Colchester School District
New Early Education School
Traffic Impact Assessment

Introduction

The Colchester School District is performing a feasibility analysis for a new early education school building (the "Project") located on the north side of Laker Lane in Colchester. The proposed building will have a capacity of 620 students, and will consolidate the existing Porters Point and Union Memorial Elementary Schools into one location.

This traffic impact assessment (TIA) examines existing and future traffic congestion and safety conditions on the adjacent highway network in the vicinity of this Project, and analyzes the probable impacts that this Project will have on those conditions.

Background (No-Build) Traffic Volumes

The geographic scope of this TIA includes three intersections along Blakely Road in Colchester:

- West Lakeshore Drive/East Lakeshore Drive/Blakely Road (aka Bayside);
- Blakely Road/Laker Lane, and;
- Blakely Road/Malletts Bay Avenue.

Background traffic volumes on Blakely Road in the immediate vicinity of this Project were obtained from several sources. The first was an automatic traffic recorder count performed by the Vermont Agency of Transportation (VTrans) on Blakely Road between Bayside and Laker Lane. Automatic traffic recorder counts (ATR) are typically week-long counts performed using rubber tubes stretched across the roadway. This particular count location, identified by VTrans as ATR D453, was most recently performed in 2016 during the last week of August. The last two days of the count coincided with the first two days of the school year. On those days, daily traffic volumes on Blakely Road averaged 12,504 vehicles per day, with peak hour volumes (both morning and afternoon) exceeding 1,100 vehicles per hour (vph). The highest hourly volume, 1,341 vph, occurred between 5-6 pm on a Thursday afternoon.

Because previous turning movement counts at the above three intersections were all performed during the summer school vacation months, this office performed new morning (7-9 am) and afternoon (2-3:30 pm and 4-6 pm) peak period turning movement counts at each intersection.

Copies of the above counts are enclosed in **Appendix A**.

Accepted engineering practice is to use design hour volumes (DHV) to analyze the capacity of intersection and roadways. The DHV is defined as being the 30th highest hour of traffic occurring annually. In Colchester, the DHV typically occurs on a weekday during the late afternoon (4:30-5:30 pm) pm peak hour.

This requires adjusting observed traffic count data to match calculated DHV's for a roadway or intersection. In Colchester, we would typically use hourly traffic data from VTrans' Continuous Count Station (CTC) D040 located on Route 7 in Sunny Hollow to calculate a DHV adjustment factor. Unfortunately, however, CTC D040 has been off-line during September 2018 and again during most of September 2019. Thus, we have elected to use the highest hourly volume from ATR D453 on Blakely Road as the baseline DHV for the year 2019.[1] Doing so resulted in a DHV adjustment factor of +10%.

Additional background traffic growth factors of +1% from 2019 to 2020 (the base year for this TIA) and +3% from 2019 to 2025 (five-year projection from 2020) were also applied.[1]

Figures 1 and 2 show the projected 2020 and 2025 "No-Build" peak hour volumes. The late afternoon pm peak hour volumes in those figures are DHV's. The morning and mid-afternoon peak hour volumes are not DHV's, but have been similarly adjusted to reflect an above average traffic day in which the DHV occurs.

Examining other nearby CTC count data, notably from CTC D002 on Route 127 in Burlington and from CTC D530 on Route 289 in Essex, indicates that pm peak hour traffic volumes on Thursday, September 12, 2019, the day of the pm peak period turning movement counts, was within 1% of the 2018 DHV at both locations. This indicates that the +10% DHV adjustment factor used in the following peak hour traffic projections is conservative, and would more than compensate for an additional five-years of background traffic growth (i.e. from 2025 to 2030).

Project-Generated Trips

Estimates of the peak hour trips that will be generated by this Project are typically calculated using published trip generation rates[2] for elementary schools (ITE Land Use Category #520). For this TIA, peak hour trip generation counts were performed at both Porters Point (PPS) and Union Memorial (UMS) elementary schools, which presently have a total student population of 500± students. These counts provide trip generation rates that are reflective of existing local conditions. Table 1 compares the observed peak hour trip generation rates with ITE rates.

Table 1 - Peak Hour Trip Generation Rates

	AM Peak Hour	Mid-Afternoon PM Peak Hour	Late-Afternoon PM Peak Hour
Observed Vehicle Trip Ends per Hour per Student	0.70	0.49	0.21
ITE Vehicle Trip Ends per Hour per Student	0.67	0.34	0.17

With Table 1 showing higher local trip generation rates than ITE elementary school trip generation rates during all three time periods, the peak hour trip generation of the new EE School was estimated using

[1] *Continuous Traffic Counter Report*, Vermont Agency of Transportation, February 2019

[2] *Trip Generation*, Institute of Transportation Engineers, 10th Edition

local trip generation rates and a capacity of 620 students. The resulting estimated vehicle trip ends (vte) are shown in Table 2.

Table 2 - New EE School Peak Hour Trips (vte/hr)

	AM Peak Hour	Mid-Afternoon PM Peak Hour	Late-Afternoon PM Peak Hour
Enter	256	143	50
Exit	178	161	56
Total	434	304	106

The directional distributions of peak hour EE School-generated trips were estimated using student residence data. Each existing elementary school presently has 250± students. The dividing line between their respective geographic areas roughly runs along Williams Road and then I-89 south to the town line. Figure 3 presents the estimated directional patterns of new school peak hour trips within the study area of this TIA.

The resulting 2020 and 2025 "Build" peak hour volumes are shown in Figures 4 and 5.

Traffic Congestion

Levels of service (LOS) at intersections are determined by average delay; measured in seconds per vehicle. The methodology for analyzing LOS is established by the *Highway Capacity Manual* (*HCM*)[3]. Table 3 summarizes the delay thresholds for LOS at intersections.

Table 3 - Intersection Level of Service Delay Thresholds

	Avg. Delay (sec/veh)	
LOS	Unsignalized	Signalized
A	≤10	≤10
B	≤15	≤20
C	≤25	≤35
D	≤35	≤55
E	≤50	≤80
F	>50	>80

The higher delay thresholds for signalized intersections reflect that motorists generally tolerate longer delays at signalized intersections than at unsignalized (stop-sign controlled) intersections.

