a 6,600 Sf convenience store and a gas station with sixteen (16) vehicle fueling positions.

Convenience Store/Gas Station or Land Use 945 with a GFA (5.5-10K) was used to calculate the site trips for the proposed vehicle fueling. The site trips were calculated using the average rates from the *Trip Generation, 11th Edition,* published by the Institute of Transportation Engineers.

A pass-by trip is defined as an intermediate stop on the way from an origin to a primary trip destination without a route diversion and are trips attracted from traffic passing the site on an adjacent street or roadway that offers direct access to the generator. A *Memorandum to MPC Traffic Impact Study Reviewers and Preparers Group* was published on March 10, 1997 to document the maximum pass-by percentages for selected land uses in Knox County. A Convenience Market on a roadway with an ADT between 10,000-20,000 vehicles per day has a maximum pass-by rate of 65%; therefore, a pass-by rate of 65% was assumed for the AM and PM peak hours for the Weigel's Gas Station and Convenience Market. However, the pass-by trip reduction was capped at 10% of the adjacent street traffic during the background conditions.

The trip generation land use worksheets are included in the attachments. A trip generation summary is shown below in Table 1 – Trip Generation Summary.

Table 1 - Trip Generation Summary
Weigel's Westland & Ebenezer

Land Use	Density	Daily Trips	AM Peak Hour Enter	AM Peak Hour Exit	PM Peak Hour Enter	PM Peak Hour Exit
Convenience Store / Gas Station GFA (5.5-10K) (Land Use 945)	16 Vehicle Fueling Positions	5532	253	253	215	215
New Trips			**164**	**164**	**140**	**140**
Pass-By Trips			89	89	75	75

The new trips generated by the Weigel's Gas Station and Convenience Market were estimated to be 1,936 daily trips. The estimated new trips are 178 trips during the AM peak hour and 150 trips during the PM peak hour.

The total pass-by trips were estimated to be 3,596 daily pass-by trips, 328 trips during the AM peak hour and 280 trips during the PM peak hour.

Trip Distribution
Ebenezer Road at the existing commercial driveway connection has a trip distribution of 70% northbound and 30% southbound during the AM peak hour and 50% northbound and 50% southbound during the PM peak hour.

Westland Drive at the existing commercial driveway connection has a trip distribution of 50% eastbound and 50% westbound during the AM peak hour and 65% eastbound and 35% westbound during the PM peak hour.

The directional distribution of the trips generated by the Weigel's Gas Station and Convenience Market were determined using the existing traffic volumes at the intersection of Westland Drive at Ebenezer Road in combination with the concept plan layout. Ardurra assumed that 30% of traffic would enter and 70% of traffic would exit using the Westland Drive commercial driveway connection and 70% of traffic would enter and 30% of traffic would exit using the Ebenezer Road commercial driveway connection.

Ardurra assumed an entering/exiting trip distribution that is approximately 15% Westland Drive, 25% Ebenezer Road (north) and 60% Ebenezer Road (south) during both the AM and PM peak hours.

Figure 3: Gas Station Peak Hour Trip Distribution – New Trips, Figure 4: Gas Station Peak Hour Trip Distribution – Pass-By Trips, Figure 5: Gas Station Peak Hour New Site Trips, Figure 6: Gas Station Peak Hour Pass-By Site Trips and Figure 7: 2028 Full Buildout Peak Hour Traffic are included in the attachments.

Capacity Analysis and Level of Service

Signalized intersection capacity analyses were performed using the Synchro 11 software at the intersection of Westland Drive (north) at Ebenezer Road in order to evaluate the AM and PM peak hours for the existing, background and full buildout conditions. The existing signal timing worksheets were provided by Knox County Engineering & Public Works and are included in the attachments.

The results from the analyses are expressed with a term "level of service" (LOS), which is based on the amount of delay experienced at the intersection. The LOS index ranges from LOS A, indicating excellent traffic conditions with minimal delay, to LOS F indicating very congested conditions with excessive delay. LOS D generally is considered the minimum acceptable condition in urban areas. Table 2 shows the LOS index range for signalized and unsignalized intersections as defined by the Highway Capacity Manual (HCM).

Table 2
Level of Service (LOS) Index

Level of Service Intersection	Signalized Intersection	Unsignalized
LOS A	≤ 10 sec	≤ 10 sec
LOS B	10 – 20 sec	10 – 15 sec
LOS C	20 – 35 sec	15 – 25 sec
LOS D	35 – 55 sec	25 – 35 sec
LOS E	55 – 80 sec	35 – 50 sec
LOS F	> 80 sec	> 50 sec

The Synchro 11 worksheets are included in the attachments and the results of the capacity analysis are shown in Table 3 – Intersection Capacity Analysis Level of Service (LOS) Summary.

Table 3 - Intersection Capacity Analysis
Level of Service (LOS) Summary

Intersection	Time Period	Year 2025 Existing (Delay/LOS)	Year 2028 Background (Delay/LOS)	Year 2028 Full Buildout (Delay/LOS)
Westland Dr @	**AM Peak**			
Ebenezer Rd	EB Left	51.5 / D	51.6 / D	51.9 / D
	EB Thru/Right	51.4 / D	51.4 / D	51.8 / D
	WB Left	47.0 / D	48.1 / D	52.2 / D
	WB Thru/Right	42.5 / D	43.5 / D	43.2 / D
	NB Left	N/A	N/A	N/A
	NB Thru	24.9 / C	31.1 / C	35.7 / D
	NB Right	11.7 / B	12.1 / B	12.6 / B
	SB Left	36.2 / D	39.8 / D	44.5 / D
	SB Thru/Right	5.8 / A	6.0 / A	6.2 / A
	Intersection	**23.1 / C**	**26.5 / C**	**29.7 / C**
Westland Dr @	**PM Peak**			
Ebenezer Rd	EB Left	54.6 / D	54.9 / D	55.3 / E
	EB Thru/Right	53.6 / D	53.9 / D	54.3 / D
	WB Left	51.0 / D	52.5 / D	56.1 / E
	WB Thru/Right	39.1 / D	39.0 / D	38.8 / D
	NB Left	21.2 / C	22.4 / C	23.5 / C
	NB Thru	31.2 / C	34.8 / C	37.5 / D
	NB Right	24.0 / C	25.4 / C	26.4 / C
	SB Left	37.4 / D	52.7 / D	59.5 / E
	SB Thru/Right	13.1 / B	14.2 / B	14.6 / B
	Intersection	**27.9 / C**	**31.0 / C**	**33.4 / C**

Queue Analysis

The 95% queue length is defined as the queue length that has only a 5-percent probability of being exceeded during the analysis time period. The 95% queue length is typically used to determine the length of turning lanes in order to minimize the risk of blockage.

Table 4 presents the Synchro traffic queueing summary for the 95th percentile queue at the signalized intersection of Westland Drive at Ebenezer Road for both the AM and PM peak hour.

Table 4
Synchro Queue Summary

Intersection	Movement	Storage Capacity (ft)	Existing Conditions AM	Existing Conditions PM	Background Conditions AM	Background Conditions PM	Full Buildout Conditions AM	Full Buildout Conditions PM
Westland Dr @ Ebenezer Rd	EBL	30	6	34	6	35	6	35
	EBT	410	6	31	6	34	6	34
	WBL	350	130	241	137	257	176	298
	WBT	1,000+	102	68	129	71	129	71
	NBL	100	N/A	15	N/A	15	N/A	15
	NBT	900	795	452	878	495	896	531
	NBR	340	46	72	48	74	50	74
	SBL	140	**141**	**325**	**158**	**404**	**181**	**442**
	SBT	1,000+	131	391	141	430	143	433

Notes:
The # footnote indicates that the volume for the 95th percentile cycle exceeds capacity.
Bold indicates queue length exceeds available storage capacity.

Bold cells indicate that the queue lengths are more than the available storage. The 95th percentile queue length is defined as the queue length that has only a 5-percent probability of being exceeded during the analysis time period. The 95th percentile queue length is typically used to determine the length of turning lanes in order to minimize the risk of blockage. Synchro assumes a passenger vehicle length of 25 feet and a heavy vehicle length of 45 feet.

The existing northbound approach at the signalized intersection of Westland Drive (north) at Ebenezer Road has an available storage length of 900 feet before the queue blocks the signalized intersection of Westland Drive (south) at Ebenezer Road. The capacity analysis for the full buildout conditions shows that the 95% queue length for the northbound approach (Ebenezer Road) of 896 feet (36 vehicles) during the AM peak hour and 531 feet (22 vehicles) during the PM peak hour; therefore, the queue will back up to the signalized intersection of Westland Drive (south) at Ebenezer Road but will not block Westland Drive (south).

The existing southbound left turn lane at the signalized intersection of Westland Drive (north) at Ebenezer Road has a striped storage length of 140 feet and an available storage length of 380 feet before the queue blocks the northbound left turn lane at Linksvue Drive and 520 feet before the queue blocks the intersection at Linksvue Drive. The capacity analysis for the full buildout conditions shows that the 95% queue length for the southbound left turn lane (Ebenezer Road) of 181 feet (8 vehicles) during the AM peak hour and 442 feet (18 vehicles) during the PM peak hour; therefore, the queue will interfere with the northbound left turn lane at the intersection with Linksvue Drive during the PM peak hour but will not block the intersection.

The existing westbound double left turn lanes at the signalized intersection of Westland Drive (north) at Ebenezer Road have a storage length of 350 feet. The existing commercial driveway connection is located approximately 250 feet east of the intersection. The capacity analysis for the full buildout conditions shows that the 95% queue length for the westbound approach (Westland Drive) of 176 feet (7 vehicles) during the AM peak hour and 298 feet (12 vehicles) during the PM peak hour; therefore, the queue from the signalized intersection will block the existing commercial driveway connection during the PM peak hour.

Sight Distance
Within Knox County the minimum sight distance at an intersection (in both directions along the major street) shall be ten (10) times the posted speed limit, but in no case shall it be less than 250 feet in accordance with the "Knoxville-Knox County Subdivision Regulations" amended through June 13, 2024.

The minimum recommended intersection sight distance for Ebenezer Road is 450 feet in both directions and for Westland Drive is 400 feet in both directions.

Photos of the intersection sight distance at the intersection of existing driveway connections are included in the attachments.

Previous Traffic Studies
A level 1 traffic impact study was done for the Weigel's Westland at Ebenezer located in Knox County. The "Ebenezer Road – Westland Drive Weigel's Convenience Store Traffic Impact Study" was prepared by CDM Smith date May 21, 2012.

The proposed project was a 3,997 SF Weigel's convenience store with sixteen (16) vehicle fueling stations. A full access driveway connection was proposed from both Ebenezer Road and Westland Drive.

CDM Smith had the following recommendations:

- Minimize landscaping, using low growing vegetation, and signing at the proposed street access to ensure that safe sight distance is maintained.
- Extend the planned northbound right-turn lane on Ebenezer Road for Westland Drive approximately another 100 feet to be also used by traffic entering the Weigel's Convenience Store.
- Provide separate left and right turn lanes from the site access.
- Post STOP signs (R1-1) for exiting traffic from the site driveways.
- Intersection design should conform to the recommended standards and practices of the Tennessee Department of Transportation (TDOT), American Association of State Highway and Transportation Officials (AASHTO), the institute of Transportation Engineers (ITE) and the Knox County Department of Engineering & Public Works.

The concept plan was approved for the Weigel's convenience market with gasoline pumps by the Knoxville-Knox County Planning Commission on July 12, 2012.

A use on review was approved for the adjacent parcel, the Crescent at Ebenezer Commercial Development by Knoxville-Knox County Planning Commission on July 11, 2019.

A level 1 traffic impact study was conducted for the Crescent at Ebenezer Commercial Development located in Knox County on the parcel adjacent to the proposed Weigel's Store. "The Crescent at Ebenezer Commercial Site & Phase 2 Apartments Traffic Impact Study" was prepared by Fulghum, MacIndoe & Associates and dated May 19, 2021.

The proposed Weigel's convenience store was included in the background traffic and the trip generation was updated to the Trip Generation 10th Edition published by the Institute of Transportation Engineers. The total new trips generated by the Weigel's convenience store was estimated to be 2,495 daily trips. The estimated trips were 56 new trips during the AM peak hour and 68 new trips during the PM peak hour.

The following recommendation was provided as a part of the traffic study. "Knox County Engineering and Public Works recommended that the Ebenezer Road driveway be a right-in/right-out driveway connection." However, after reviewing the plans it was decided that the Weigel's driveway connections needed to match the approved 2012 site plan unless a written agreement from LKM Properties was provided.

Conclusion and Recommendations
The previously approved concept plan for the Weigel's Gas Station and Convenience Market had a 3,997 SF store and sixteen (16) vehicle fueling positions. The total new trips generated were estimated to be 2,495 daily trips, 56 trips during the AM peak hour and 68 trips during the PM peak hour using the *Trip Generation 10th Edition*.

