



55 Green Mountain Drive
South Burlington, VT 05403

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JUN 29 2016

DEPARTMENT OF
PLANNING & ZONING

June 28, 2016
File: 195311267

Attention: Mr. Dan Goltzman
Redstone
210 College Street, Ste. 201
Burlington, VT 05401

Dear Dan,

Reference: Pine Street Deli Site, Burlington, VT

Per your request we have conducted an investigation of potential traffic and parking impacts associated with the above referenced project. Based on this investigation we conclude that the project will have only nominal impacts on the area roadway system. Furthermore, the roadway system operates at a high level of service under existing conditions and has adequate capacity to also accommodate the project related traffic increases at the same high level of service. Additionally we find that the proposed on-site parking supply is adequate to serve estimated peak demands. More specifically we find that:

- The project will generate only ten to twelve peak hour vehicle trips;
- The project will add only one or two new peak hour vehicle trips through the Pine Street and Flynn Avenue intersection; and,
- The project will generate a peak parking demand of 30 vehicles compared to a proposed parking supply of 34 spaces.

PROJECT DESCRIPTION

The proposed project is a mixed-used development to be located on the site of the existing Pine Street Deli and bottle redemption center at the intersection of Pine Street and Flynn Avenue in Burlington, Vermont. The current use consists of an approximately 2,800 square foot deli/convenience store, an approximate 1,000 square bottle redemption center and a three-unit apartment building. These uses are supported by 16 marked and approximately ten informal (unmarked) parking spaces on the site. Vehicular access is available by way of curb cuts on both Pine Street and Flynn Avenue. The proposed project includes demolition of the existing buildings on the site. In their place, a multi-story building will be constructed housing 30 residential apartment units on the upper floors and 3,000 square feet of commercial space at street level. Approximately 34 shared parking spaces will be provided. The two existing vehicular access points will be reconstructed and maintained. The conceptual site plan is shown in Figure 1.



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EXISTING CONDITIONS

The project study is principally limited to the Pine Street and Flynn Avenue intersection. Existing conditions in the study area are described below.

Site and Roadways

The project site is located adjacent to the signalized Pine Street and Flynn Avenue intersection. Two-way, two-lane site driveways are provided on both streets. The Pine Street driveway is located approximately 200 feet north of the centerline of Flynn Avenue and the Flynn Avenue driveway is located approximately 80 east of the centerline of Pine Street. The site locus is shown in Figure 2.

The Pine Street and Flynn Avenue intersection operates with single lane approaches northbound and eastbound. The southbound approach provides a shared through/right-turn lane and a dedicated left-turn lane. The southbound left-turn movement operates with an advance signal phase. Green and yellow left-turn arrows are provided on this approach. The westbound approach is striped as a single lane; however, traffic informally stacks in two-lanes on occasion with the right lane dedicated to right-turn movements. No "right-turn-on-red" is allowed from Flynn Avenue westbound when pedestrians are crossing Pine Street. Special signage is provided to control this movement. Sidewalks are provided on both sides of both streets. Pedestrian signals with "push button" actuation are also provided crossing each leg of the intersection.

Pine Street and Flynn Avenue serve commuter traffic headed into and out of Burlington. Inbound traffic will turn left from Shelburne Street (US Route 7) northbound at a signalized intersection located approximately one-quarter mile east of Pine Street and then turn right on Pine Street to continue northbound. Flynn Avenue is wide enough to provide one travel lane in each direction and on-street parking on this segment. West of Pine Street Flynn Avenue terminates at Oakledge Park and Lake Champlain. This section also includes on-street parking however the roadway is not as wide here. Pine Street at the intersection draws northbound commuter traffic from both Flynn Avenue and Pine Street south of the intersection. In the site vicinity no parking is allowed on Pine Street. North of the site and south of the intersection a single lane is provided in each direction. There is a bus stop and shelter located on the east side of Pine Street just north of the Pine Street site driveway. North of the bus stop is the Champlain Elementary School.