In Vermont, LOS C represents the desired design standard for roadways and signalized intersections[4]. At two-way stop controlled (unsignalized) intersections having greater than 100 vph approach volume on a single-lane side street approach or greater than 150 vph approach volume on a two-lane side street

[3] *Highway Capacity Manual*, Transportation Research Board, 2010

[4] Vermont Agency of Transportation Highway Design "Level of Service" Policy, May 31, 2007

approach, the VTrans level of service policy establishes LOS D as the desired design standard on the minor street approach(s). There is no level of service standard for unsignalized intersections not meeting the above side street volume thresholds. Reduced levels of service are acceptable in densely settled areas where volume/capacity ratios remain below 1.0 and/or the improvements required to achieve LOS C would create adverse environmental and cultural impacts. Transportation demand management (TDM) strategies can also be used to help mitigate levels of service not meeting the foregoing standards.

For the purpose of this TIA, intersection capacity analyses were performed at each intersection. Signal timings and cycle lengths at the Bayside intersection were optimized for the 2025 Build analyses and held constant in the remaining analysis scenarios. Additionally, geometric conditions at the Blakely Road/Laker Lane intersection incorporate the proposed geometric improvements which will be constructed by the Town of Colchester in 2020. All analyses were performed using *Highway Capacity Manual* procedures and *Synchro v.10* software.

The results of the analyses, including level of service ratings, average delays and volume to capacity (V/C) ratios, are presented in Tables 4-6 on the following pages. Maximum queue lengths are discussed separately. This Project's impact on existing and future traffic congestion conditions can be seen by comparing the No-Build and Build results for a given peak hour and year. Detailed analysis reports for each intersection are also enclosed in **Appendices B-D**.

The results of the analyses indicate the following:

- The Blakely Road/Lakeshore Drive intersection at Bayside will continue to operate at acceptable levels of service with the new EE School. Our observations of traffic flow at this intersection are that westbound traffic on the Blakely Road approach often backs up a considerable distance (i.e. beyond Laker Lane) during the pm peak hour. Laker Lane is approx. 1,000 ft west of Bayside. In comparison, the calculated 95% max. queue length on the westbound approach in the 2020 No-Build PM Peak Hour analysis equals 768 ft. It appears that the excessive westbound queueing is being caused by outdated signal timings together with the westbound signal phase often being dropped due to larger than normal gaps between vehicles.
- Both the Laker Lane and Malletts Bay Avenue intersections will experience poor levels of service during peak hours regardless of whether the new EE School is constructed or not.
- Volume warrants[5] for signalizing the Laker Lane intersection were examined using the total of 2019 observed hourly volumes[6] plus new EE School trips. Hourly distributions of new EE School Trips were obtained from *Trip Generation*[2]. The results of this warrant examination indicate that both Warrant #2: Four-Hour Volume and Warrant #3: Peak Hour Volume will be satisfied with the additional traffic generated by the new EE School. A copy of the signal warrant analysis is enclosed as **Appendix E**.
- Additional intersection capacity analyses were performed to determine future levels of service at the Laker Lane intersection with signalization. The results of those analyses, which are presented in Table 7, indicate that signalization would improve future 2025 Build overall intersection levels of service to "B" during the morning and mid-afternoon peak hours, and "A" during the late-afternoon peak hour.

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5 *Manual on Uniform Traffic Control Devices*, FHWA, 2009

6 Signal warrants are based on average weekday volumes instead of design hour volumes.

- Although the Malletts Bay Avenue approach of its intersection with Blakely Road will experience level of service "F" during future late-afternoon pm peak hour conditions, the volume/capacity ratio on that approach will remain below 1.0.
- Future traffic volumes at the Blakely Road/Malletts Bay Avenue intersection appear to satisfy the peak hour warrant for signalization, but not the four-hour volume warrant. Additionally, an alternate route (Lavigne Road) exists for motorists who wish to avoid the congestion on the Malletts Bay Avenue approach.
- Ultimately, construction of a roundabout at the Blakely Road/Malletts Bay Avenue intersection would provide additional capacity, improve future levels of service and improve future safety conditions. A roundabout would likely require some additional right-of-way from school property on the north side of Blakely Road.

Table 4 – Blakely Road/Lakeshore Drive (Bayside)
Intersection Capacity Analyses Results

Approach	No-Build			Build			No-Build			Build		
	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C
	2020 AM Peak Hour						**2025 AM Peak Hour**					
W Lakeshore EB L	C	33.2	0.43	C	34.0	0.45	C	33.7	0.45	C	34.4	0.43
W Lakeshore EB T/R	B	14.5	0.56	B	16.8	0.65	B	14.8	0.57	B	17.1	0.56
Blakely Rd WB L	-	-	-	-	-	-	-	-	-	-	-	-
Blakely Rd WB T/R	C	23.2	0.60	C	26.9	0.71	C	23.4	0.60	C	27.4	0.60
Bayside NB L/T/R	C	21.0	0.00	C	21.0	0.00	C	21.0	0.00	C	21.0	0.00
E Lakeshore L/T	C	25.8	0.41	C	26.9	0.47	C	26.0	0.42	C	26.9	0.41
E Lakeshore T/R	A	2.9	0.37	A	2.8	0.37	A	2.9	0.38	A	2.8	0.37
Overall	**B**	**17.0**		**B**	**19.4**		**B**	**17.2**		**B**	**19.7**	
	2020 Mid-Afternoon Peak Hour						**2025 Mid-Afternoon Peak Hour**					
W Lakeshore EB L	C	26.1	0.44	C	34.4	0.57	C	26.7	0.46	D	35.2	0.59
W Lakeshore EB T/R	A	4.4	0.24	A	5.6	0.29	A	4.5	0.25	A	5.6	0.30
Blakely Rd WB L	B	12.8	0.01	B	14.8	0.01	B	12.8	0.01	B	15.0	0.01
Blakely Rd WB T/R	B	18.2	0.64	B	19.5	0.63	B	18.2	0.64	B	19.6	0.64
Bayside NB L/T/R	C	25.5	0.04	C	29.1	0.07	C	25.8	0.04	C	29.0	0.07
E Lakeshore L/T	C	28.1	0.07	C	32.5	0.17	C	28.3	0.07	C	32.6	0.17
E Lakeshore T/R	A	4.0	0.30	A	3.9	0.32	A	4.1	0.31	A	4.0	0.33
Overall	**B**	**13.8**		**B**	**16.0**		**B**	**13.9**		**B**	**16.1**	
	2020 PM Peak Hour						**2025 PM Peak Hour**					
W Lakeshore EB L	D	45.9	0.73	D	48.8	0.77	D	48.2	0.77	D	49.8	0.78
W Lakeshore EB T/R	A	7.2	0.40	A	7.6	0.42	A	7.3	0.41	A	7.7	0.42
Blakely Rd WB L	B	19.2	0.02	B	19.5	0.02	B	19.1	0.02	B	19.4	0.02
Blakely Rd WB T/R	C	29.6	0.76	C	30.4	0.77	C	29.6	0.76	C	31.2	0.79
Bayside NB L/T/R	A	0.4	0.06	A	0.4	0.06	A	0.4	0.06	A	0.4	0.06
E Lakeshore L/T	D	48.7	0.40	D	49.8	0.44	D	49.2	0.41	D	49.9	0.44
E Lakeshore T/R	A	3.4	0.41	A	3.4	0.42	A	3.5	0.43	A	3.4	0.43
Overall	**C**	**21.8**		**C**	**22.7**		**C**	**22.2**		**C**	**23.2**	