The updated concept plan for the Weigel's Gas Station and Convenience Market has a 6,600 SF store and sixteen (16) vehicle fueling positions. The total new trips generated were estimated to be 1,936 daily trips, 178 trips during the AM peak hour and 150 trips during the PM peak hour using the *Trip Generation 11th Edition*. The estimated increase in daily trips from the previously approved concept plan is partially due to the increase in the convenience store building size and partially due to updating the calculations to the current *Trip Generation 11th Edition*.

After the completion of the Weigel's Gas Station and Convenience Market the signalized intersection of Westland (north) at Ebenezer Road will continue to operate at an acceptable LOS C during both the AM and PM peak hours.

The result of the queue analysis is that during the PM peak hour the southbound left turn lane (Ebenezer Road) will exceed capacity and block access to the northbound turn lane at Linksvue Drive. Also, during the PM peak hour, the queue from the signalized intersection of Westland Drive (north) at Ebenezer Road will block the existing commercial driveway connection at Westland Drive.

The PM peak hour at the signalized intersection has a high percentage of daily traffic but

during the remaining hours of the day the intersection operates effectively with no turn lanes exceeding capacity; therefore, there are no recommended improvements.

Both the driveway connection at Westland Drive and the driveway connection at Ebenezer Road were installed as recommended. There are no further recommendations as a result of the increase in building size for the Weigel's Westland at Ebenezer convenience store and gas station.

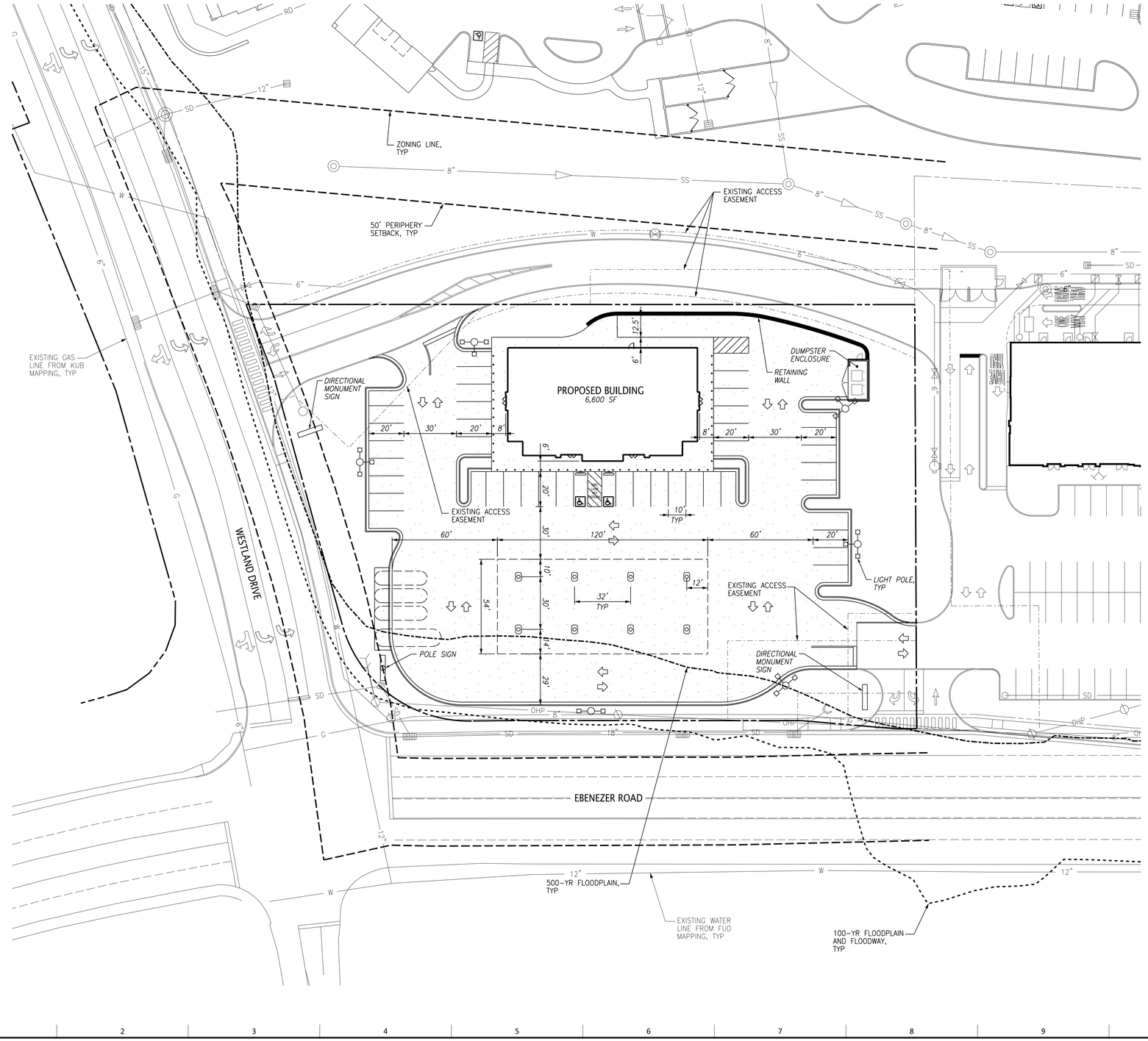
I hope that this is helpful. Please contact me if you have any questions.

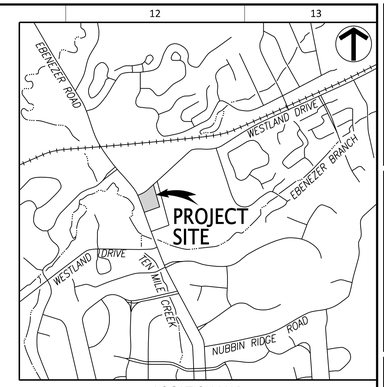
Thank you,

Addie Kirkham, P.E.

Enclosure: Attachments

Attachments





LOCATION MAP
(NOT TO SCALE)

0 30 60
SCALE: FEET

NOTES:

1. *THE BOUNDARY DATA WAS TAKEN FROM GARY C. CLARK, LLC. DATED JUNE 5, 2019.*
2. *UNLESS NOTED OTHERWISE, DIMENSIONS ARE TAKEN FROM THE FENCE LINE, PROPERTY LINE, FACE OF CURB, EDGE OF PAVEMENT OR OUTSIDE FACE OF BUILDING.*
3. *PROPERTY CONCERNED REFLECTS PARCEL 132 09904 AS SHOWN IN KNOX COUNTY CLT MAP 132. ZONING FOR THE PROPERTY IS PC, PLANNED COMMERCIAL DISTRICT. TOTAL AREA = ± 1.87 AC.*
4. *OWNER: LKM PROPERTIES, L.P. P.O. BOX 650, POWELL, TN 37849*
5. *PERIPHERAL SETBACK IS 50-FT.*
6. *REFER TO ARCHITECTURAL PLANS FOR BUILDING DIMENSIONS.*

PARKING SUMMARY:

REQUIRED PARKING FOR GASOLINE SERVICE STATION

8 EMPLOYEES @ 1 SPACE PER EMPLOYEE =	*8 SPACES*
16 SERVICE BAYS @ 2 SPACES PER BAY =	*32 SPACES*
TOTAL	*40 SPACES*

TOTAL PARKING PROVIDED

STANDARD SPACES (9'x17.5')	*42*
HANDICAP (2 VAN ACCESSIBLE)	*2*
TOTAL	*44 SPACES*

LEGEND:

- *CONCRETE PAVEMENT*
- *PROPERTY LINE*
- *PROPOSED SETBACK*
- *EASEMENT*
- *100 YEAR FLOODPLAIN/FLOODWAY*
- *500 YEAR FLOODPLAIN*

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Knoxville, TN 37922
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www.Ardurra.com

LKM PROPERTIES, L.P.
P.O. BOX 650
POWELL, TN 37849
MR. BILL WEIGEL
BILL@WEIGELS.COM
(865)-938-2042

NO.	DATE	REVISION	BY

WEIGEL'S STORE # 111
8880 WESTLAND DRIVE,
KNOXVILLE, TN 37923

CONCEPT PLAN

PRELIMINARY
NOT FOR
CONSTRUCTION

JOB NO:	571.068
DATE:	04/10/2025

C0.01

CONCEPT PLAN
04/10/2025

File Name: J:\571\571.068\03-Prod\03-Dwgs\571068c001.dgn
Plot Date: 4/10/2025

Westland at Ebenezer

Knoxville - Knox County - KUB Geographic Information System

Printed: 4/7/2025 at 1:25:13 PM

0 50 100 200

ft

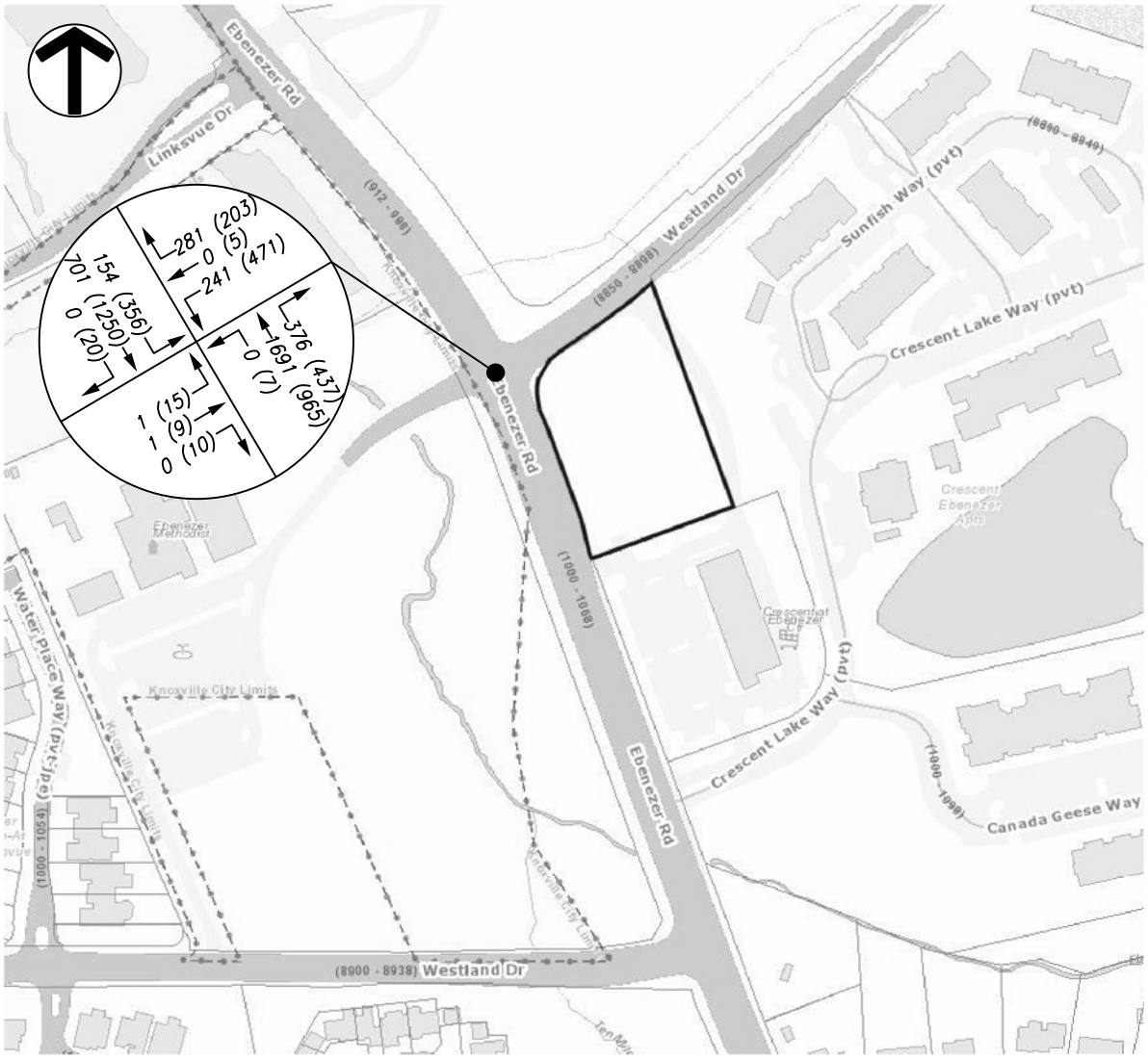
Project: 571.068 - Weigels Westland at Ebenezer
Intersection: Westland Drive at Ebenezer Road
Date Conducted: Tuesday April 8, 2025