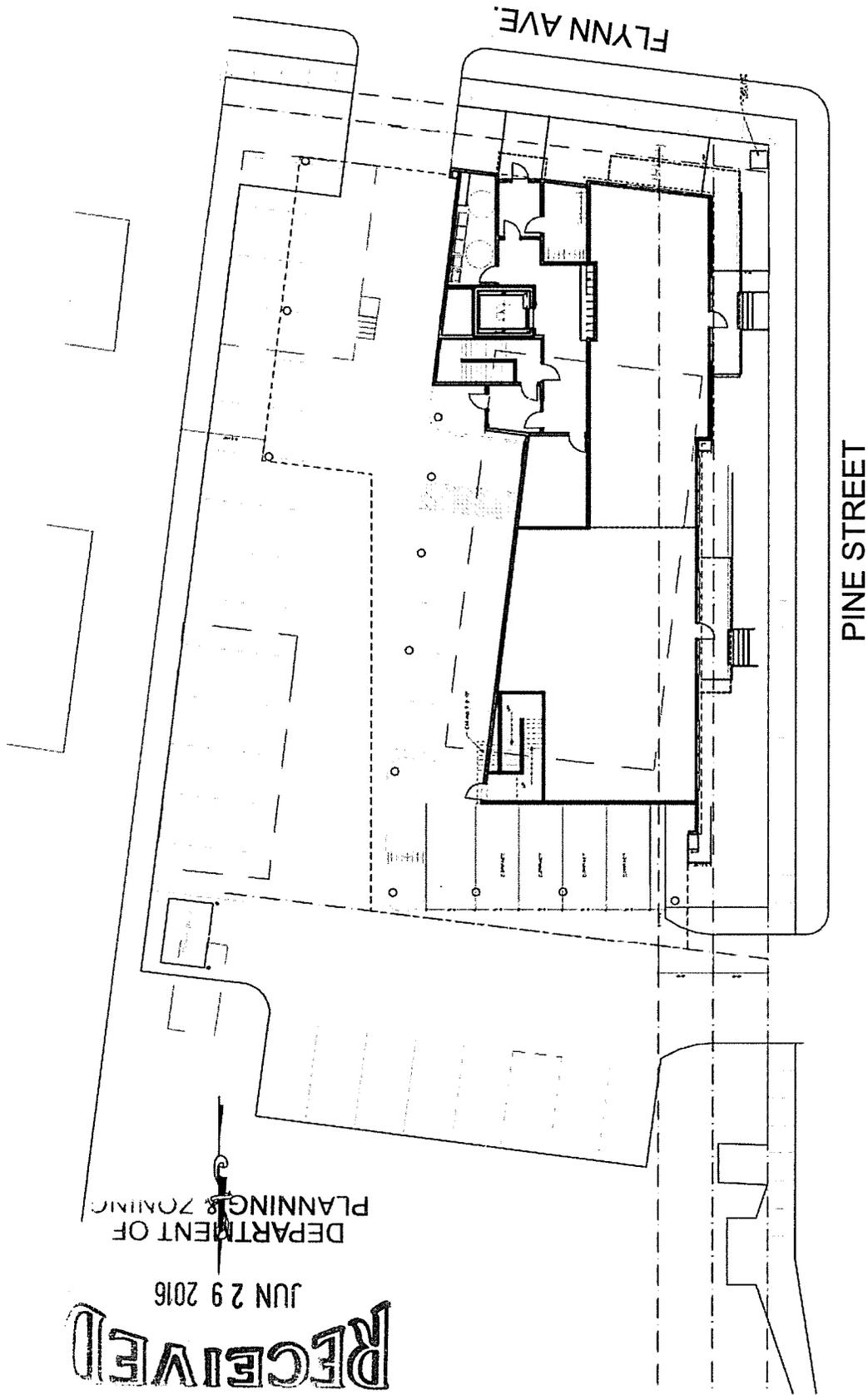
Public Transportation

The Chittenden County Transit Authority (CCTA) operates several bus routes along Pine Street adjacent to the project site. Route 3, Pine Street, provides frequent local service. Three commuter routes originating outside the City, including the LINK Express service between Burlington and Montpelier, also operate along Pine Street however, with many fewer trips. Commuter route operations are generally limited to commuter hours. As noted there is a sheltered bus stop at the north end of the project site on the east side of Pine Street. Other stops are located along Pine Street and Flynn Avenue.

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PINE STREET

FLYNN AVE.

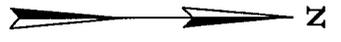
FIGURE 1
CONCEPTUAL SITE PLAN

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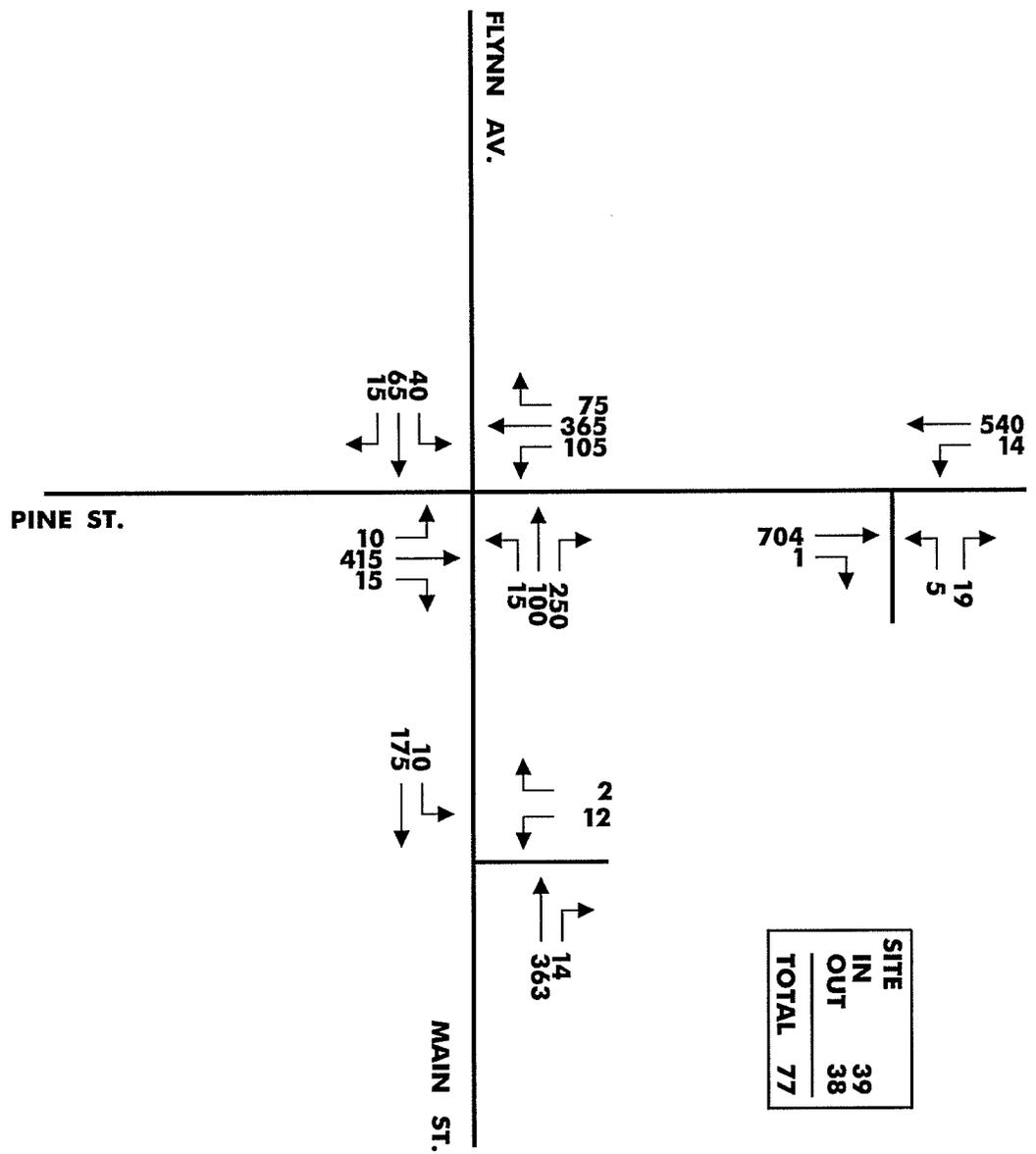
FIGURE 2
SITE LOCATION MAP



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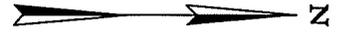