Table 5 - Blakely Road/Laker Lane
Intersection Capacity Analyses Results

Approach	No-Build			Build			No-Build			Build		
	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C
	2020 AM Peak Hour						**2025 AM Peak Hour**					
Laker Ln NB L/R	E	42.8	0.70	F	612.1	2.22	E	45.8	0.72	F	650.3	2.30
Blakely Rd WB L	A	9.7	0.19	B	10.6	0.33	A	9.7	0.19	B	10.7	0.33
	2020 Mid-Afternoon Peak Hour						**2025 Mid-Afternoon Peak Hour**					
Laker Ln NB L/R	C	20.2	0.45	F	83.3	1.00	C	20.7	0.46	F	91.6	1.03
Blakely Rd WB L	A	8.2	0.04	A	8.4	0.10	A	98.2	0.04	A	8.5	0.10
	2020 PM Peak Hour						**2025 PM Peak Hour**					
Laker Ln NB L/R	D	29.2	0.45	F	57.5	0.78	D	30.5	0.46	F	62.9	0.80
Blakely Rd WB L	A	8.8	0.05	A	8.9	0.08	A	8.8	0.05	A	9.0	0.08

Table 6 - Blakely Road/Malletts Bay Avenue
Intersection Capacity Analyses Results

Approach	No-Build			Build			No-Build			Build		
	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C
	2020 AM Peak Hour						**2025 AM Peak Hour**					
Malletts Bay Ave NB L/R	D	28.5	0.42	E	48.6	0.62	D	30.1	0.44	F	53.2	0.65
Blakely Rd WB L	A	9.1	0.00	A	9.4	0.00	A	9.1	0.00	A	9.4	0.00
	2020 Mid-Afternoon Peak Hour						**2025 Mid-Afternoon Peak Hour**					
Malletts Bay Ave NB L/R	C	20.7	0.37	D	27.5	0.47	C	21.3	0.38	D	28.8	0.49
Blakely Rd WB L	A	8.4	0.01	A	8.7	0.01	A	8.4	0.01	A	8.7	0.01
	2020 PM Peak Hour						**2025 PM Peak Hour**					
Malletts Bay Ave NB L/R	F	51.3	0.73	F	66.2	0.81	F	56.6	0.77	F	74.6	0.85
Blakely Rd WB L	A	8.6	0.01	A	8.7	0.01	A	8.6	0.01	A	8.7	0.01

Table 7 – Blakely Road/Lakeshore Drive (Bayside) and Blakely Road/Laker Lane Intersection Capacity Analyses Results with Traffic Signal at Laker Lane

Intersection/ Approach	2025 Build								
	AM Peak Hour			Mid-Afternoon Peak Hour			PM Peak Hour		
	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C
Bayside									
W Lakeshore EB L	D	48.0	0.55	D	46.4	0.63	D	51.1	0.73
W Lakeshore EB T/R	B	15.3	0.63	A	5.4	0.30	A	7.5	0.41
Blakely Rd WB L	-	-	-	B	14.0	0.01	B	19.4	0.02
Blakely Rd WB T/R	B	18.3	0.56	B	18.2	0.58	C	29.4	0.76
Bayside NB L/T/R	C	28.0	0.01	D	38.2	0.10	A	0.4	0.06
E Lakeshore L/T	D	45.5	0.63	D	50.4	0.30	E	61.5	0.51
E Lakeshore T/R	A	3.4	0.40	A	3.9	0.33	A	3.3	0.42
Overall	**B**	**18.9**		**B**	**17.6**		**C**	**23.1**	
Laker Lane									
Blakely Rd EB T	C	20.2	0.68	B	14.6	0.39	B	13.2	0.55
Blakely Rd EB R	A	0.8	0.25	A	0.2	0.06	A	0.4	0.07
Blakely Rd WB L	B	14.6	0.67	A	7.5	0.19	A	4.2	0.14
Blakely Rd WB T	A	6.5	0.29	A	8.9	0.37	A	6.8	0.52
Laker Ln NB L/R	D	42.7	0.84	D	40.9	0.78	B	15.1	0.50
Overall	**B**	**17.9**		**B**	**17.7**		**A**	**9.6**	

The Blakely Road/Lakeshore Drive intersection at Bayside is included again in Table 7 due to it becoming part of an interconnected coordinated system with the new traffic signal at Laker Lane. The optimal signal timings and cycle lengths in a coordinated system are often different than for an individual uncoordinated intersection; therefore, the different results shown in Table 7 compared to Table 4.

Traffic Safety

The posted speed limit on Blakely Road is 35 mph. Additionally, there is an existing school speed zone bracketing Laker Lane and the nearby schools which reduces the speed limit to 25 mph at the beginning and end of the school day during the school year.

The horizontal and vertical alignments of Blakey Road and its intersecting roadways (Lakeshore Drive, Laker Lane and Malletts Bay Avenue) are very good (no sharp curves or steep grades). Intersection sight distances well in excess of the recommended 390 ft[7] exist at all driveway and street intersections in the vicinity of the Project. Blakely Road also has paved shoulders, sidewalks and shared use paths in various locations along its length to accommodate and provide safe conditions for bicyclists and pedestrians.