	Ebenezer Road Southbound				Westland Drive Westbound				Ebenezer Road Northbound				Ebenezer UMC Driveway Eastbound				
Start	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Int. Total
7:00 AM	11	124	0	135	58	0	42	100	0	144	37	181	0	0	0	0	416
7:15 AM	26	120	0	146	69	0	54	123	0	259	66	325	0	0	0	0	594
7:30 AM	25	172	0	197	71	0	87	158	0	427	100	527	0	0	0	0	882
7:45 AM	36	145	0	181	57	0	82	139	0	488	84	572	1	1	0	2	894
Total	98	561	0	659	255	0	265	520	0	1318	287	1605	1	1	0	2	2786
8:00 AM	40	189	0	229	57	0	64	121	0	461	99	560	0	0	0	0	910
8:15 AM	53	195	0	248	56	0	48	104	0	315	93	408	0	0	0	0	760
8:30 AM	28	161	1	190	41	0	46	87	0	211	86	297	1	0	0	1	575
8:45 AM	22	140	3	165	60	0	50	110	0	230	59	289	1	0	0	1	565
Total	143	685	4	832	214	0	208	422	0	1217	337	1554	2	0	0	2	2810
9:00 AM	36	117	1	154	47	0	51	98	0	168	62	230	0	0	0	0	482
9:15 AM	29	112	0	141	26	1	42	69	0	157	45	202	0	0	0	0	412
9:30 AM	30	110	3	143	34	1	50	85	0	161	64	225	1	0	1	2	455
9:45 AM	34	128	2	164	51	2	49	102	2	159	38	199	0	0	0	0	465
Total	129	467	6	602	158	4	192	354	2	645	209	856	1	0	1	2	1814
10:00 AM	25	130	3	158	38	1	38	77	1	161	49	211	0	0	0	0	446
10:15 AM	26	139	1	166	52	0	29	81	0	143	46	189	0	1	0	1	437
10:30 AM	19	138	1	158	34	0	29	63	0	145	52	197	0	0	0	0	418
10:45 AM	22	110	1	133	40	0	38	78	1	140	40	181	0	0	0	0	392
Total	92	517	6	615	164	1	134	299	2	589	187	778	0	1	0	1	1693
11:00 AM	33	122	2	157	35	1	25	61	0	138	46	184	2	0	0	2	404
11:15 AM	42	144	0	186	49	0	28	77	0	155	44	199	0	0	0	0	462
11:30 AM	37	151	0	188	43	0	42	85	0	155	64	219	5	0	2	7	499
11:45 AM	46	148	0	194	48	0	47	95	0	167	35	202	4	0	2	6	497
Total	158	565	2	725	175	1	142	318	0	615	189	804	11	0	4	15	1862
12:00 PM	44	156	0	200	52	0	30	82	0	145	45	190	0	0	0	0	472
12:15 PM	39	168	0	207	44	0	33	77	0	162	36	198	0	1	1	2	484
12:30 PM	47	174	0	221	54	0	40	94	0	147	50	197	0	0	0	0	512
12:45 PM	37	188	1	226	39	0	39	78	0	183	46	229	0	0	0	0	533
Total	167	686	1	854	189	0	142	331	0	637	177	814	0	1	1	2	2001
1:00 PM	27	184	0	211	61	0	42	103	0	135	47	182	0	0	0	0	496
1:15 PM	32	182	0	214	50	0	48	98	1	152	42	195	0	0	1	1	508
1:30 PM	47	194	1	242	63	0	31	94	0	156	55	211	0	0	0	0	547
1:45 PM	53	222	2	277	52	0	41	93	0	132	51	183	0	0	0	0	553
Total	159	782	3	944	226	0	162	388	1	575	195	771	0	0	1	1	2104
2:00 PM	55	217	1	273	53	1	43	97	0	145	37	182	0	0	0	0	552
2:15 PM	52	209	1	262	68	2	37	107	0	136	43	179	0	0	0	0	548
2:30 PM	41	187	5	233	75	3	34	112	0	148	50	198	0	0	0	0	543
2:45 PM	39	190	5	234	62	4	36	102	0	205	46	251	1	1	1	3	590
Total	187	803	12	1002	258	10	150	418	0	634	176	810	1	1	1	3	2233
3:00 PM	54	188	4	246	67	4	41	112	0	203	50	253	4	4	4	12	623
3:15 PM	35	179	6	220	56	1	58	115	0	212	52	264	5	7	8	20	619
3:30 PM	67	277	5	349	83	5	44	132	0	178	57	235	2	3	8	13	729
3:45 PM	72	386	7	465	90	2	41	133	1	191	102	294	4	2	3	9	901
Total	228	1030	22	1280	296	12	184	492	1	784	261	1046	15	16	23	54	2872
4:00 PM	80	279	6	365	83	0	38	121	2	159	78	239	2	3	2	7	732
4:15 PM	61	231	5	297	90	3	45	138	0	211	89	300	4	2	2	8	743
4:30 PM	74	265	5	344	99	0	28	127	3	214	78	295	7	6	2	15	781
4:45 PM	85	265	5	355	101	1	38	140	3	260	113	376	3	4	5	12	883
Total	300	1040	21	1361	373	4	149	526	8	844	358	1210	16	15	11	42	3139
5:00 PM	96	337	2	435	135	2	45	182	3	230	110	343	2	1	1	4	964
5:15 PM	81	313	8	402	99	1	58	158	0	270	99	369	7	2	3	12	941
5:30 PM	94	335	5	434	136	1	62	199	1	205	115	321	3	2	1	6	960
5:45 PM	74	266	4	344	76	7	49	132	1	282	103	386	1	0	3	4	866
Total	345	1251	19	1615	446	11	214	671	5	987	427	1419	13	5	8	26	3731
6:00 PM	77	233	1	311	70	1	45	116	0	205	114	319	4	0	2	6	752
6:15 PM	73	224	1	298	83	0	48	131	4	208	96	308	5	0	0	5	742
6:30 PM	52	206	1	259	65	1	34	100	3	144	72	219	2	1	0	3	581
6:45 PM	51	170	1	222	53	0	38	91	0	141	61	202	0	0	1	1	516
Total	253	833	4	1090	271	2	165	438	7	698	343	1048	11	1	3	15	2591
Grand Total	2259	9220	100	11579	3025	45	2107	5177	26	9543	3146	12715	71	41	53	165	29636
Approach %	19.5	79.6	0.9		58.4	0.9	40.7		0.2	75.1	24.7		43.0	24.8	32.1		
Total %	7.6	31.1	0.3	39.1	10.2	0.2	7.1	17.5	0.1	32.2	10.6	42.9	0.2	0.1	0.2	0.6	

Project: 571.068 - Weigels Westland at Ebenezer
Intersection: Westland Drive at Ebenezer Road
Date Conducted: Tuesday April 8, 2025

AM Peak Hour	7:30 AM - 8:30 AM	3446
PM Peak Hour	4:45 PM - 5:45 PM	3748

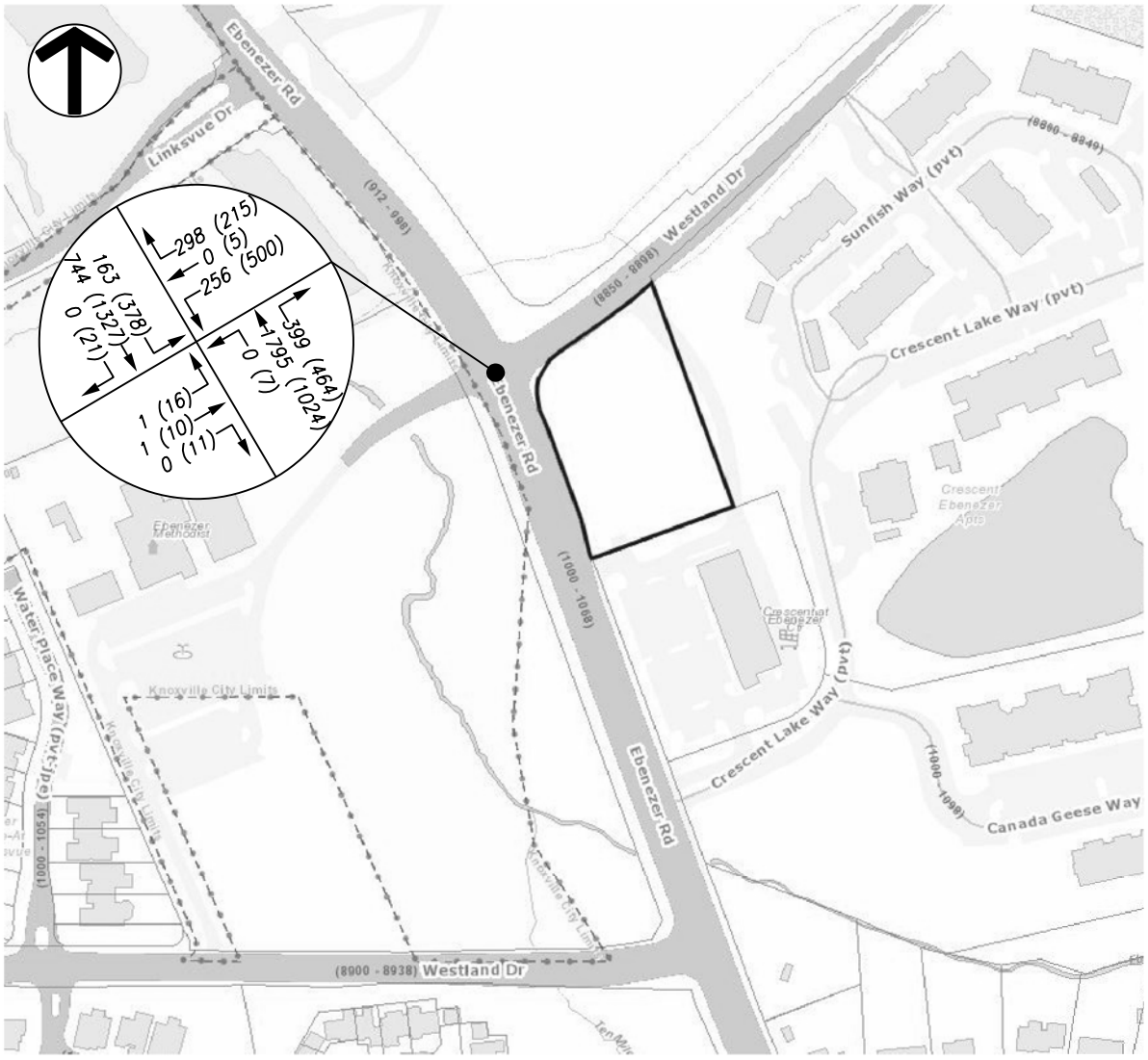
	Ebenezer Road Southbound				Westland Drive Westbound				Ebenezer Road Northbound				Ebenezer UMC Driveway Eastbound				
Start	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Int. Total
Peak Hour Analysis from 7:00 AM to 9:00 AM																	
AM Peak Hour begins at 7:30 AM																	
7:30 AM	25	172	0	197	**71**	0	**87**	158	0	427	**100**	527	0	0	0	0	882
7:45 AM	36	145	0	181	57	0	82	139	0	**488**	84	572	1	1	0	2	894
8:00 AM	40	189	0	229	57	0	64	121	0	461	99	560	0	0	0	0	**910**
8:15 AM	**53**	**195**	**0**	248	56	0	48	104	0	315	93	408	0	0	0	0	760
Total Volume	154	701	0	855	241	0	281	522	0	1691	376	2067	1	1	0	2	3446
Future (2.0% over 3 yrs)	163	744	0		256	0	298		0	1795	399		1	1	0		3657
PHF	0.73	0.90	-		0.85	-	0.81		-	0.87	0.94		0.25	0.25	-		0.95
Peak Hour Analysis from 3:00 PM to 6:00 PM																	
PM Peak Hour begins at 4:45 PM																	
4:45 PM	85	265	5	355	101	1	38	140	**3**	260	113	376	3	**4**	**5**	12	883
5:00 PM	**96**	**337**	2	435	135	**2**	45	182	3	230	110	343	2	1	1	4	**964**
5:15 PM	81	313	**8**	402	99	1	58	158	0	**270**	99	369	**7**	2	3	12	941
5:30 PM	94	335	5	434	**136**	1	**62**	199	1	205	**115**	321	3	2	1	6	960
Total Volume	356	1250	20	1626	471	5	203	679	7	965	437	1409	15	9	10	34	3748
Future (2.0% over 3 yrs)	378	1327	21		500	5	215		7	1024	464		16	10	11		3977
PHF	0.93	0.93	0.63		0.87	0.63	0.82		0.58	0.89	0.95		0.54	0.56	0.50		0.97



LEGEND:

← 5 (16) TURNING MOVEMENT VOLUME AM (PM)