SITE	IN	OUT
	39	38
TOTAL	77	

FIGURE 3
2016 EXISTING AM PEAK HOUR TRAFFIC VOLUMES

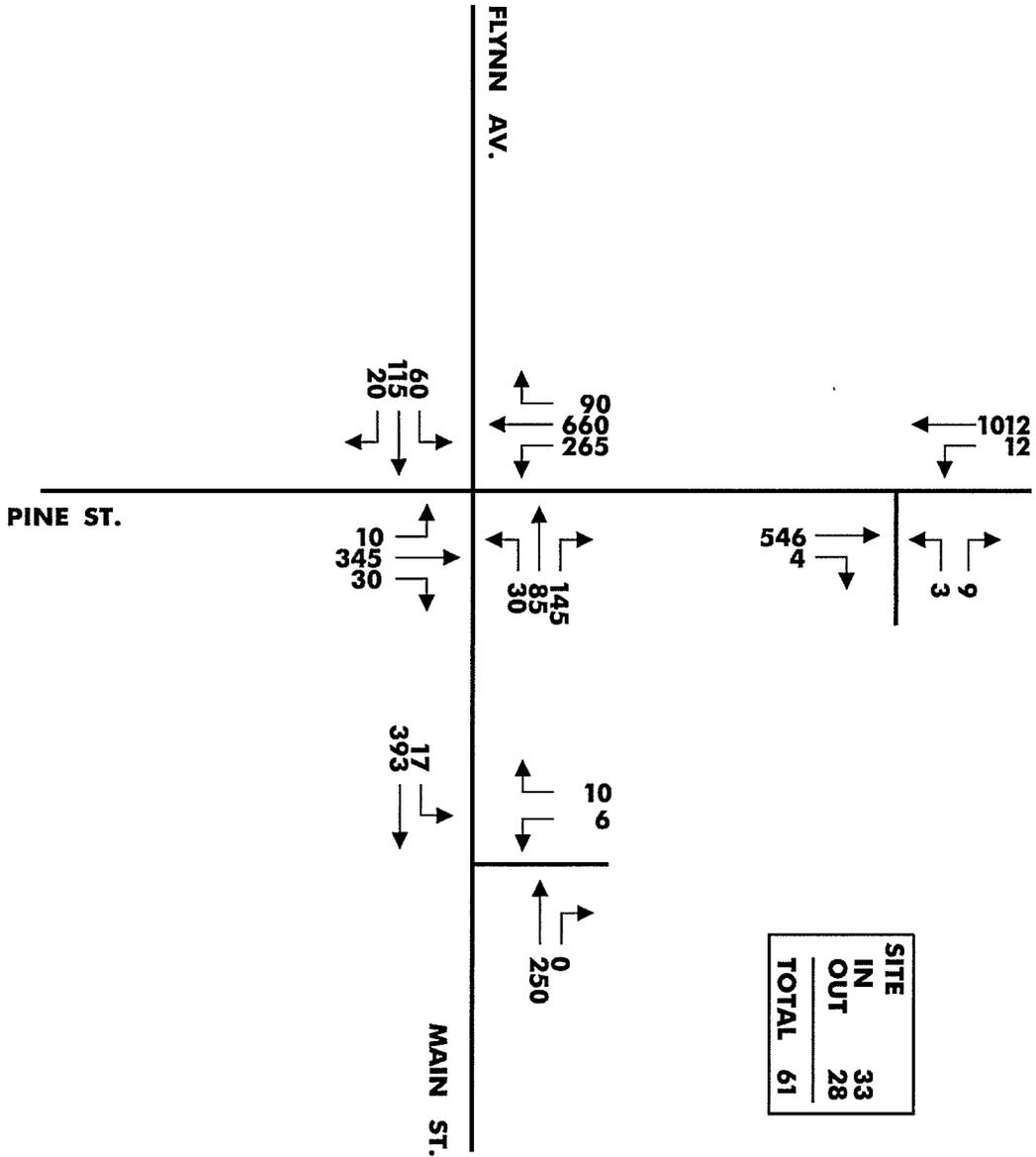


PINE STREET DELI SITE
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SITE	IN	OUT
	33	28
TOTAL	61	

FIGURE 4
2016 EXISTING PM PEAK HOUR TRAFFIC VOLUMES





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Traffic Volumes

Traffic volume data are collected periodically by the Vermont Agency of Transportation (VTTrans) and by the Chittenden County Regional Planning Commission (CCRPC) at major intersections in the region. Vehicle classification counts taken before 2014 were compiled and reviewed most recently for *Plan BTV-South End*. The Transportation section of the *Plan BTV-South End* February 9, 2015 report was used to identify 2014 Design Hour Volumes for the Pine Street and Flynn Avenue intersection. Design Hour Volumes are calculated to represent the 30th highest volume hour of the year and therefore represent a conservative design condition. The Plan BTV volumes are attached to this report. The volumes define existing commuter patterns with the heaviest flows during the morning peak hour headed northbound on Pine Street and during the evening peak hour headed southbound on Pine Street.

Stantec conducted peak period traffic counts at or adjacent to the project site in early June 2016 prior to the end of the school year at the Champlain School. Volumes were collected for a variety purposes. Weekday counts were done from 7 to 9 AM and from 4 to 6 PM to determine: existing traffic generation at the project site; existing through traffic volumes on three legs of the Pine Street and Flynn Avenue intersection; and existing trip generation and trip distribution for two existing residential projects in the site vicinity. The collected data are attached. The collected data are described below.

Vehicle turning movement counts were taken at both of the site driveways and at the driveways to the Flynn Housing Co-op located on Flynn Avenue a few hundred feet west of Pine Street and at the Champlain School Apartments located just north and west of the deli site. In addition to counting vehicles turning at each driveway, traffic volumes were also counted on the adjacent streets. A comparison of peak hour volumes on three legs of the intersection measured in June 2016 to the reported 2014 Design Hour Volumes in *Plan BTV, South End* showed that the 2016 volumes were six percent higher during the AM peak hour and 15 percent higher during the PM peak hour or ten percent higher on average. As such, the Pine Street and Flynn Avenue intersection volumes reported in *Plan BTV, South End* were increased by ten percent and then combined with the volumes measured at the site driveways in 2016 to develop the Existing 2016 traffic networks. These networks are shown in Figures 3 and 4. As shown, the site generates 77 vehicle trips during the AM peak traffic hour and 61 vehicle trips during the PM peak traffic hour. Traffic is fairly evenly split between the two driveways. The balance of incoming and outgoing trips also is consistent with the short-duration visits associated with the existing deli.