[7] Geometric Design of Highways and Streets, American Association of State Highway and Transportation Officials, 2018

VTrans regularly examines five-year crash statistics to identify two types of high crash locations (HCL): highway sections (in running 0.3-mile-long segments) and intersections. The most recent HCL report[8] was examined; with the only HCL being identified being the Blakely Road/Lakeshore Drive intersection, where 26 crashes occurred over the 2012-2016 five-year period. In comparison, the Blakely Road/Laker Lane and Blakely Road/Malletts Bay Avenue intersections only experienced 6 and 3 crashes, respectively, over the same five-year period. Table 8 summarizes the crash history of the Blakely Road/ Lakeshore Drive intersection.

Table 8 - 2012-2016 Blakely Road/Lakeshore Drive Crash History

Crash Type	Year					Totals
	2012	2013	2014	2015	2016	
Rear End	13	3	-	2	1	19
Thru Moves Broadside	-	1	-	1	-	2
L/T Angle Broadside	-	-	-	-	-	0
Same Direction Sideswipe	-	-	-	1	2	3
Single Vehicle	1	-	-	-	-	1
Other	-	1	-	-	-	1
Totals	14	5	0	4	3	26

Of the 26 crashes shown in Table 8, only 3 crashes resulted in injuries (1 injury each). The crash history does not indicate any particular existing hazards or unsafe conditions. Instead, it appears that the high number of rear-end crashes in 2012 is primary cause of this intersection being an HCL. Examining VTrans' on-line Crash Query Tool for 2017 and 2018 shows only 3 crashes at this location over that more recent two-year period. Thus, the number of crashes in 2012 appears to have been an anomaly, and this intersection would no longer be classified as an HCL.

Transportation Impact Fees

There are several State highway improvement projects in Colchester for which State Act 145 transportation impact fees would apply. These fees are based on trips generated during the late afternoon (4:30-5:30 pm) pm peak hour time period. They include:

- Chimney Corners: The planned future project at this intersection has an impact fee of $891 per pm peak hour trip. The new EE School will not add pm peak hour trips traveling through this intersection.
- US 7Bay Road/Creek Farm Road: The recent state improvement project at this intersection has an impact fee of $813 per pm peak hour trip. Changes in future traffic volumes at this location associated with the new EE School can be reasonably expected to be a wash (no impact).
- I-89 Exit 16: The planned future project at this interchange has an impact fee of $1,170 per pm peak hour trip. The new EE School will not add pm peak hour trips traveling through this intersection.
- West Lakeshore Drive/Prim Road: The planned future project at this intersection has an impact fee of $692 per pm peak hour trip. Existing trips to/from PPS from east of this intersection will be removed, but trips to/from PPS from west of this intersection will be added. Thus, it appears that

[8] *High Crash Location Report: Sections and Intersections 2012-2016*, Vermont Agency of Transportation, August 2017

the new EE School will likely cause a small increase in pm peak hour trips traveling through this intersection.

Conclusions & Recommendations

From the foregoing analyses, we have formed the following conclusions and recommendations regarding the potential traffic congestion and safety impacts of this Project:

- The Blakely Road/Laker Lane intersection lacks adequate capacity, under stop-sign control, to accommodate the proposed new EE School.
- The additional traffic generated by the new EE School will warrant the installation of a traffic signal at the Blakely Road/Laker Lane intersection. This signal will provide the needed additional capacity to provide acceptable traffic congestion and safety conditions at this intersection.
- The new EE School will also necessitate signal timing adjustments at the Blakely Road/Lakeshore Drive/Bayside intersection. With the Town considering replacing this intersection with a roundabout, that may ultimately prove to be unnecessary.
- The Blakely Road/Malletts Bay will experience long delays and poor levels of service, regardless of whether the new EE School is constructed. Modifying this intersection to be a roundabout would be a better improvement to provide the additional capacity needed at this location.

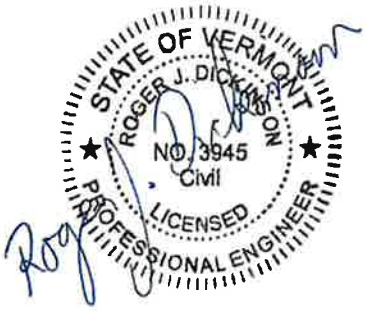
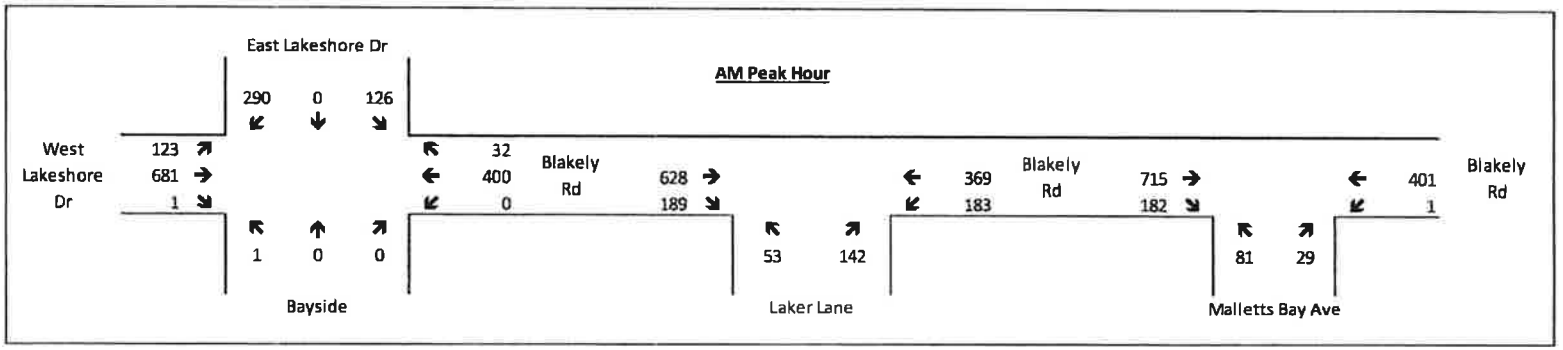
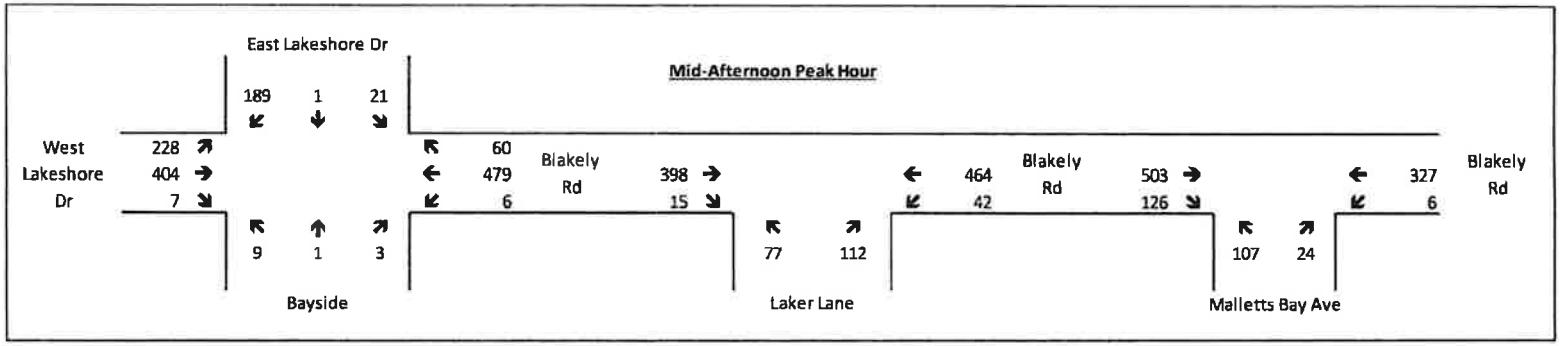