Figure 1: 2025 Existing Peak Hour Traffic

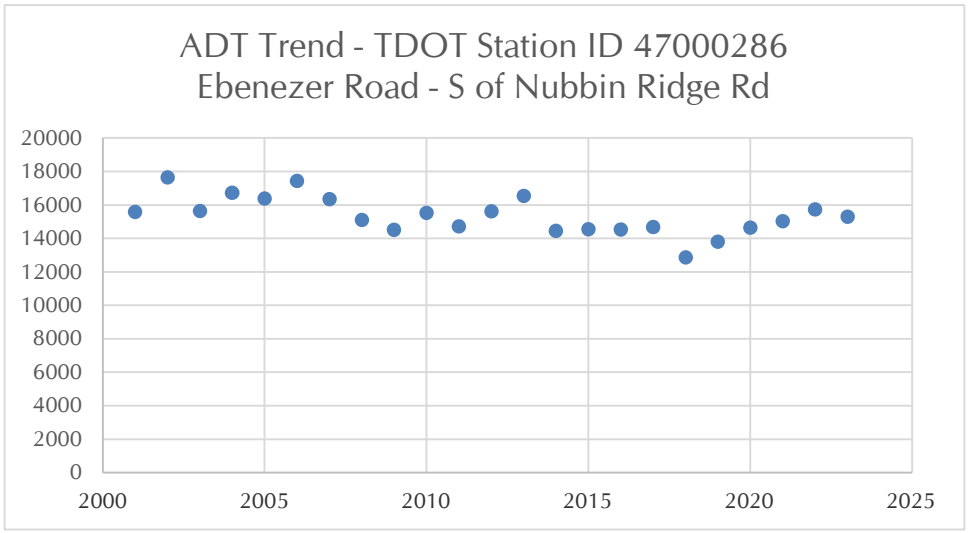


LEGEND:

← 5 (16) TURNING MOVEMENT VOLUME AM (PM)

Figure 2: 2028 Background Peak Hour Traffic

Year	Adjusted Average Daily Traffic
2001	15586
2002	17645
2003	15651
2004	16730
2005	16397
2006	17434
2007	16355
2008	15111
2009	14530
2010	15533
2011	14717
2012	15634
2013	16555
2014	14456
2015	14550
2016	14546
2017	14691
2018	12863
2019	13806
2020	14650
2021	15039
2022	15739
2023	15310
2024	16137

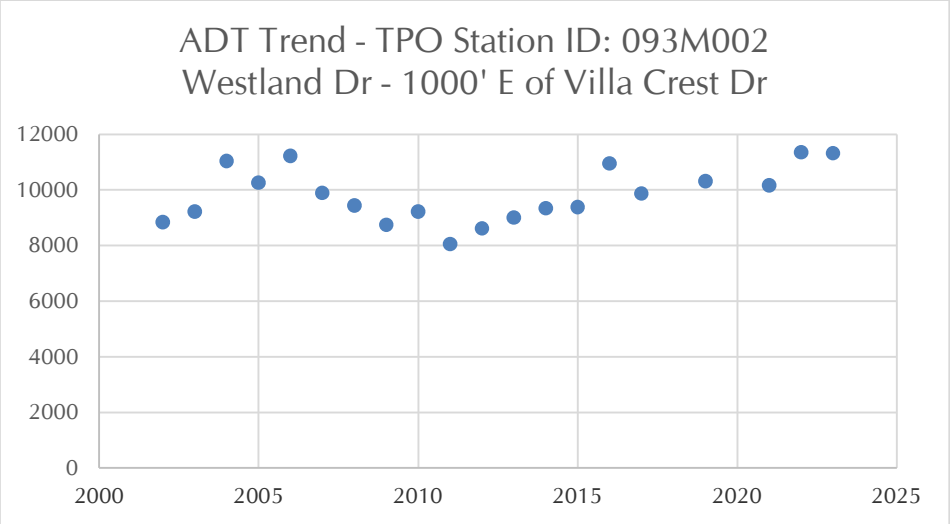


Most Recent Trend Line Growth

Year	ADT
2014	14456
2024	16137

Annual Percent Growth **1.04%**

Year	Adjusted Average Daily Traffic
2002	8850
2003	9220
2004	11040
2005	10267
2006	11230
2007	9890
2008	9440
2009	8750
2010	9220
2011	8050
2012	8620
2013	9010
2014	9340
2015	9390
2016	10950
2017	9870
2018	
2019	10320
2020	
2021	10160
2022	11360
2023	11320



Most Recent Trend Line Growth

Year	ADT
2013	9010
2023	11320

Annual Percent Growth **2.04%**

Project: Weigel's Westland & Ebenezer
Date Conducted: 4/4/2025

Convenience Store/Gas Station (LUC 945) (GFA 5.5-10k)
16 Vehicle Fueling Positions

Average Daily Traffic
Average Rate = 345.75
T = 345.75 * (16)
T = 5532

Peak Hour of Adjacent Street Traffic
One Hour Between 7 and 9 a.m.
Average Rate = 31.60
T = 31.60 * (16)
T = 506

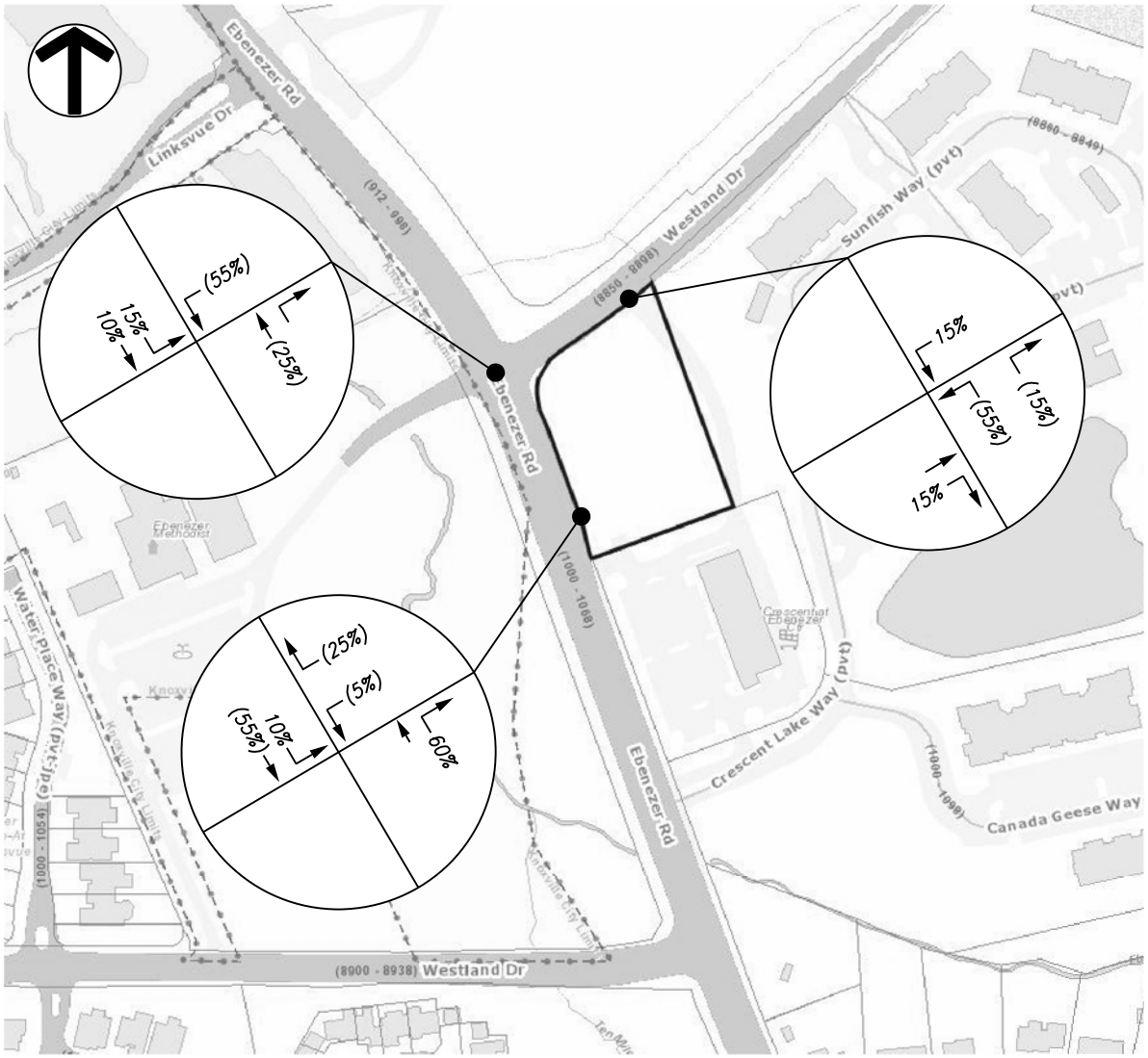
Peak Hour of Adjacent Street Traffic
One Hour Between 4 and 6 p.m.
Average Rate = 26.90
T = 26.90 * (16)
T = 430

Time Period	Total Trips	Percent		Number	
		Enter	Exit	Enter	Exit
Weekday (24 hours)	5532	50%	50%	2766	2766
AM Peak Hour	506	50%	50%	253	253
PM Peak Hour	430	50%	50%	215	215

Trip Generation							
			Daily	AM Peak Hour		PM Peak Hour	
ITE Code	Land Use	Density	Total	Enter	Exit	Enter	Exit
945	Gasoline/Service Station with Convenience Market GFA (5.5-10k)	16 fueling positions	5532	253	253	215	215
Pass-By Reduction 65%			-3596	-164	-164	-140	-140
		New Trips	**1936**	**89**	**89**	**75**	**75**

* Pass-by reduction capped at 10% of adjacent street volume

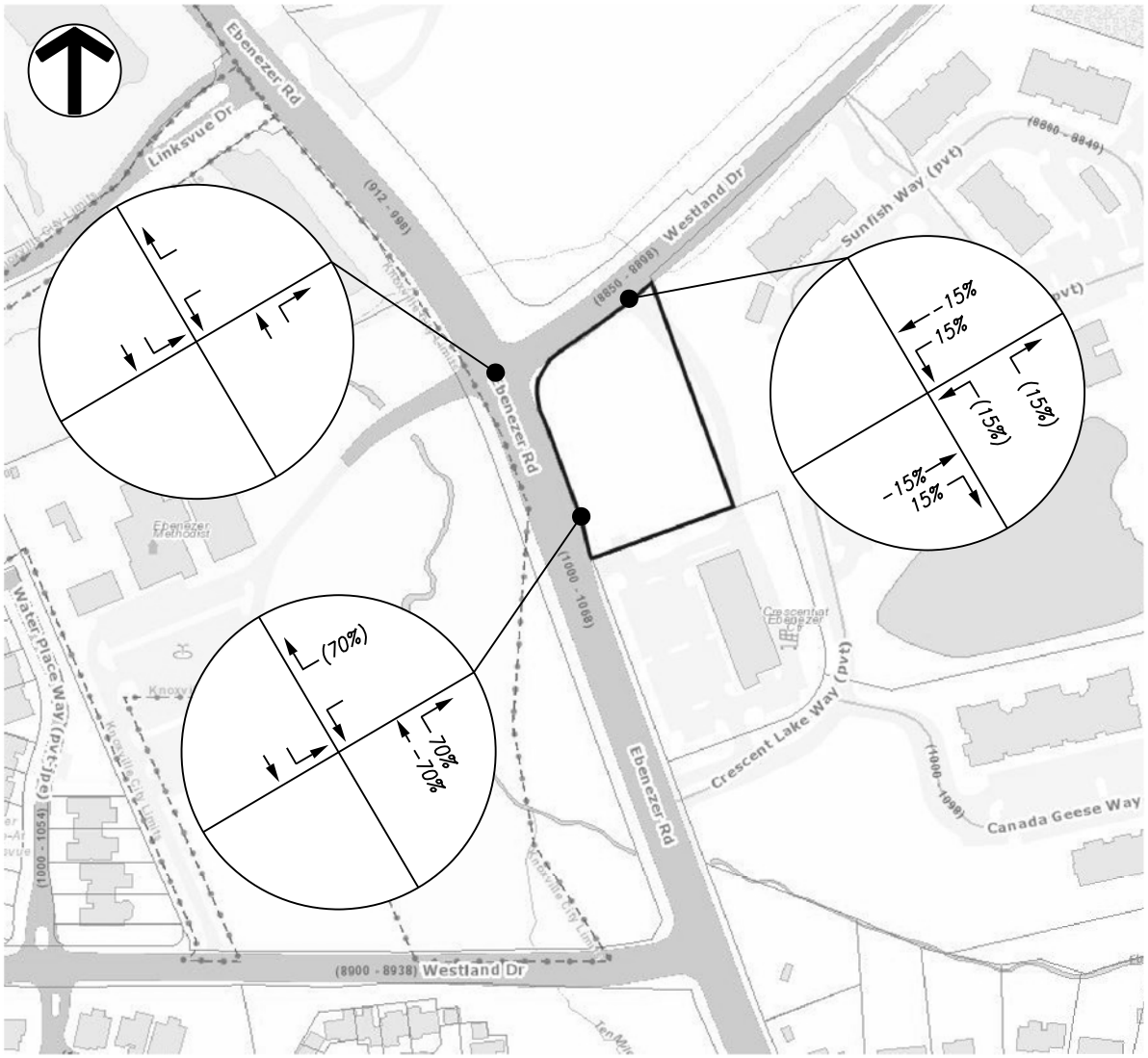
Total Pass-By Trips	3596	164	164	140	140
Total New Trips	**1936**	**89**	**89**	**75**	**75**