Parking

Parking demands at the subject site are assumed to peak at midday when the deli workers are busy serving lunchtime customers. Measurements were made of the on-site parking demands in early June 2016 from 11:30 AM to 12:30 PM on a typical weekday. Similar observations were made at the above referenced residential developments. The collected data are attached. The observations indicate a peak parking demand at the deli of 15 vehicles occurring at 12:30 PM. This demand includes three vehicles associated with the non-deli uses on the site. As such, the existing peak parking demand for the deli is estimated at 12 vehicles or approximately 4.3 spaces per 1000



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square feet of floor area for the 2800 square-foot deli. Parking demand for the two residential apartment buildings is discussed in a later section of this report.

Operations

Existing intersection peak hour operating levels of service were calculated for the Pine Street and Flynn Avenue Street intersection following procedures described in the latest edition of the *Highway Capacity Manual*. Operating level of service (LOS) is a term used to describe the quality of traffic flow on a roadway. It is an aggregate measure of travel delay, travel speed, congestion, driver discomfort, convenience, and safety based on a comparison of roadway capacity to travel demand. Operating levels of service are reported on a scale of A to F with LOS A representing the best operating conditions (little or no delay to motorists) and LOS F representing the worst operating conditions (long delays and with traffic demands sometimes exceeding roadway capacity.) As noted in Table 1, the study intersection presently operates at LOS B during the AM and PM peak hours. Operating conditions reported in *Plan BTV, South End* are also shown in Table 1. As expected, the higher traffic volumes used in the 2016 analysis indicate slightly longer vehicle delays than reported for 2014 conditions.

Peak Hour	Existing 2016			2014 Design Hour		
	Stantec			Plan BTV, South End		
	LOS ¹	Delay ²	V/C ³	LOS	Delay	V/C
AM	B	18	0.76	B	12	0.60
PM	B	20	0.89	B	12	0.70

¹ LOS= Level of Service

² Delay = Average delay expressed in seconds per vehicle

³ V/C = Volume-to-capacity ratio for critical movements

Table 1 Existing Pine Street/Flynn Avenue Intersection Operations

FUTURE CONDITIONS

Traffic volume conditions on the area roadway system were developed for a future Build scenario. The "Build" scenario assumes that traffic generated by the proposed development is combined with the Existing 2016 traffic volumes. Future traffic conditions at the Pine Street and Flynn Avenue intersection were analyzed and compared to 2016 Conditions to quantify the impact of project traffic on operations.

Site Traffic

Traffic forecasts for the proposed development project were developed considering the proposed change in land use conditions at the site. As noted above, the project will include 30 residential apartment units and 3000 square feet of commercial space. All existing uses on the site will be removed.



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In order to estimate project related traffic increases on the roadway system it was assumed that all existing site traffic will remain and only traffic associated with the proposed residential use would be treated as new traffic. This is considered a conservative analysis given the uncertainty regarding the future use of the commercial space. The commercial space could be used as office and/or retail, uses that generate substantially less traffic per square foot floor space than the existing deli. A "worst case" scenario would assume that another food service business replaces the existing deli and generates the same vehicular traffic that is now generated by the deli, bottle redemption service and three apartments located on the site.

The second part of the traffic forecasting requires estimating the number of vehicle trips associated with the proposed 30 apartment units. Typically, trip generation rates published by the Institute of Transportation Engineers (ITE) in *Trip Generation* could be applied. ITE trip rates for Land Use Code 220-Apartment indicate that apartments generate 0.51 AM peak hour vehicle trips per dwelling unit and 0.62 PM peak hour vehicle trips per dwelling unit. These trip rates however, are based on data generally collected at suburban sites where pedestrian, bike and transit trips are nominal. Downward adjustments to the ITE rates are appropriate where alternative travel modes may represent a significant portion of all site trips. Given the proximity of the project site to downtown Burlington and its convenient access to transit, local data were collected to determine an appropriate trip generation rate for this site.

As noted above, peak period traffic counts were conducted at the 28-unit Flynn Housing Co-op on Flynn Avenue and at the 76-unit Champlain School Apartments. The proposed residential use would be expected to exhibit vehicle trip generation characteristics similar to these residential properties given their proximity to the project site. Counts done at these two sites indicate that they generate vehicle trips at rates that amount to only 62 to 75 percent of the applicable ITE rates as shown in Table 2.

Site	Dwelling Units	Peak Hour	Vehicle Trips	Trip Rate ¹	ITE Rate ²	Local Rate as % of ITE Rate
Champlain School	76	AM	24	0.32	0.51	62%
		PM	29	0.38	0.62	62%
Flynn Ave. Co-op	28	AM	9	0.32	0.51	63%
		PM	13	0.46	0.62	75%

¹Vehicle trips per dwelling unit.

²Source: ITE, *Trip Generation*, 9th Edition, Land Use Code 220 – Apartment.

Local trip rates based on driveway counts conducted by Stantec June 2016.

Table 2 Locally Observed Trip Generation Rates

In consideration of the locally observed data, trip estimates developed for the proposed residential use using ITE trip rates were reduced to 65 percent of their calculated value for this study. The estimated vehicle trip generation is shown in Table 3. The proposed new residential use at the site is only expected to generate ten new AM peak hour vehicle trips and 12 new PM peak hour vehicle trips.



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Peak	Direction	Trip Rate ¹	Unadjusted Trips	Adjusted Trips
AM	IN	0.10	3	2
	OUT	0.41	12	8
	TOTAL	0.51	15	10
PM	IN	0.40	12	8
	OUT	0.22	7	4
	TOTAL	0.62	19	12
Daily	IN	3.33	100	65
	OUT	3.33	100	65
	TOTAL	6.65	200	130

¹Source: ITE, *Trip Generation, 9th Edition*, Land Use Code 220 – Apartment. Vehicle trips per dwelling unit. Adjusted Trips reflect 65 percent of the unadjusted trips.