Figure 1 - 2020 No-Build Peak Hour Volumes





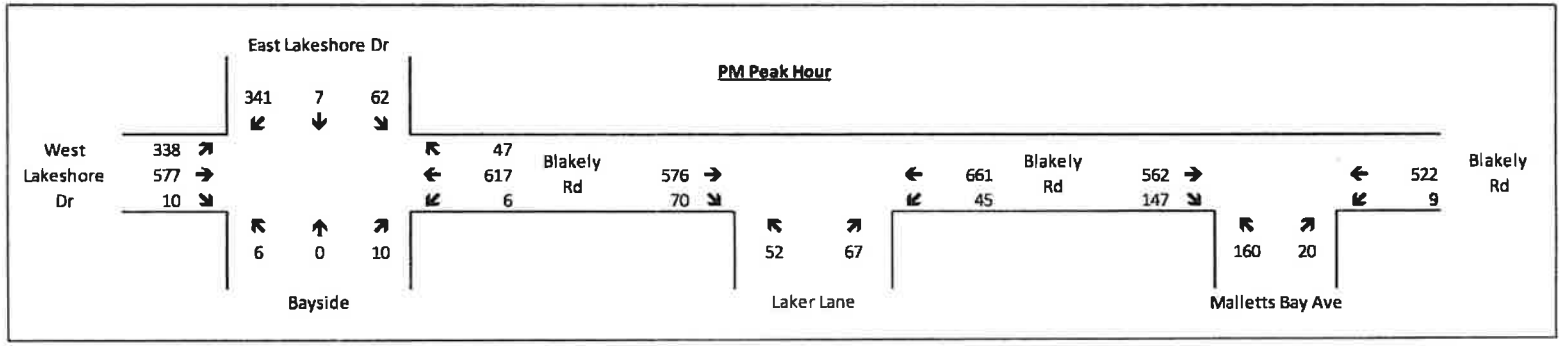


Figure 2 - 2025 No-Build Peak Hour Volumes

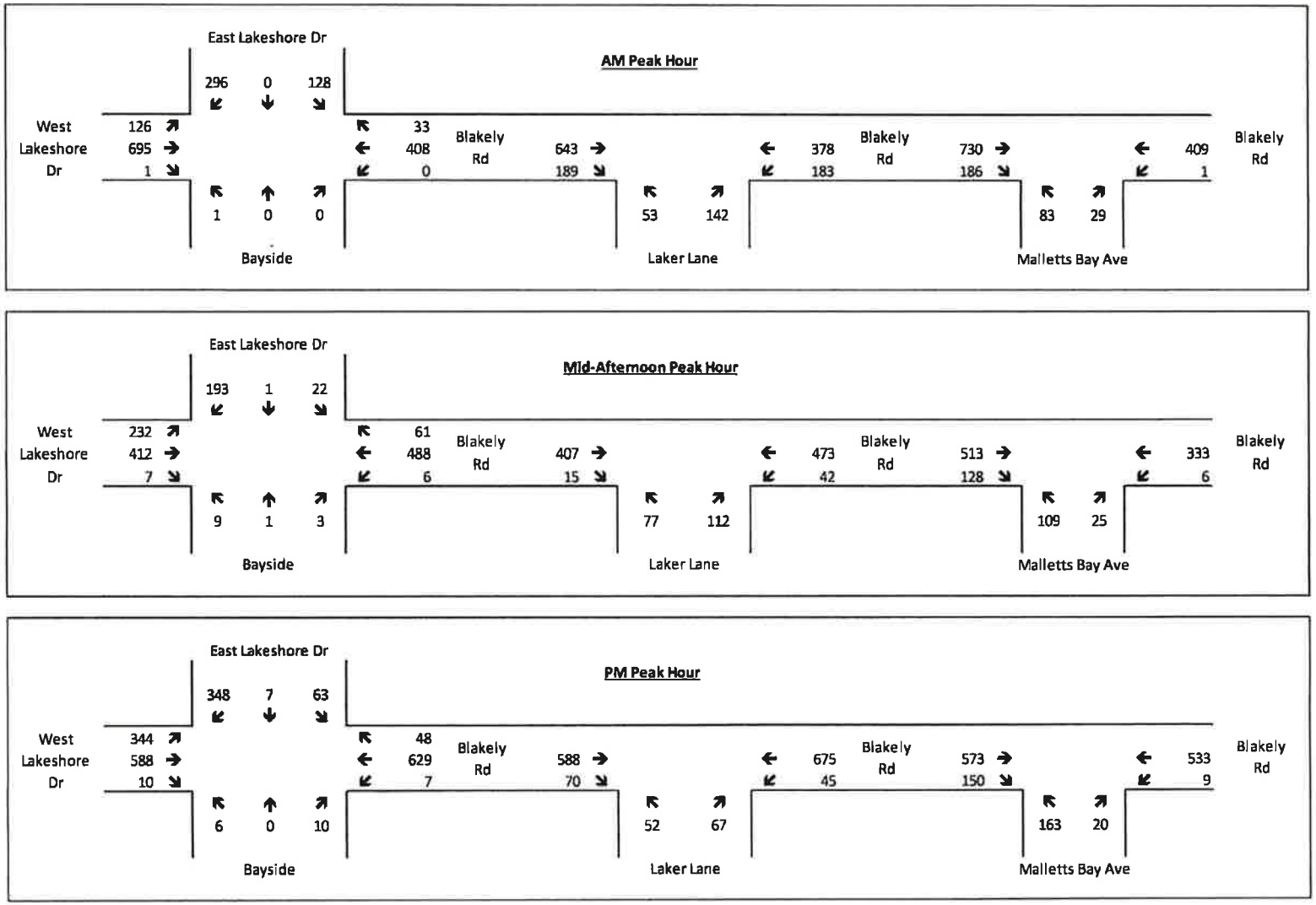