LEGEND:

← 50% (50%) TRIP DISTRIBUTION ENTERING (EXITING)

Figure 3: Gas Station Peak Hour Trip Distribution - New Trips



LEGEND:

← 5 (16) TURNING MOVEMENT VOLUME AM (PM)

Figure 4: Gas Station Peak Hour Trip Distribution - Pass-By Trips

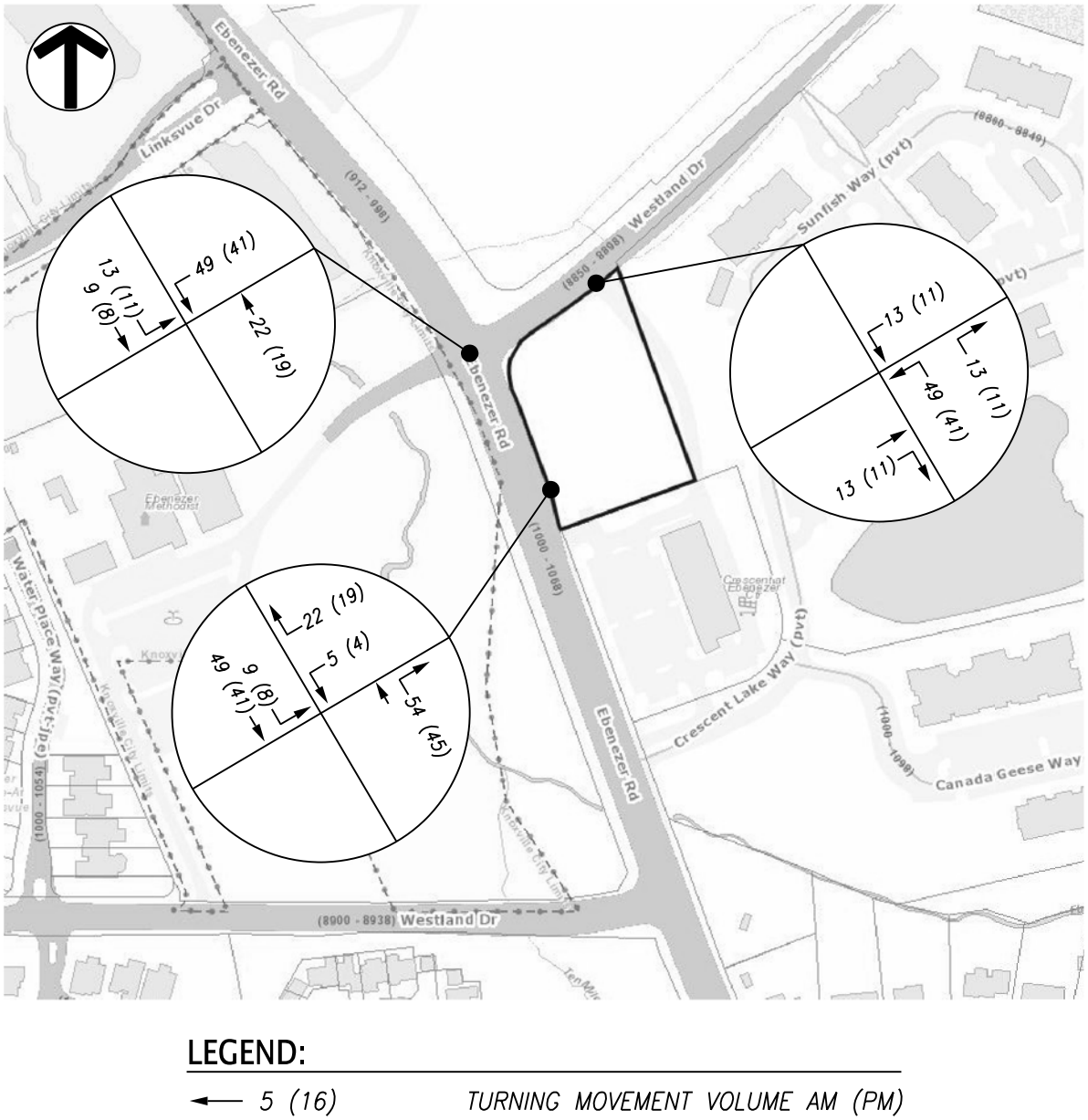


Figure 5: Gas Station Peak Hour New Site Trips

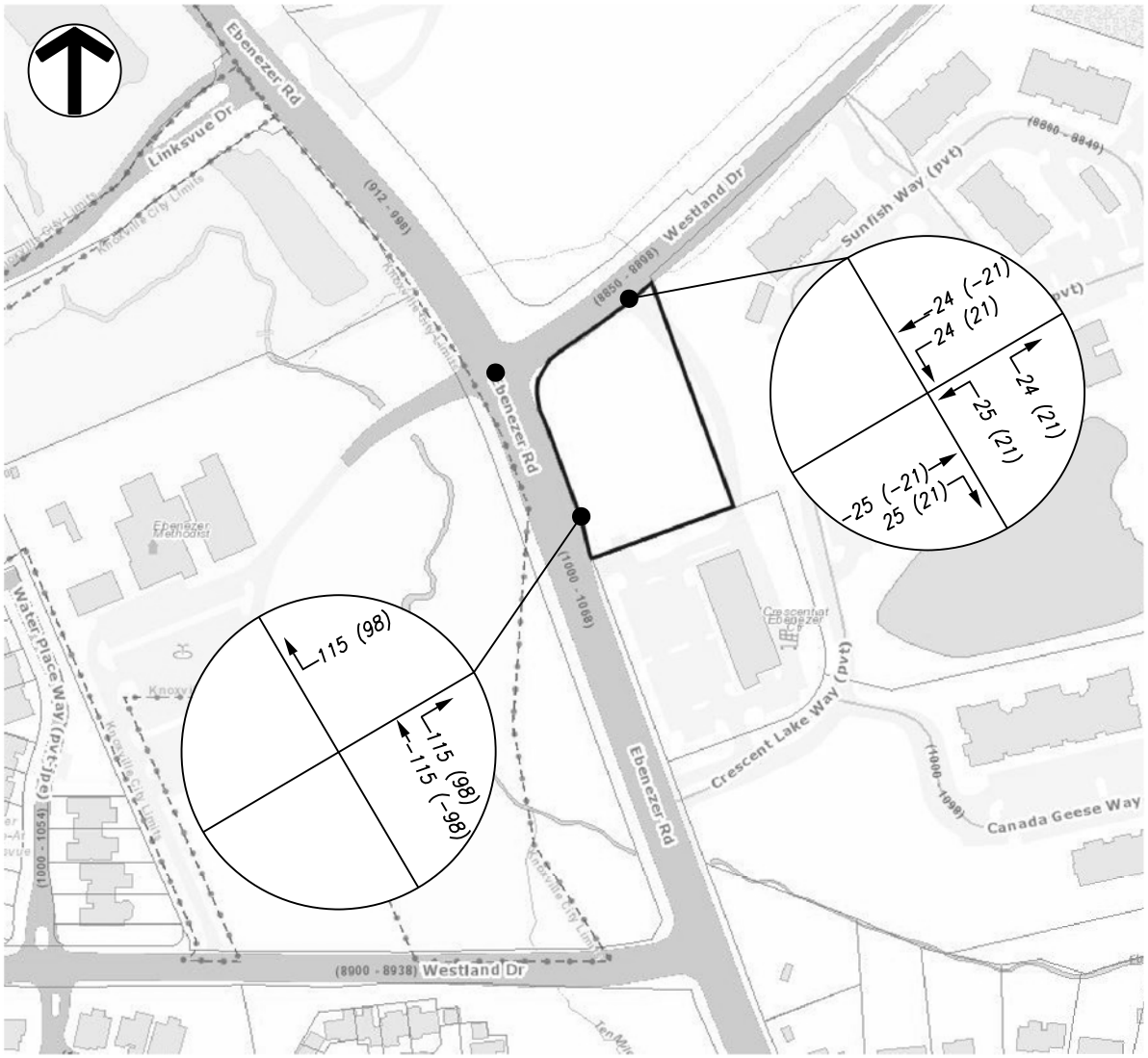
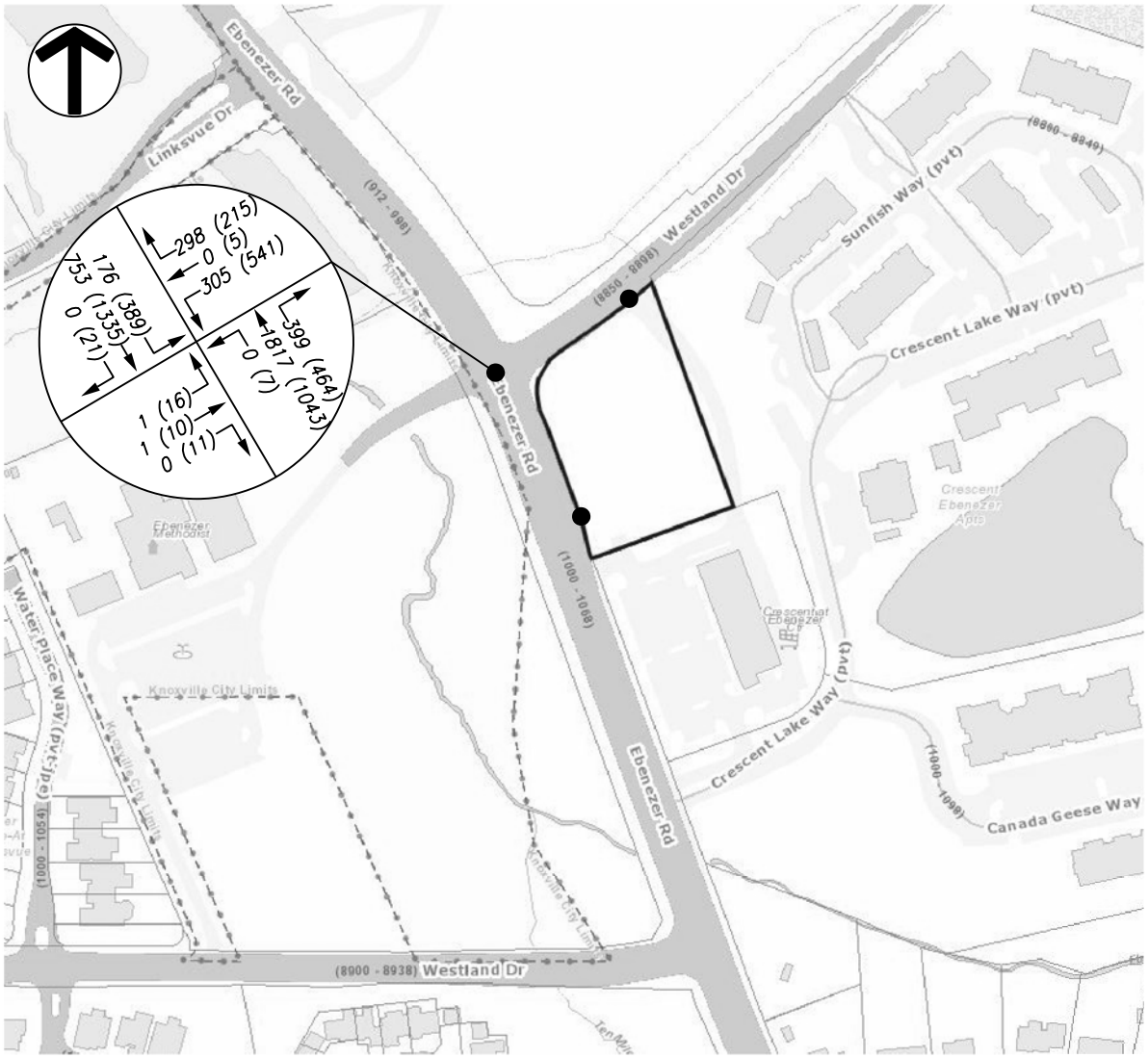