Table 3 Estimated New Site Traffic (Residential Trips)

Trip Assignments

Anticipated new site generated vehicle trips were assigned to the site driveways and area roadway network. It was assumed that approximately half of the trips would be oriented to north of the site and approximately half of the trips would be oriented to the south and Flynn Avenue. This distribution is based on the observed traffic patterns at the Champlain School Apartments driveway. The resulting traffic assignments for the AM and PM peak hours are shown in Figure 5. As shown, the two site driveways provided allow traffic to disperse with nominal impacts on the Pine Street and Flynn Avenue intersection. Only one or two peak hour vehicles are added to the intersection resulting in traffic increases that are well below one percent of the existing volume through the intersection. Traffic increases of only 0.2 percent during the AM peak hour and 0.1 percent during the PM peak hour are expected.

Future Traffic Networks

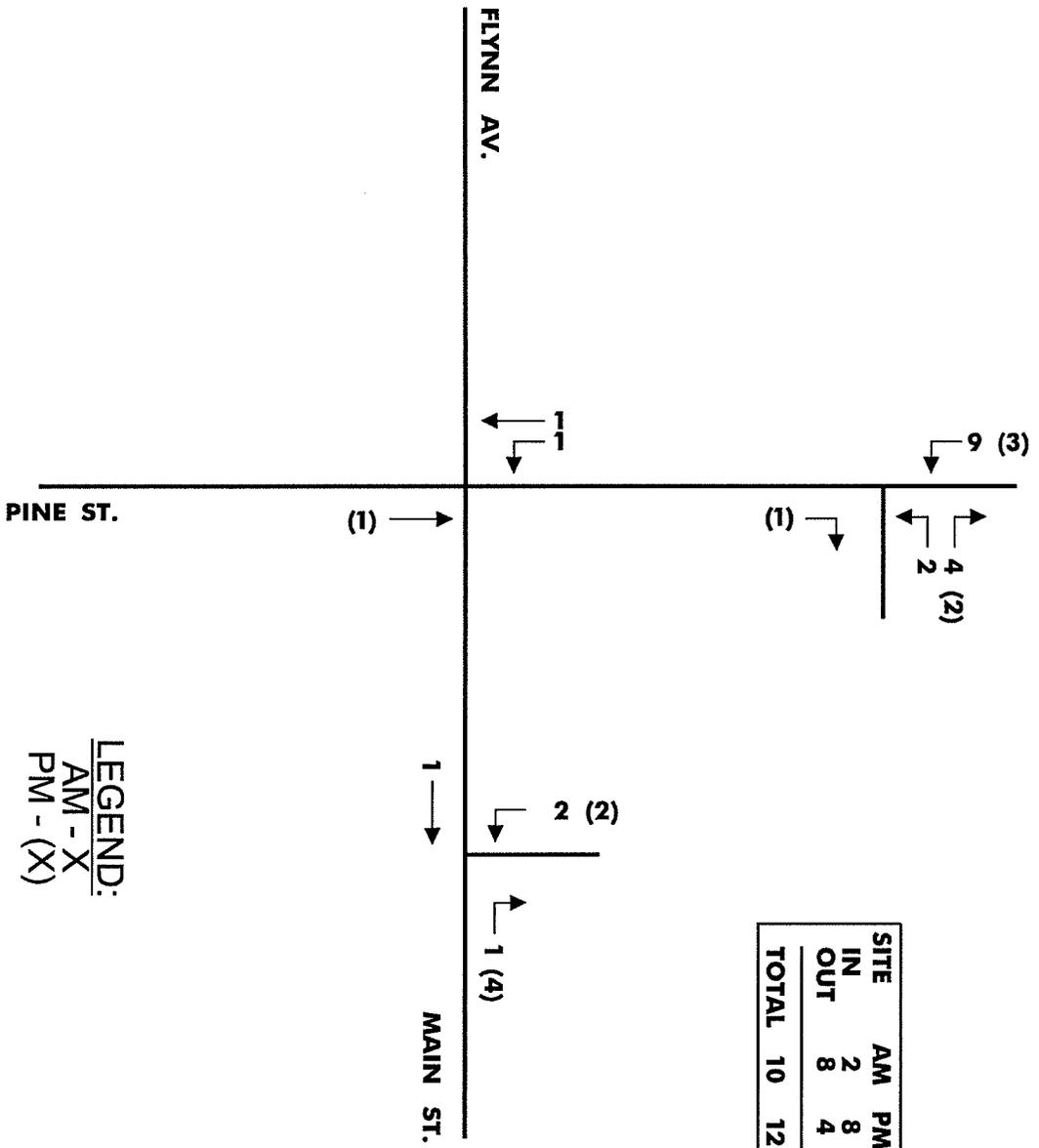
The combined project traffic and existing traffic volumes represent the Build condition traffic volumes. The Build volumes are shown in Figures 6 and 7, respectively.

Future Traffic Operations

The traffic operations analyses completed above for existing traffic conditions were repeated for Build conditions for the Pine Street and Flynn Avenue intersection. The results are presented in Table 4. As shown, the subject intersection will experience no measurable decline in operations due to the proposed development. The calculated level of services under Build conditions remain the same as reported for Existing conditions. Capacity analysis worksheets for all analysis conditions are attached.