Figure 3 - New EE School Peak Hour Trips

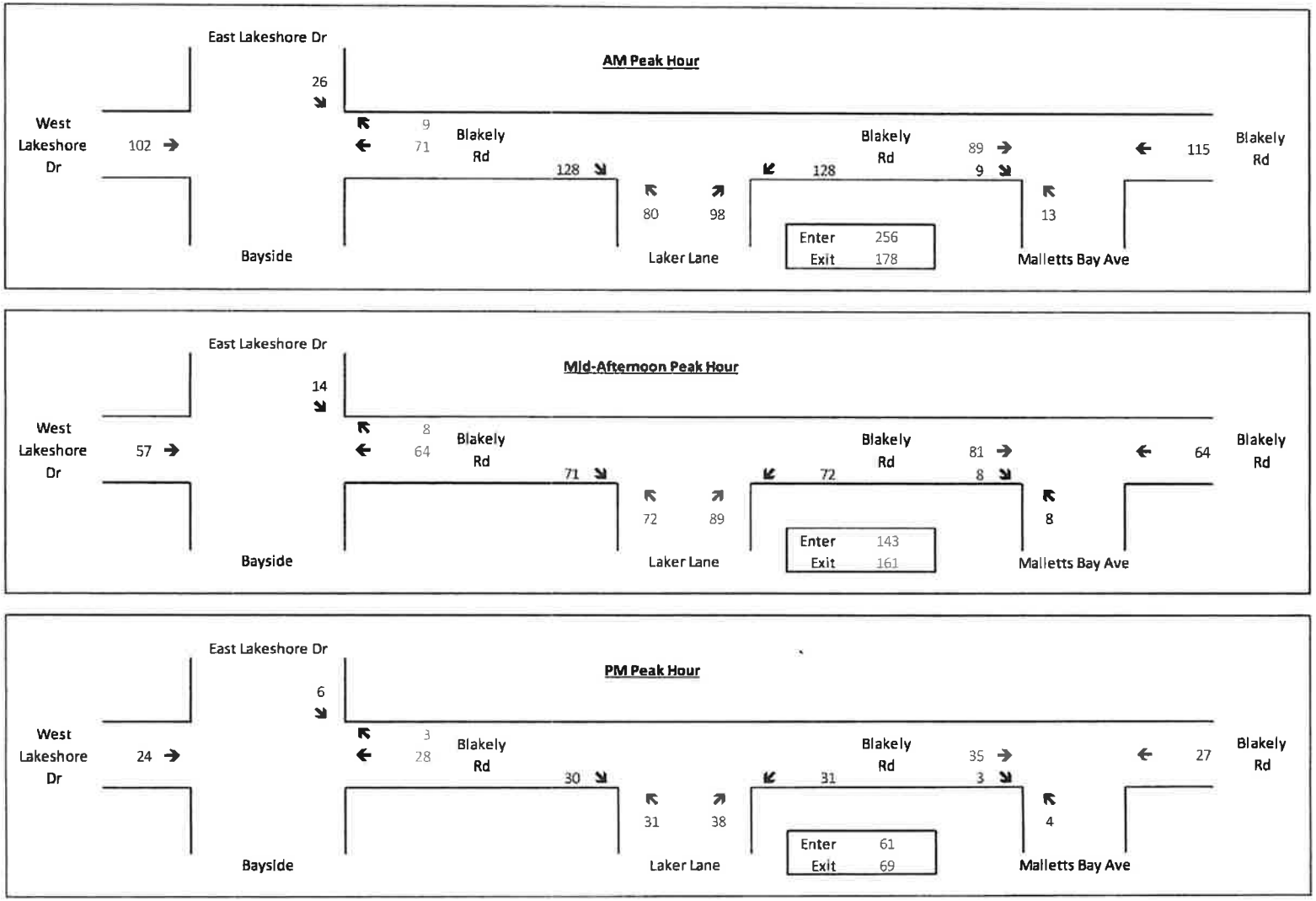


Figure 4 - 2020 Build Peak Hour Volumes