Figure 6: Gas Station Peak Hour Pass-By Site Trips



LEGEND:

← 5 (16) TURNING MOVEMENT VOLUME AM (PM)

Figure 7: 2028 Full Buildout Peak Hour Traffic

LOCAL CONTROLLER PROGRAMMING

INTERSECTION NUMBER: 19 ZONE: D

INTERSECTION: Ebenezer Road at Westland Drive (north)

INSTALLATION DATE:

PROGRAMMED BY: Timing as of 10/1/24 by ALC

NOTES:

PEEK TRAFFIC

PEEK 3000 SERIES

MASTER TYPE: ~~PEEK 3000~~ McCain

MASTER LOCATION:

TIME BY PHASE (SEC) & FUNCTIONS

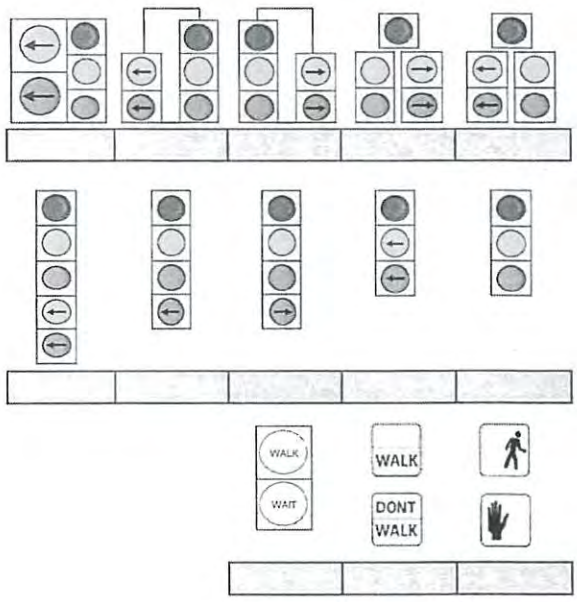
PHASE	1	2	3	4	5	6	7	8
INITIAL	6	20	6	8		20		
PASSAGE	3.0	3.0	3.0	3.0		3.0		
YELLOW	3.0	4.0	3.0	4.0		4.0		
RED CLEAR	2.0	1.5	2.5	2.0		1.5		
WALK		7	7	7		7		
PED CLEAR		21	29	22		21		
MAX 1	15	45	20	20		45		
MAX 2	12	20	20	20		20		
MAX 3 LIMIT								
MAX 3 ADJUST								
CNA 1								
CNA 2								
WALK REST MOD.								
FLASH WALK								
INHIBIT MAX								
PED RECYCLE								
MIN RECALL								
MAX RECALL								
PED RECALL								
SOFT RECALL								
NON-LOCK								
VEHICLE OMIT								
PED OMIT								
MAX OUTS TO ADJ MAX 3								
GAP OUTS TO ADJ MAX 3								

CONTROLLER OPTIONS

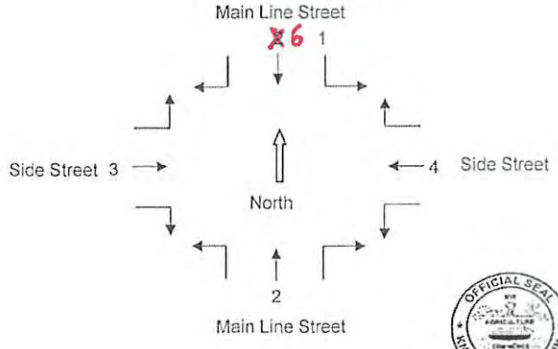
PHASE	1	2	3	4	5	6	7	8
START UP								
UCF LAST								
UCF EXIT								
SIM. GAP								

MIN RED REVERT		UCF OVERRIDE HOLD		PRE-EMPT OVERRIDES STOP TIME
RED REVERT TIME		UCF TEST A OR B		
AUTO PED CLEAR		PASSAGE SEQUENTIAL		
START UP FLASH		ENABLE SIM. GAP		
START UP INTERVAL		ENHANCED PED OPERATION		
START UP ALL RED		EXT. START OVERRIDES		
FLASH				
FREE				
SPECIAL				

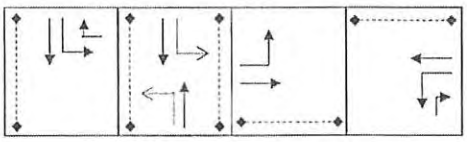
SIGNAL DISPLAYS



PHASING SCHEMATIC



PHASING SEQUENCE



KNOX COUNTY
DEPARTMENT OF ENGINEERING AND PUBLIC WORKS

INTERSECTION NUMBER: **19** ZONE: **D**

INTERSECTION: Ebenezer Road at Westland Drive (north)

INSTALLATION DATE: _____

PROGRAMMED BY: _____

NOTES: _____

DETECTOR SETTINGS

PEEK TRAFFIC
A Kapsch Company

PEEK 3000 SERIES

DETECTION DATA

PHASE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
LOOPS																
VIDEO																

DETECTOR ASSIGNMENTS

DETECTOR	1	2	3	4	5	6	7	8
DETECTOR 1	X							
DETECTOR 2		X						
DETECTOR 3			X					
DETECTOR 4				X				
DETECTOR 5					X			
DETECTOR 6						X		
DETECTOR 7							X	
DETECTOR 8								X

DETECTOR MODES & TIMING

DETECTOR	DETECTOR MODE	DELAY TIME	STRETCH/ STOP BAR
1			
2			
3			
4			
5			
6			
7			
8			

DELAY INHIBITS

PHASE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
DETECTOR 1																
DETECTOR 2																
DETECTOR 3																
DETECTOR 4																
DETECTOR 5																
DETECTOR 6																
DETECTOR 7																
DETECTOR 8																

OFFICIAL SEAL
KNOX COUNTY, TENN.

KNOX COUNTY
DEPARTMENT OF ENGINEERING AND PUBLIC WORKS

INTERSECTION NUMBER: 19 ZONE: D

INTERSECTION: Ebenezer Road at Westland Drive (north)

INSTALLATION DATE: _____

PROGRAMMED BY: _____

NOTES: Offset is referenced at beginning of yellow

COORDINATION AND OPERATION

PEEK TRAFFIC
A Q-Free Company

PEEK 3000 SERIES

Changed by ALC 10/1124

PHASE ALLOCATIONS (SEC)

PHASE	1	2	3	4	5	6	7	8
CYCLE 1/SPLIT 1	16	62	13	19	0	78	0	0
CYCLE 1/SPLIT 2								
CYCLE 2/SPLIT 1	30	46	15	29	30	46	15	29
CYCLE 2/SPLIT 2								
CYCLE 3/SPLIT 1	16	34	20	20	16	34	20	20
CYCLE 3/SPLIT 2								
CYCLE 4/SPLIT 1								
CYCLE 4/SPLIT 2								

DYNAMIC OMITS

PHASE/OVL	1/A	2/B	3/C	4/D	5/E	6/F	7/G	8/H
OMIT PHASE								
IF PHASE OR OVL ON								
OMIT PHASE								
IF PHASE OR OVL ON								
OMIT PHASE								
IF PHASE OR OVL ON								
OMIT PHASE								
IF PHASE OR OVL ON								

OPERATING MODE

FUNCTION	
AUTO PERM	
END OF MAIN ST	
ENHANCED PERM	
FIXED FORCE OFF	
YELLOW OFFSET	
CENTRAL OVERIDE	
NO PCL OFFSET ADJ	
OFFSET ENTRY IN %	
PERM-PA ENTRY IN %	
INVERT FREE IN	
SPLIT MATRIX	
4 SPLITS / CYCLE	
NO EARLY COORD PED	
CYCLE SOURCE	
SPLIT SOURCE	
OFFSET SOURCE	
FREE SOURCE	
FLASH SOURCE	
INTER. TOD REVERT	
TYPE OF PERM	
OFFSET SEEKING	
PED PERMISSIVE	
YIELD PERCENT	

CYCLE LENGTH / DWELL / OFFSETS

CYCLE	1	2	3	4	5	6
CYCLE LENGTH	110	120	90			
MAX DWELL						
OFFSET 1	21	47	40			
OFFSET 2						
OFFSET 3						
OFFSET 4						
OFFSET 5						

PHASE REVERSAL

PATTERN	MODE	PHASES	
		LEAD	LAG

DUAL ENTRY

PHASE	1	2	3	4	5	6	7	8
PHASE 1								
PHASE 2								
PHASE 3								
PHASE 4								
PHASE 5								
PHASE 6								
PHASE 7								
PHASE 8								

COORD. PHASES

CYCLE	PHASES TO BE COORD	
1	2	6
2		
3		
4		
5		
6		

CYCLE / OFFSET / SPLIT / FREE TO TOD CIRCUITS

PLAN	C / O / S / FREE				CKT	CKT	CKT	CKT
1								
2								

OFFICIAL SEAL KNOX COUNTY, TENN.

KNOX COUNTY
DEPARTMENT OF ENGINEERING AND PUBLIC WORKS

INTERSECTION NUMBER: **19** ZONE: **D**

INTERSECTION: Ebenezer Road at Westland Drive (north)

INSTALLATION DATE: _____

PROGRAMMED BY: _____

NOTES: _____

TIME OF DAY PROGRAMMING

PEEK TRAFFIC
A Siemens Company

PEEK 3000 SERIES

WEEKLY PROGRAM PLAN

PLAN	SUN 1	MON 2	TUE 3	WED 4	THU 5	FRI 6	SAT 7
1	2	1	1	1	1	1	2
2							
3							
4							
5							

DAYLIGHT SAVINGS

	MONTH	W-O-M
SPRING	3	2
FALL	11	1

CIRCUIT OVERRIDES

CKT	SYM	ON/OFF/TOD

TIME DEPENDENT SYNC REF

CYCLE	HH:MM
1	
2	
3	
4	
5	
6	
SYNC REF	

DAY PLAN EVENTS

PLAN	HH:MM	CKT PLAN	C/O/S	CKT	ON/OFF
1	00:00	FREE			
1	06:30		1/1/1		
1	09:30		3/1/1		
1	14:30		2/1/1		
1	18:00		3/1/1		
1	21:00	FREE			
2	00:00	FREE			
2	09:00		3/1/1		
2	19:00	FREE			

TOD CIRCUIT PLANS

PLAN	CKT	ON/OFF	CKT	ON/OFF	CKT	ON/OFF	CKT	ON/OFF
1								
2								
3								

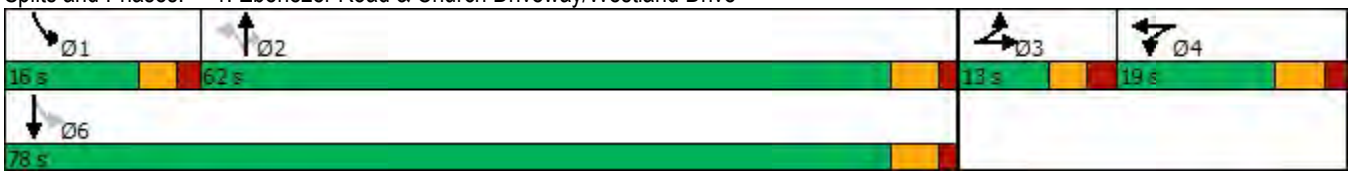
OFFICIAL SEAL KNOX COUNTY TENN.