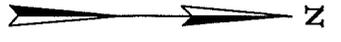
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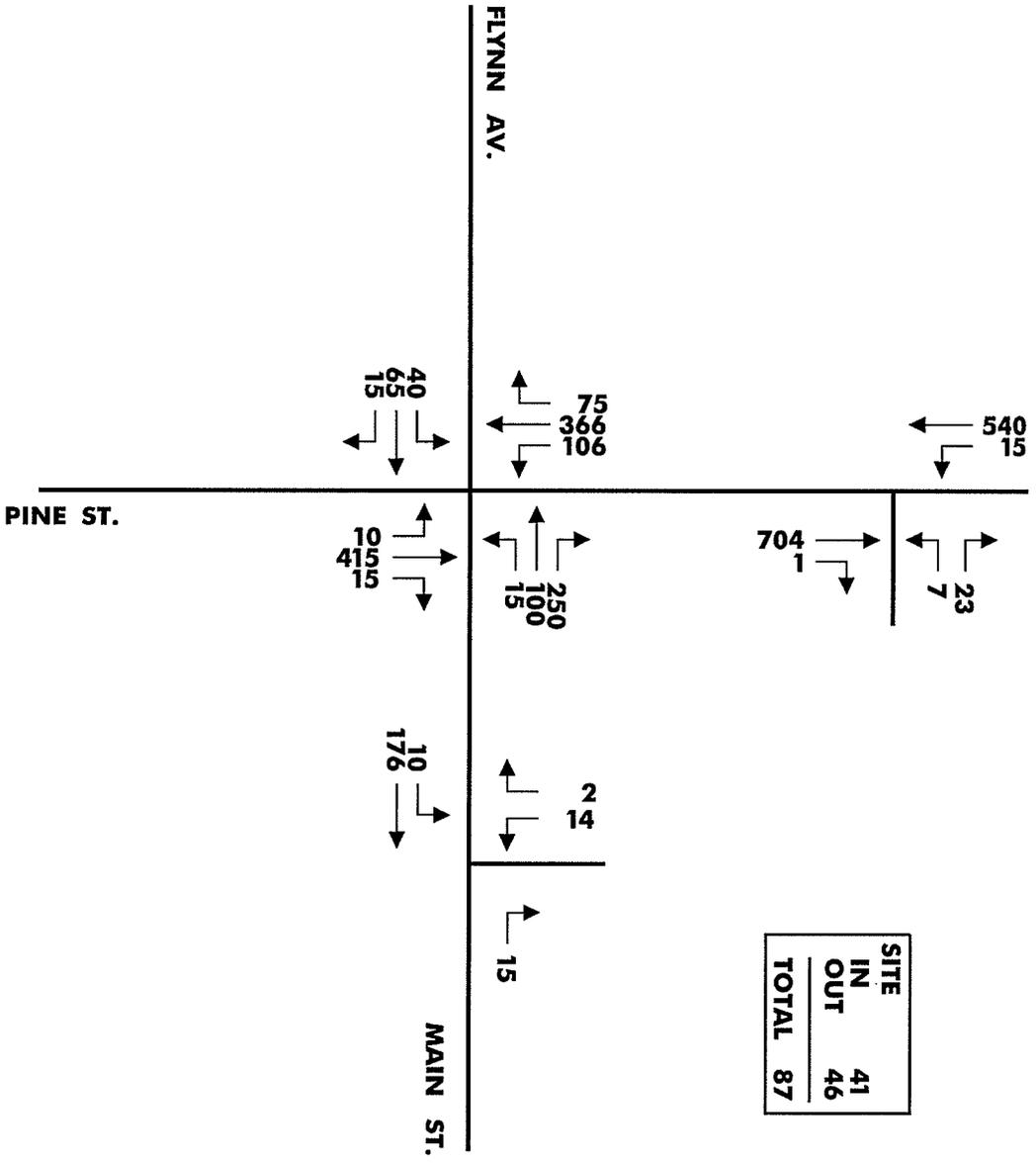
SITE	AM	PM
	IN	2
OUT	8	4
TOTAL	10	12

FIGURE 5
 NEW SITE GENERATED TRAFFIC VOLUMES





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SITE	
IN	41
OUT	46
TOTAL	87

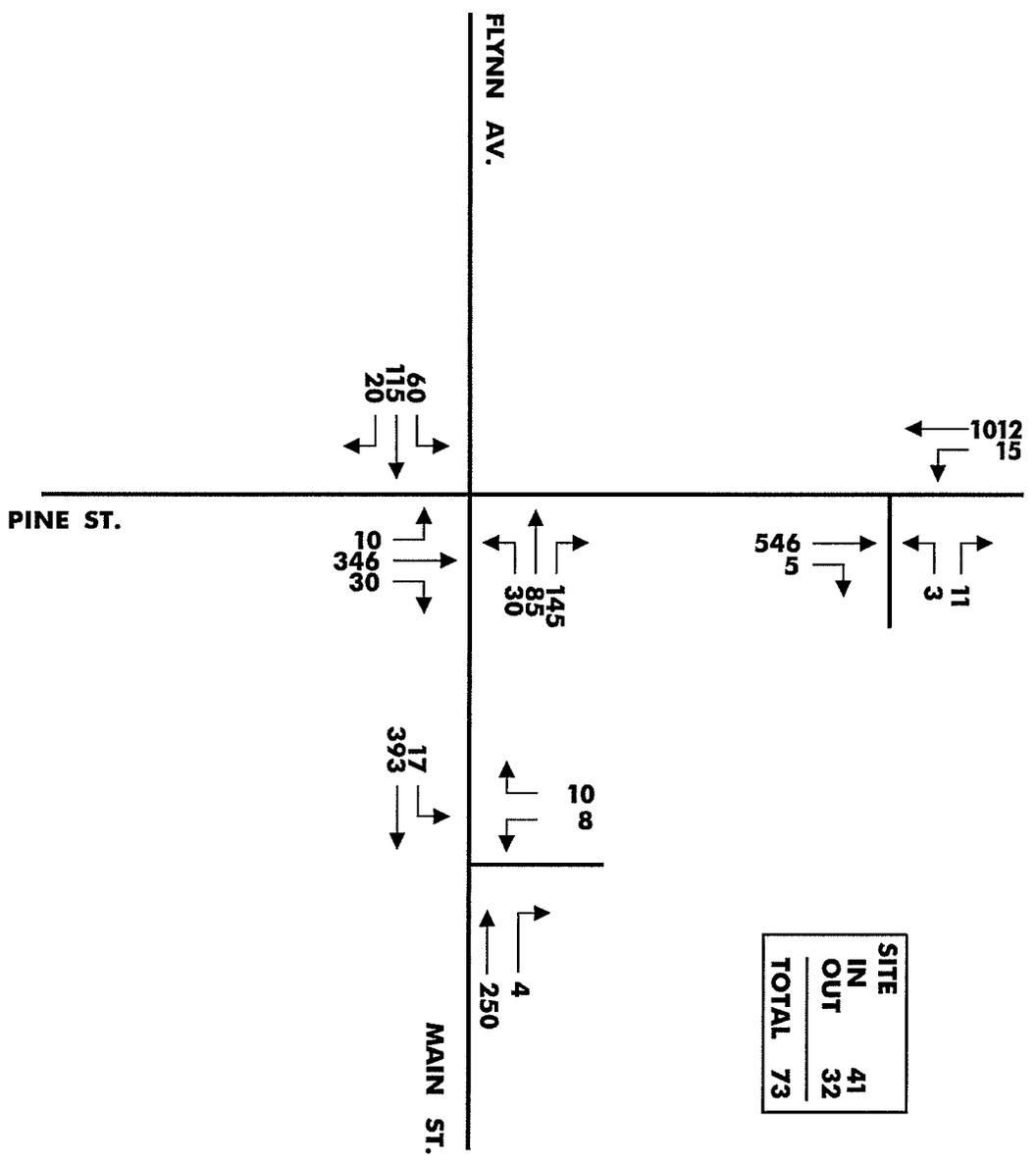
FIGURE 6
 2016 AM PEAK HOUR BUILD TRAFFIC VOLUMES