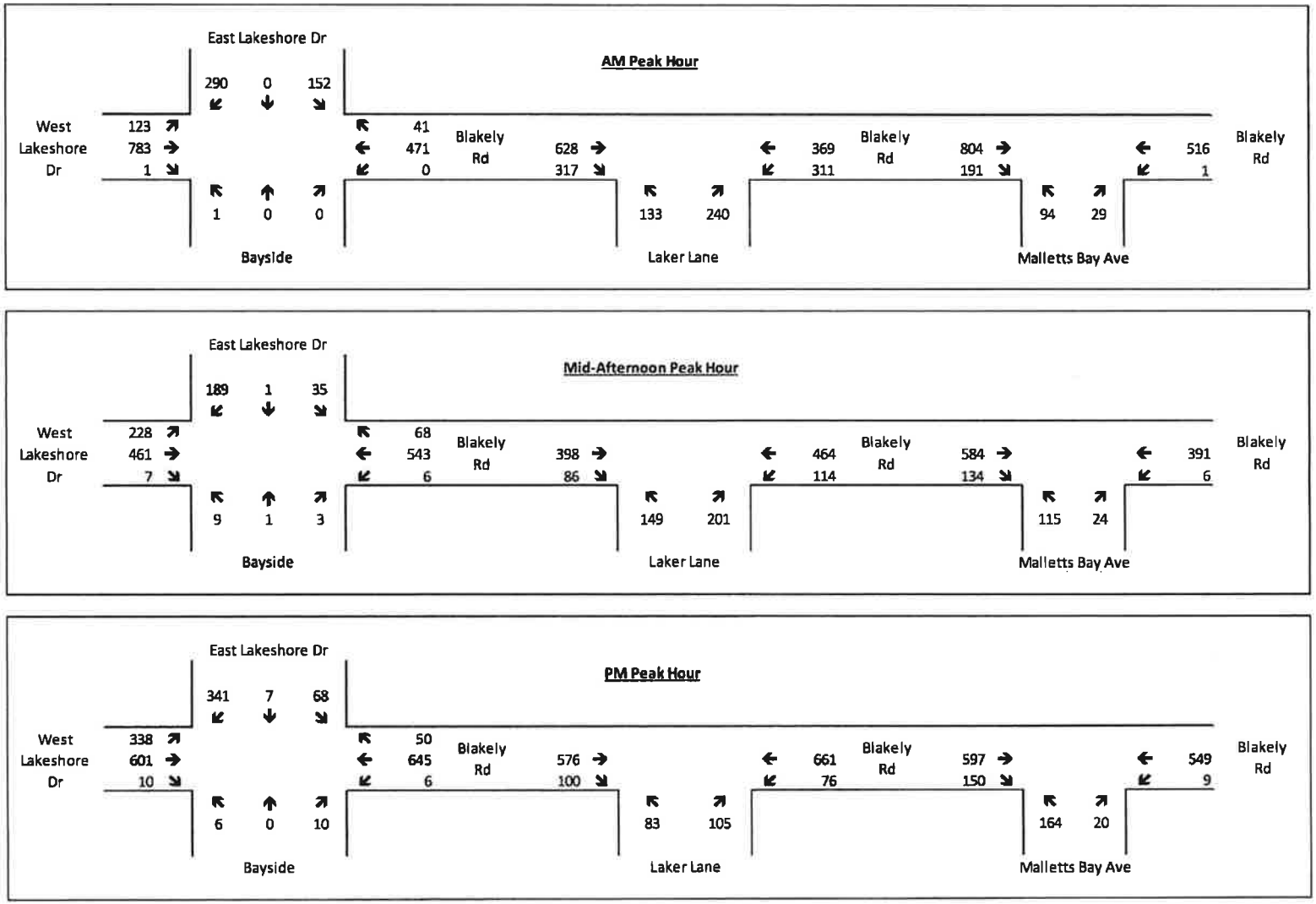
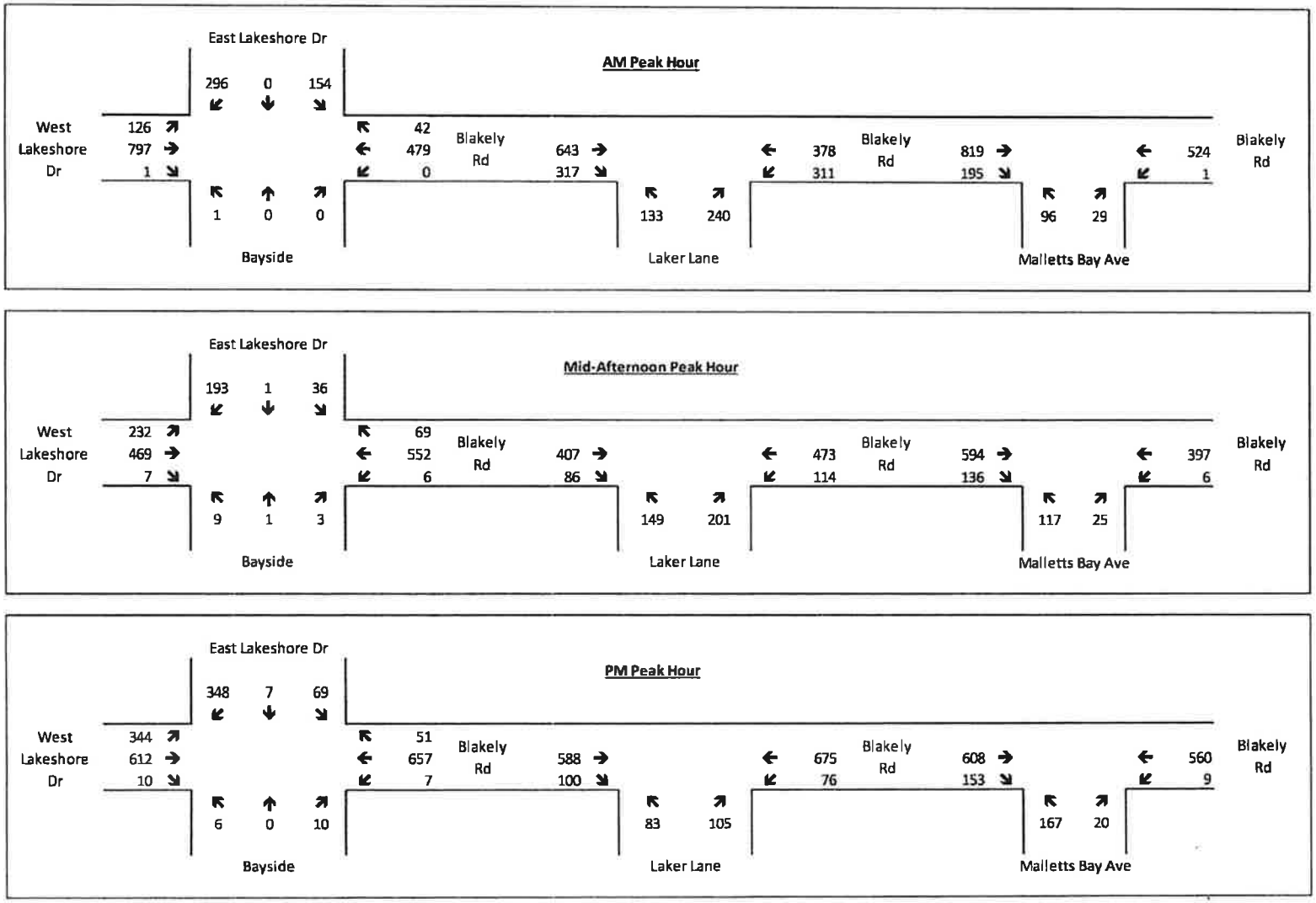


Figure 5 - 2025 Build Peak Hour Volumes



Lamoureux & Dickinson Consulting Engineers, Inc.