KNOX COUNTY
DEPARTMENT OF ENGINEERING AND PUBLIC WORKS

Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	1	1	241	0	1691	376	154	701
Future Volume (vph)	1	1	241	0	1691	376	154	701
Turn Type	Split	NA	Split	NA	NA	Perm	pm+pt	NA
Protected Phases	3	3	4	4	2		1	6
Permitted Phases						2	6	
Detector Phase	3	3	4	4	2	2	1	6
Switch Phase								
Minimum Initial (s)	6.0	6.0	8.0	8.0	20.0	20.0	6.0	20.0
Minimum Split (s)	11.5	11.5	14.0	14.0	25.5	25.5	11.0	25.5
Total Split (s)	13.0	13.0	19.0	19.0	62.0	62.0	16.0	78.0
Total Split (%)	11.8%	11.8%	17.3%	17.3%	56.4%	56.4%	14.5%	70.9%
Yellow Time (s)	3.0	3.0	4.0	4.0	4.0	4.0	3.0	4.0
All-Red Time (s)	2.5	2.5	2.0	2.0	1.5	1.5	2.0	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	6.0	6.0	5.5	5.5	5.0	5.5
Lead/Lag	Lead	Lead	Lag	Lag	Lag	Lag	Lead	
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	Max	Max	None	Max
Act Effct Green (s)	6.0	6.0	11.8	11.8	58.6	58.6	73.2	72.7
Actuated g/C Ratio	0.06	0.06	0.12	0.12	0.60	0.60	0.75	0.74
v/c Ratio	0.01	0.01	0.62	0.69	0.84	0.36	0.68	0.28
Control Delay	47.0	47.0	48.5	16.0	22.3	2.3	32.5	5.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.0	47.0	48.5	16.0	22.3	2.3	32.5	5.0
LOS	D	D	D	B	C	A	C	A
Approach Delay		47.0		31.1	18.6			9.9
Approach LOS		D		C	B			A

Intersection Summary	
Cycle Length: 110	
Actuated Cycle Length: 98.1	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.84	
Intersection Signal Delay: 18.4	Intersection LOS: B
Intersection Capacity Utilization 86.4%	ICU Level of Service E
Analysis Period (min) 15	

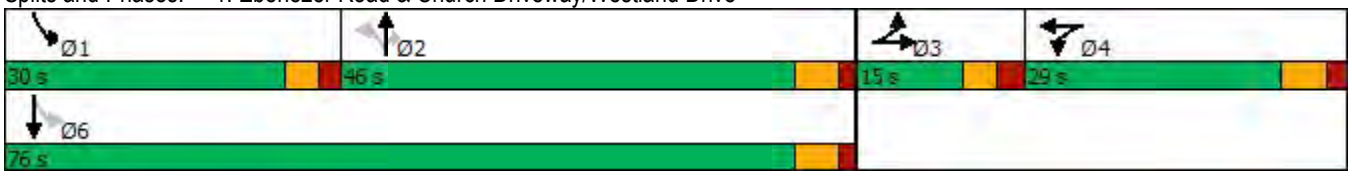
Splits and Phases: 1: Ebenezer Road & Church Driveway/Westland Drive

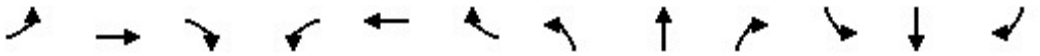


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	15	9	471	5	7	965	437	356	1250
Future Volume (vph)	15	9	471	5	7	965	437	356	1250
Turn Type	Split	NA	Split	NA	Perm	NA	Perm	pm+pt	NA
Protected Phases	3	3	4	4		2		1	6
Permitted Phases					2		2	6	
Detector Phase	3	3	4	4	2	2	2	1	6
Switch Phase									
Minimum Initial (s)	6.0	6.0	8.0	8.0	20.0	20.0	20.0	6.0	20.0
Minimum Split (s)	29.0	29.0	22.0	22.0	25.5	25.5	25.5	11.0	25.5
Total Split (s)	15.0	15.0	29.0	29.0	46.0	46.0	46.0	30.0	76.0
Total Split (%)	12.5%	12.5%	24.2%	24.2%	38.3%	38.3%	38.3%	25.0%	63.3%
Yellow Time (s)	3.0	3.0	4.0	4.0	4.0	4.0	4.0	3.0	4.0
All-Red Time (s)	2.5	2.5	2.0	2.0	1.5	1.5	1.5	2.0	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	6.0	6.0	5.5	5.5	5.5	5.0	5.5
Lead/Lag	Lead	Lead	Lag	Lag	Lag	Lag	Lag	Lead	
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	Max	Max	Max	None	Max
Act Effct Green (s)	6.8	6.8	20.1	20.1	44.7	44.7	44.7	71.6	71.1
Actuated g/C Ratio	0.06	0.06	0.18	0.18	0.41	0.41	0.41	0.65	0.65
v/c Ratio	0.14	0.17	0.78	0.46	0.04	0.69	0.50	0.81	0.57
Control Delay	55.1	38.4	52.6	9.6	27.4	32.9	4.7	36.3	13.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.1	38.4	52.6	9.6	27.4	32.9	4.7	36.3	13.6
LOS	E	D	D	A	C	C	A	D	B
Approach Delay		45.8		39.5		24.1			18.5
Approach LOS		D		D		C			B

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 109.9	
Natural Cycle: 110	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.81	
Intersection Signal Delay: 24.7	Intersection LOS: C
Intersection Capacity Utilization 86.1%	ICU Level of Service E
Analysis Period (min) 15	

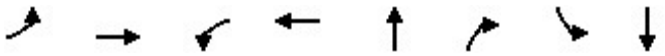
Splits and Phases: 1: Ebenezer Road & Church Driveway/Westland Drive





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	1	0	241	0	281	0	1691	376	154	701	0
Future Volume (vph)	1	1	0	241	0	281	0	1691	376	154	701	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		5%			0%			0%			0%	
Total Lost time (s)	5.5	5.5		6.0	6.0			5.5	5.5	5.0	5.5	
Lane Util. Factor	1.00	1.00		0.97	1.00			0.95	1.00	1.00	0.95	
Frt	1.00	1.00		1.00	0.85			1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1725	1816		3433	1583			3539	1583	1770	3539	
Flt Permitted	0.95	1.00		0.95	1.00			1.00	1.00	0.06	1.00	
Satd. Flow (perm)	1725	1816		3433	1583			3539	1583	117	3539	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1	1	0	254	0	296	0	1780	396	162	738	0
RTOR Reduction (vph)	0	0	0	0	242	0	0	0	170	0	0	0
Lane Group Flow (vph)	1	1	0	254	54	0	0	1780	226	162	738	0
Turn Type	Split	NA		Split	NA		Perm	NA	Perm	pm+pt	NA	
Protected Phases	3	3		4	4			2		1	6	
Permitted Phases							2		2	6		
Actuated Green, G (s)	1.1	1.1		11.8	11.8			58.6	58.6	72.7	72.7	
Effective Green, g (s)	1.1	1.1		11.8	11.8			58.6	58.6	72.7	72.7	
Actuated g/C Ratio	0.01	0.01		0.12	0.12			0.57	0.57	0.71	0.71	
Clearance Time (s)	5.5	5.5		6.0	6.0			5.5	5.5	5.0	5.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	18	19		394	182			2021	904	229	2507	
v/s Ratio Prot	c0.00	0.00		c0.07	0.03			c0.50		c0.06	0.21	
v/s Ratio Perm									0.14	0.44		
v/c Ratio	0.06	0.05		0.64	0.29			0.88	0.25	0.71	0.29	
Uniform Delay, d1	50.2	50.2		43.4	41.6			19.0	11.0	26.6	5.5	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.3	1.2		3.6	0.9			5.9	0.7	9.6	0.3	
Delay (s)	51.5	51.4		47.0	42.5			24.9	11.7	36.2	5.8	
Level of Service	D	D		D	D			C	B	D	A	
Approach Delay (s)		51.5			44.6			22.5			11.3	
Approach LOS		D			D			C			B	

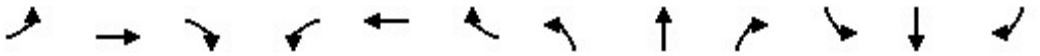
Intersection Summary			
HCM 2000 Control Delay	23.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	102.6	Sum of lost time (s)	22.0
Intersection Capacity Utilization	86.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	1	1	254	296	1780	396	162	738
v/c Ratio	0.01	0.01	0.62	0.69	0.84	0.36	0.68	0.28
Control Delay	47.0	47.0	48.5	16.0	22.3	2.3	32.5	5.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.0	47.0	48.5	16.0	22.3	2.3	32.5	5.0
Queue Length 50th (ft)	1	1	76	12	434	0	44	63
Queue Length 95th (ft)	6	6	130	102	#795	46	#141	131
Internal Link Dist (ft)		368		596	520			479
Turn Bay Length (ft)	30		350			340	140	
Base Capacity (vph)	132	139	456	447	2114	1105	273	2622
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	0.01	0.01	0.56	0.66	0.84	0.36	0.59	0.28

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	9	10	471	5	203	7	965	437	356	1250	20
Future Volume (vph)	15	9	10	471	5	203	7	965	437	356	1250	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		5%			0%			0%			0%	
Total Lost time (s)	5.5	5.5		6.0	6.0		5.5	5.5	5.5	5.0	5.5	
Lane Util. Factor	1.00	1.00		0.97	1.00		1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.92		1.00	0.85		1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1725	1673		3433	1590		1770	3539	1583	1770	3531	
Flt Permitted	0.95	1.00		0.95	1.00		0.21	1.00	1.00	0.13	1.00	
Satd. Flow (perm)	1725	1673		3433	1590		391	3539	1583	244	3531	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	15	9	10	486	5	209	7	995	451	367	1289	21
RTOR Reduction (vph)	0	10	0	0	172	0	0	0	271	0	1	0
Lane Group Flow (vph)	15	9	0	486	42	0	7	995	180	367	1309	0
Turn Type	Split	NA		Split	NA		Perm	NA	Perm	pm+pt	NA	
Protected Phases	3	3		4	4			2		1	6	
Permitted Phases							2		2	6		
Actuated Green, G (s)	4.1	4.1		20.1	20.1		44.8	44.8	44.8	71.1	71.1	
Effective Green, g (s)	4.1	4.1		20.1	20.1		44.8	44.8	44.8	71.1	71.1	
Actuated g/C Ratio	0.04	0.04		0.18	0.18		0.40	0.40	0.40	0.63	0.63	
Clearance Time (s)	5.5	5.5		6.0	6.0		5.5	5.5	5.5	5.0	5.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	62	61		614	284		155	1411	631	443	2235	
v/s Ratio Prot	c0.01	0.01		c0.14	0.03			0.28		c0.16	0.37	
v/s Ratio Perm							0.02		0.11	c0.37		
v/c Ratio	0.24	0.15		0.79	0.15		0.05	0.71	0.29	0.83	0.59	
Uniform Delay, d1	52.6	52.4		44.1	38.9		20.7	28.2	22.9	25.3	12.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.0	1.2		6.9	0.2		0.5	3.0	1.1	12.1	1.1	
Delay (s)	54.6	53.6		51.0	39.1		21.2	31.2	24.0	37.4	13.1	
Level of Service	D	D		D	D		C	C	C	D	B	
Approach Delay (s)		54.0			47.4			28.9			18.5	
Approach LOS		D			D			C			B	

Intersection Summary			
HCM 2000 Control Delay	27.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	112.3	Sum of lost time (s)	22.0
Intersection Capacity Utilization	86.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

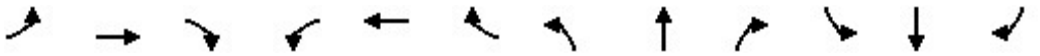
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	15	19	486	214	7	995	451	367	1310
v/c Ratio	0.14	0.17	0.78	0.46	0.04	0.69	0.50	0.81	0.57
Control Delay	55.1	38.4	52.6	9.6	27.4	32.9	4.7	36.3	13.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.1	38.4	52.6	9.6	27.4	32.9	4.7	36.3	13.6
Queue Length 50th (ft)	11	7	177	3	3	353	0	176	302
Queue Length 95th (ft)	34	31	241	68	15	452	72	#325	391
Internal Link Dist (ft)		368		596		520			479
Turn Bay Length (ft)	30		350		100		340	140	
Base Capacity (vph)	150	154	724	500	159	1439	911	508	2284
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.12	0.67	0.43	0.04	0.69	0.50	0.72	0.57

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

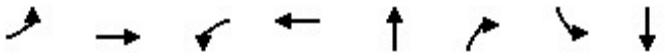
HCM Signalized Intersection Capacity Analysis
1: Ebenezer Road & Church Driveway/Westland Drive

04/16/2025



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	1	0	256	0	298	0	1795	399	163	744	0
Future Volume (vph)	1	1	0	256	0	298	0	1795	399	163	744	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		5%			0%			0%			0%	
Total Lost time (s)	5.5	5.5		6.0	6.0			5.5	5.5	5.0	5.5	
Lane Util. Factor	1.00	1.00		0.97	1.00			0.95	1.00	1.00	0.95	
Frt	1.00	1.00		1.00	0.85			1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1725	1816		3433	1583			3539	1583	1770	3539	
Flt Permitted	0.95	1.00		0.95	1.00			1.00	1.00	0.06	1.00	
Satd. Flow (perm)	1725	1816		3433	1583			3539	1583	118	3539	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1	1	0	269	0	314	0	1889	420	172	783	0
RTOR Reduction (vph)	0	0	0	0	240	0	0	0	180	0	0	0
Lane Group Flow (vph)	1	1	0	269	74	0	0	1889	240	172	783	0
Turn Type	Split	NA		Split	NA		Perm	NA	Perm	pm+pt	NA	
Protected Phases	3	3		4	4			2		1	6	
Permitted Phases							2		2	6		
Actuated Green, G (s)	1.1	1.1		11.9	11.9			58.2	58.2	72.7	72.7	
Effective Green, g (s)	1.1	1.1		11.9	11.9			58.2	58.2	72.7	72.7	
Actuated g/C Ratio	0.01	0.01		0.12	0.12			0.57	0.57	0.71	0.71	
Clearance Time (s)	5.5	5.5		6.0	6.0			5.5	5.5	5.0	5.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	18	19		397	183			2005	897	236	2505	
v/s Ratio Prot	c0.00	0.00		c0.08	0.05			c0.53		c0.07	0.22	
v/s Ratio Perm									0.15	0.45		
v/c Ratio	0.06	0.05		0.68	0.40			0.94	0.27	0.73	0.31	
Uniform Delay, d1	50.3	50.3		43.6	42.1			20.7	11.4	29.1	5.6	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.3	1.2		4.5	1.4			10.4	0.7	10.7	0.3	
Delay (s)	51.6	51.4		48.1	43.5			31.1	12.1	39.8	6.0	
Level of Service	D	D		D	D			C	B	D	A	
Approach Delay (s)		51.5			45.6			27.7			12.0	
Approach LOS		D			D			C			B	