PINE STREET DELI SITE
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SITE	IN	OUT
	41	32
TOTAL	73	

FIGURE 7
 2016 PM PEAK HOUR BUILD TRAFFIC VOLUMES



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Peak Hour	Existing 2016			2016 Build		
	LOS ¹	Delay ²	V/C ³	LOS	Delay	V/C
AM	B	18	0.76	B	18	0.76
PM	B	20	0.89	B	20	0.89

¹ LOS= Level of Service

² Delay = Average delay expressed in seconds per vehicle

³ V/C = Volume-to-capacity ratio for critical movements

Table 4 Future Pine Street/Flynn Avenue Intersection Operations

Future Parking Conditions

The parking analysis for this project was conducted consistent with the traffic analysis. It was generally assumed that the future commercial use would generate parking demands similar to those of the existing deli use at the site. As such, the future parking demand represents the combined parking demand of the deli and the proposed residential use.

The parking analysis considered midday peak parking demands as food service demands will peak at lunch time. Residential parking demands typically peak at midnight or later. The critical analysis period is therefore midday when the proposed 34 on-site parking spaces must serve the midday food service demand while simultaneously accommodating residents' vehicles which may be left at the site during the day.

As noted above, the midday parking demand for the existing deli is approximately 12 vehicles. Parking demand for the proposed residential use was again determined by examining conditions at nearby, comparable residential developments. Measurements taken in June 2016 indicate that the 28-unit Flynn Housing Coop development uses a peak of 14 spaces at midday or 0.50 spaces per dwelling unit. The 76-unit Champlain School Apartments uses 41 spaces at midday or 0.54 spaces per dwelling unit. Applying the higher ratio (0.54) to the proposed project indicates that the residential component of the project will require 16 parking spaces at midday. The expected combined midday parking demand at the project site is there 30 vehicles. The proposed on-site parking supply will include 34 spaces.

RECOMMENDATIONS

As noted above, the proposed development will not have a significant impact on traffic operations at the Pine Street and Flynn Avenue intersection. Proposed construction at the site will alter the existing site driveways and move the Flynn Avenue driveway slightly closer to the existing CCTA bus stop. Future parking demands at the site should be met with a reserve capacity of four spaces at midday based on the assumption that future commercial tenants at the project generate no more midday parking demand than the existing deli. In light of the above findings it is recommended that:



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- The applicant work closely with the CCTA in the development of final design plans to ensure that adequate and appropriate access is provided for the existing bus stop;
- The applicant reassess expected site parking demands when tenants for the proposed commercial space are identified; and,
- The applicant will monitor and manage future on-site parking to ensure that all users' needs are being adequately met.

CONCLUSION

The proposed development will not have a significant impact on area traffic operations. It will add negligible volume to Pine Street and Flynn Avenue intersection. The intersection presently operates well below its capacity during commuter peak hours and will continue to do so after the project is built.

Thank you for the opportunity in assisting you with this project. Please do not hesitate to call if you have questions regarding the above.

Regards,

Stantec Consulting Services Inc.

Richard S. Bryant
Associate
Phone:802 864 0223
Fax:802 864 0165
Richard.Bryant@stantec.com

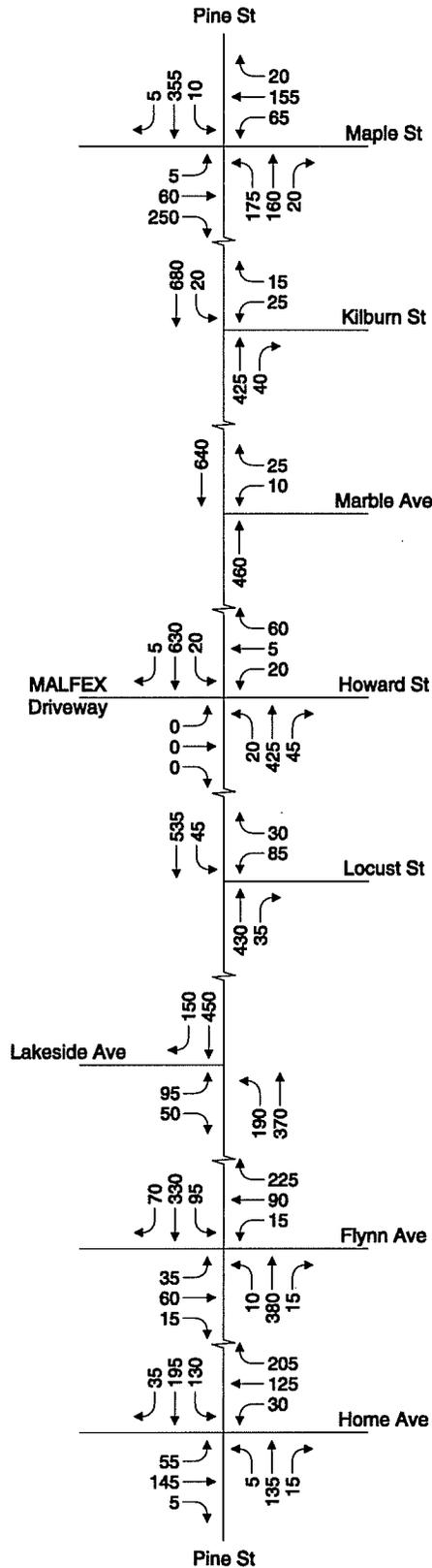
Attachments: Plan BTV, South End Traffic Volumes, Stantec June 2016 Traffic and Parking Counts, Capacity Analysis Worksheets