Agreement for Professional Services
Standard Terms and Conditions

1. **General:** If a signed Agreement is not received by the CONSULTANT and the work is verbally authorized by the CLIENT and is started and/or accomplished by the CONSULTANT, the Agreement, as is, and the monthly statements for the work performed shall comprise the Contract between the CONSULTANT and the CLIENT. The Agreement is a cost estimate for typical work under normal circumstances and not a not-to-be-exceeded bid. The scope of work and estimated fee are based on our past experience and the anticipated project requirements. Since every project is different, and the scope of work and estimated fee are developed at a time when there are many unknowns about the specific project requirements, it is difficult to foresee the precise extent of the actual work The CONSULTANT will strive to perform the work within the agreed upon budget. Where no Agreement, scope of work, or estimated fee are prepared, then the CONSULTANT shall provide professional services on an as requested basis at the standard hourly rates in accordance with these Standard Terms and Conditions.

2. **Billing & Payment:** Invoices are issued monthly based on the actual time expended during the previous month and the CONSULTANT'S standard rate schedule then in effect. Invoices are due upon presentation, and shall be considered past due if not paid within thirty (30) calendar days of the invoice date. Interest will be charged on overdue accounts at rate of 1.0% per month. If an invoice is not paid within sixty (60) days of presentation, the CONSULTANT may, at its discretion, suspend performance of all services and retain all plans and other documents until the account is brought current. The CONSULTANT shall have no liability whatsoever to the CLIENT for any costs or damages as the result of such suspension caused by nonpayment by the CLIENT.

3. **Collection of Overdue Accounts:** In the event action is necessary to enforce the payment provisions of this Agreement, the CONSULTANT shall be entitled to collect from the CLIENT all collection expenses including any judgement or settlement sum due, reasonable attorney's fees, court costs and expenses incurred in connection therewith.

4. **Standard Rate Schedule:** The CONSULTANT may, at its discretion, review and adjust its standard rate schedule on an annual basis for cost of living increases and inflation.

5. **Unexpected Work:** If the CONSULTANT is requested by the CLIENT to do work that is now unknown, to revise plans already completed, and/or is required to do unexpected work by regulatory agencies, the CONSULTANT shall be equitably paid for the extra services provided based on the time actually expended and expenses incurred in accordance with the standard rate schedule then in effect.

6. **Subconsultants & Permitting Fees:** Unless specifically detailed otherwise, this Agreement does not include permitting fees or fees of other consultants that may be deemed necessary through the course of the project.

7. **Retainer:** At the CONSULTANT'S discretion, a retainer may be requested at the start of work. Such retainer will be applied to the final invoice.

8. **Disputes:** In an effort to resolve any conflicts that may arise during the design, permitting or construction of the project or following the completion of the project, the CLIENT and the CONSULTANT agree that all disputes between them arising out of or relating to this Agreement shall be submitted to non-binding mediation unless the parties mutually agree otherwise.

9. **Governing Law:** The CLIENT and the CONSULTANT agree that all disputes arising out of or in any way connected to this Agreement, its validity, interpretation and performance, and remedies for breach of contract, or any other claims related to this Agreement shall be governed by the laws of the State of Vermont.

10. **Termination:** Either party may terminate this Agreement upon ten (10) calendar day's written notice. In the event of termination, the CLIENT shall pay the CONSULTANT for all services rendered to the date of termination.

11. **Timeliness:** The CONSULTANT will perform its services with due and reasonable diligence consistent with sound professional practices and judgement. The CONSULTANT shall not incur any responsibilities or be liable for damages resulting from the actions or inaction of government agencies, and shall only act as an advisor to the CLIENT in all governmental relations.

12. **Ownership of Documents:** All reports, plans, specification, computer files, field data, notes and other documents and instruments prepared by the CONSULTANT as instruments of service shall remain the property of the CONSULTANT; who shall retain all common law, statutory and other reserved rights, including the copyright thereto.

13. **Unauthorized Changes:** In the event that the CLIENT consents to, allows, authorizes or approves of changes to any plans, specifications or other documents prepared by the CONSULTANT, and these changes are not made by or approved in writing by the CONSULTANT, the CLIENT recognizes that such changes and results thereof are not the responsibility of the CONSULTANT. Therefore, the CLIENT agrees to release the CONSULTANT from any liability arising from the construction, use, or result of such changes.

14. **Time Bar to Legal Action:** All legal actions by either party against the other arising out of or in any way connected with the services to be performed hereunder shall be barred and under no circumstances shall any such claim be initiated by either party after seven (7) years have passed from the date of substantial completion by the CLIENT, unless the CONSULTANT'S services shall be terminated earlier, in which case the date of termination of this Agreement shall be used.

15. **Risk Allocation**: In recognition of the relative risks and benefits of the project to both the CLIENT and the CONSULTANT, the risks have been allocated such that the CLIENT agrees, to the fullest extent permitted by law, to limit the liability of the CONSULTANT for any and all claims, losses, costs, damages of any nature whatsoever or claims expenses from any cause or causes, so that the total aggregate liability of the CONSULTANT shall not exceed $20,000 or the CONSULTANT'S total fee for services rendered on this project, whichever is greater. Such claims and causes include, but are not limited to negligence, professional errors or omissions, strict liability, breach of contract or warranty.

16. **Indemnifications:** Services provided by the CONSULTANT under this Agreement will be performed in a manner consistent with that degree of care and skill ordinarily exercised by members of the same profession(s) currently practicing under similar circumstances in the State of Vermont. The CONSULTANT agrees, to the fullest extent permitted by law, to indemnify and hold the CLIENT harmless from any damage, liability or cost (including reasonable attorney's fees and costs of defense) to the extent caused by the CONSULTANT'S negligent acts, errors or omission in the performance of professional services under this Agreement and those of its subconsultants or anyone for whom the CONSULTANT is legally liable. The CLIENT agrees, to the fullest extent permitted by law, to indemnify and hold the CONSULTANT harmless from any damage, liability or cost (including reasonable attorney's fees and costs of defense) to the extent caused by the CLIENT'S negligent acts, errors or omissions and those of his or her contractors, subcontractors and consultants or anyone for whom the CLIENT is legally liable, and arising from the project that is the subject of this Agreement. The CONSULTANT is not obligated to indemnify the CLIENT in any manner whatsoever for the CLIENT'S own negligence.