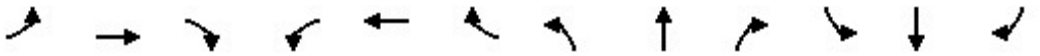
Intersection Summary			
HCM 2000 Control Delay	26.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	102.7	Sum of lost time (s)	22.0
Intersection Capacity Utilization	90.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	1	1	269	314	1889	420	172	783
v/c Ratio	0.01	0.01	0.65	0.73	0.90	0.38	0.70	0.30
Control Delay	47.0	47.0	49.4	19.3	26.2	2.4	34.9	5.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.0	47.0	49.4	19.3	26.2	2.4	34.9	5.1
Queue Length 50th (ft)	1	1	81	23	503	1	50	67
Queue Length 95th (ft)	6	6	137	#129	#878	48	#158	141
Internal Link Dist (ft)		368		596	520			479
Turn Bay Length (ft)	30		350			340	140	
Base Capacity (vph)	132	138	455	445	2096	1107	272	2618
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	0.01	0.01	0.59	0.71	0.90	0.38	0.63	0.30

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	10	11	500	5	215	7	1024	464	378	1327	21
Future Volume (vph)	16	10	11	500	5	215	7	1024	464	378	1327	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		5%			0%			0%			0%	
Total Lost time (s)	5.5	5.5		6.0	6.0		5.5	5.5	5.5	5.0	5.5	
Lane Util. Factor	1.00	1.00		0.97	1.00		1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.92		1.00	0.85		1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1725	1673		3433	1589		1770	3539	1583	1770	3531	
Flt Permitted	0.95	1.00		0.95	1.00		0.19	1.00	1.00	0.10	1.00	
Satd. Flow (perm)	1725	1673		3433	1589		361	3539	1583	187	3531	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	16	10	11	515	5	222	7	1056	478	390	1368	22
RTOR Reduction (vph)	0	11	0	0	181	0	0	0	294	0	1	0
Lane Group Flow (vph)	16	10	0	515	46	0	7	1056	184	390	1389	0
Turn Type	Split	NA		Split	NA		Perm	NA	Perm	pm+pt	NA	
Protected Phases	3	3		4	4			2		1	6	
Permitted Phases							2		2	6		
Actuated Green, G (s)	4.2	4.2		20.7	20.7		43.5	43.5	43.5	71.0	71.0	
Effective Green, g (s)	4.2	4.2		20.7	20.7		43.5	43.5	43.5	71.0	71.0	
Actuated g/C Ratio	0.04	0.04		0.18	0.18		0.39	0.39	0.39	0.63	0.63	
Clearance Time (s)	5.5	5.5		6.0	6.0		5.5	5.5	5.5	5.0	5.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	64	62		629	291		139	1363	609	433	2220	
v/s Ratio Prot	c0.01	0.01		c0.15	0.03			0.30		c0.18	0.39	
v/s Ratio Perm							0.02		0.12	c0.39		
v/c Ratio	0.25	0.17		0.82	0.16		0.05	0.77	0.30	0.90	0.63	
Uniform Delay, d1	52.8	52.7		44.3	38.8		21.8	30.4	24.1	31.3	12.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.1	1.3		8.2	0.3		0.7	4.4	1.3	21.4	1.3	
Delay (s)	54.9	53.9		52.5	39.0		22.4	34.8	25.4	52.7	14.2	
Level of Service	D	D		D	D		C	C	C	D	B	
Approach Delay (s)		54.3			48.4			31.8			22.6	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	31.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	112.9	Sum of lost time (s)	22.0
Intersection Capacity Utilization	89.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Queues
1: Ebenezer Road & Church Driveway/Westland Drive

04/16/2025

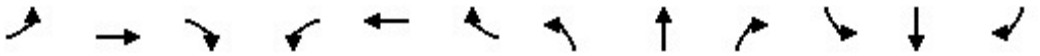
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	16	21	515	227	7	1056	478	390	1390
v/c Ratio	0.15	0.19	0.80	0.48	0.05	0.76	0.52	0.88	0.61
Control Delay	55.4	37.9	54.1	9.4	27.7	35.7	4.8	49.5	14.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.4	37.9	54.1	9.4	27.7	35.7	4.8	49.5	14.5
Queue Length 50th (ft)	12	7	190	3	4	387	0	222	339
Queue Length 95th (ft)	35	34	257	71	15	#495	74	#404	430
Internal Link Dist (ft)		368		596		520			479
Turn Bay Length (ft)	30		350		100		340	140	
Base Capacity (vph)	149	154	719	508	141	1392	912	482	2270
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.14	0.72	0.45	0.05	0.76	0.52	0.81	0.61

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis
1: Ebenezer Road & Church Driveway/Westland Drive

04/16/2025



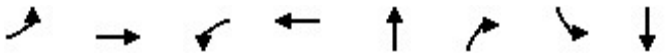
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	1	0	305	0	298	0	1817	399	176	753	0
Future Volume (vph)	1	1	0	305	0	298	0	1817	399	176	753	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		5%			0%			0%			0%	
Total Lost time (s)	5.5	5.5		6.0	6.0			5.5	5.5	5.0	5.5	
Lane Util. Factor	1.00	1.00		0.97	1.00			0.95	1.00	1.00	0.95	
Frt	1.00	1.00		1.00	0.85			1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1725	1816		3433	1583			3539	1583	1770	3539	
Flt Permitted	0.95	1.00		0.95	1.00			1.00	1.00	0.06	1.00	
Satd. Flow (perm)	1725	1816		3433	1583			3539	1583	119	3539	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1	1	0	321	0	314	0	1913	420	185	793	0
RTOR Reduction (vph)	0	0	0	0	239	0	0	0	181	0	0	0
Lane Group Flow (vph)	1	1	0	321	75	0	0	1913	239	185	793	0
Turn Type	Split	NA		Split	NA		Perm	NA	Perm	pm+pt	NA	
Protected Phases	3	3		4	4			2		1	6	
Permitted Phases							2		2	6		
Actuated Green, G (s)	1.1	1.1		12.6	12.6			57.8	57.8	72.7	72.7	
Effective Green, g (s)	1.1	1.1		12.6	12.6			57.8	57.8	72.7	72.7	
Actuated g/C Ratio	0.01	0.01		0.12	0.12			0.56	0.56	0.70	0.70	
Clearance Time (s)	5.5	5.5		6.0	6.0			5.5	5.5	5.0	5.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	18	19		418	192			1978	884	241	2488	
v/s Ratio Prot	c0.00	0.00		c0.09	0.05			c0.54		c0.07	0.22	
v/s Ratio Perm									0.15	0.47		
v/c Ratio	0.06	0.05		0.77	0.39			0.97	0.27	0.77	0.32	
Uniform Delay, d1	50.6	50.6		44.0	41.9			21.9	11.8	30.9	5.9	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.3	1.2		8.2	1.3			13.8	0.8	13.6	0.3	
Delay (s)	51.9	51.8		52.2	43.2			35.7	12.6	44.5	6.2	
Level of Service	D	D		D	D			D	B	D	A	
Approach Delay (s)		51.9			47.8			31.6			13.5	
Approach LOS		D			D			C			B	

Intersection Summary			
HCM 2000 Control Delay	29.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	103.4	Sum of lost time (s)	22.0
Intersection Capacity Utilization	92.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Queues

1: Ebenezer Road & Church Driveway/Westland Drive

04/16/2025



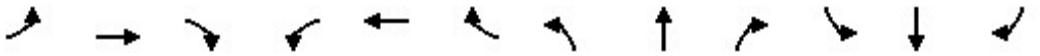
Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	1	1	321	314	1913	420	185	793
v/c Ratio	0.01	0.01	0.73	0.72	0.93	0.38	0.73	0.30
Control Delay	47.0	47.0	53.0	18.6	28.8	2.5	38.0	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.0	47.0	53.0	18.6	28.8	2.5	38.0	5.3
Queue Length 50th (ft)	1	1	98	23	526	2	58	68
Queue Length 95th (ft)	6	6	#176	#129	#896	50	#181	143
Internal Link Dist (ft)		368		596	520			479
Turn Bay Length (ft)	30		350			340	140	
Base Capacity (vph)	131	138	452	444	2068	1095	271	2600
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	0.01	0.01	0.71	0.71	0.93	0.38	0.68	0.30

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis
1: Ebenezer Road & Church Driveway/Westland Drive

04/16/2025



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	10	11	541	5	215	7	1043	464	389	1335	21
Future Volume (vph)	16	10	11	541	5	215	7	1043	464	389	1335	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		5%			0%			0%			0%	
Total Lost time (s)	5.5	5.5		6.0	6.0		5.5	5.5	5.5	5.0	5.5	
Lane Util. Factor	1.00	1.00		0.97	1.00		1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.92		1.00	0.85		1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1725	1673		3433	1589		1770	3539	1583	1770	3531	
Flt Permitted	0.95	1.00		0.95	1.00		0.19	1.00	1.00	0.09	1.00	
Satd. Flow (perm)	1725	1673		3433	1589		358	3539	1583	160	3531	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	16	10	11	558	5	222	7	1075	478	401	1376	22
RTOR Reduction (vph)	0	11	0	0	180	0	0	0	299	0	1	0
Lane Group Flow (vph)	16	10	0	558	47	0	7	1075	179	401	1397	0
Turn Type	Split	NA		Split	NA		Perm	NA	Perm	pm+pt	NA	
Protected Phases	3	3		4	4			2		1	6	
Permitted Phases							2		2	6		
Actuated Green, G (s)	4.2	4.2		21.4	21.4		42.4	42.4	42.4	70.9	70.9	
Effective Green, g (s)	4.2	4.2		21.4	21.4		42.4	42.4	42.4	70.9	70.9	
Actuated g/C Ratio	0.04	0.04		0.19	0.19		0.37	0.37	0.37	0.62	0.62	
Clearance Time (s)	5.5	5.5		6.0	6.0		5.5	5.5	5.5	5.0	5.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	63	61		647	299		133	1322	591	433	2205	
v/s Ratio Prot	c0.01	0.01		c0.16	0.03			0.30		c0.19	0.40	
v/s Ratio Perm							0.02		0.11	c0.39		
v/c Ratio	0.25	0.17		0.86	0.16		0.05	0.81	0.30	0.93	0.63	
Uniform Delay, d1	53.1	53.0		44.6	38.5		22.7	32.0	25.1	33.8	13.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.1	1.3		11.4	0.2		0.8	5.6	1.3	25.6	1.4	
Delay (s)	55.3	54.3		56.1	38.8		23.5	37.5	26.4	59.5	14.6	
Level of Service	E	D		E	D		C	D	C	E	B	
Approach Delay (s)		54.7			51.0			34.1			24.6	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	33.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	113.5	Sum of lost time (s)	22.0
Intersection Capacity Utilization	90.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	16	21	558	227	7	1075	478	401	1398
v/c Ratio	0.15	0.19	0.85	0.47	0.05	0.80	0.53	0.91	0.62
Control Delay	55.4	38.0	56.8	9.3	27.7	37.8	4.9	56.2	14.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.4	38.0	56.8	9.3	27.7	37.8	4.9	56.2	14.8
Queue Length 50th (ft)	12	7	209	3	4	397	0	244	342
Queue Length 95th (ft)	35	34	#298	71	15	#531	74	#442	433
Internal Link Dist (ft)		368		596		520			479
Turn Bay Length (ft)	30		350		100		340	140	
Base Capacity (vph)	148	153	714	506	136	1350	899	467	2253
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.14	0.78	0.45	0.05	0.80	0.53	0.86	0.62

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Ebenezer Road at Driveway – Looking Right (Northbound)

Ebenezer Road at Driveway – Looking Left (Southbound)

Westland Drive at Driveway – Looking Right (Eastbound)

Westland Drive at Driveway – Looking Left (Westbound)