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Plan BTV, South End
Traffic Volumes

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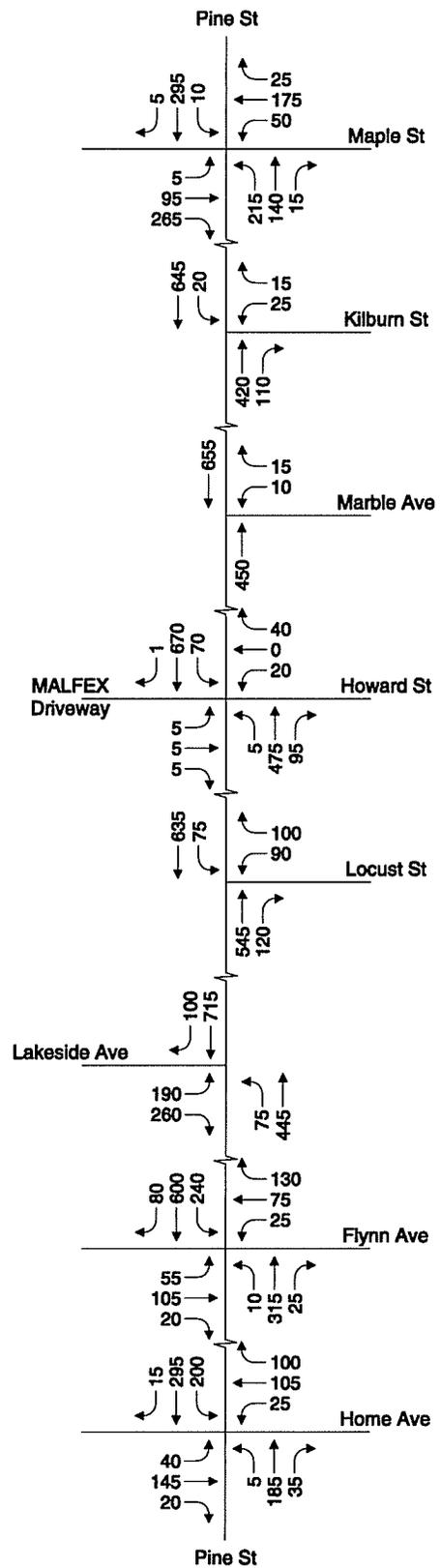
Not to Scale

Vanasse Hangen Brustlin, Inc.

2014 Weekday Morning
 Peak Hour Traffic Volumes

Figure 1

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↑
 Not to Scale

Vanasse Hangen Brustlin, Inc.

2014 Weekday Evening
 Peak Hour (DHV) Traffic Volumes

Figure 2

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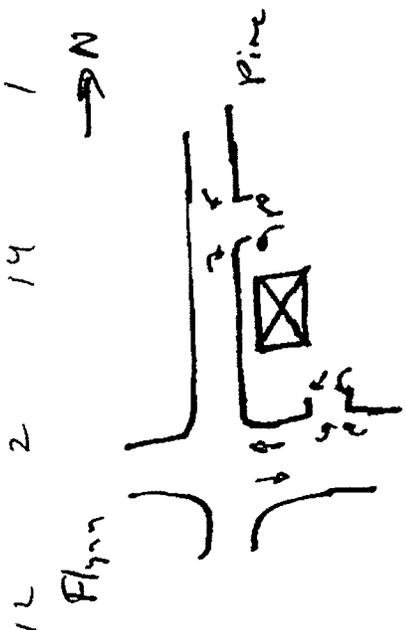
Stantec, June 2016
Traffic and Parking Counts

Pine Street Dell - Traffic Counts AM

Date: 6/7/2016 Done By: C. B. [Signature]

Time Slot	Flynn Ave.				Pine Street				Flynn Ave. @ Stop Bar		
	In		Out		In		Out		Westbound	Eastbound	
	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	
7:00 - 7:15 AM	3	1	1	1	1	2	1	1	44	30	74
7:15 - 7:30 AM	6/3	1/φ	5/4	1/φ	2/1	5/3	3/2	4/3	8/11	56/26	70
7:30 - 7:45 AM	6/φ	3/2	7/2	3/2	7/5	5/φ	3/φ	9/5	149/60	76/20	80
7:45 - 8:00 AM	8/2	3/φ	10/3	4/1	10/3	7/2	4/1	12/3	225/77	106/30	107
8:00 - 8:15 AM	12/4	13/10	14/4	5/1	14/4	7/φ	6/2	18/6	331/106	146/40	146
8:15 - 8:30 AM	13/1	14/1	19/5	5/φ	15/1	8/1	7/1	23/5	394/103	194/48	111
8:30 - 8:45 AM	16/3	14/φ	20/1	6/1	19/4	8/φ	8/1	26/3	446/52	225/31	83
8:45 - 9:00 AM	18/2	17/3	22/2	6/φ	24/5	8/φ	9/1	31/5	553/107	267/12	151

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Pine Street Dell - Traffic Counts PM

Date: 6/5/2016 Done By: C. B. [Signature]

Time Slot	Flynn Ave.				Pine Street				Flynn Ave. @ Stop Bar		
	In		Out		In		Out		Westbound	Eastbound	
									Count	Count	
4:00 - 4:15 PM	0	1	4	0	1	3	1	3	44	83	127
4:15 - 4:30 PM	7/7	1/0	5/1	2/2	2/1	4/1	2/1	5/2	94/50	167/84	134
4:30 - 4:45 PM	8/1	1/0	7/2	3/1	5/3	5/1	2/0	7/2	133/39	202/95	134
4:45 - 5:00 PM	12/4	1/0	7/0	3/0	6/1	5/0	3/1	12/5	185/52	340/78	130
5:00 - 5:15 PM	10/6	1/0	10/3	4/1	9/3	5/0	5/2	15/3	233/48	445/105	153
5:15 - 5:30 PM	22/4	1/0	12/2	6/2	14/5	6/1	6/1	19/4	292/59	531/86	145
5:30 - 5:45 PM	24/2	1/0	13/1	10/4	16/2	7/1	6/0	20/1	359/58	627/96	154
5:45 - 6:00 PM	29/5	1/0	13/0	13/3	16/2	9/2	6/0	21/1	461/51	641/67	138

17 0 6 10 12 4 3 9 218 354

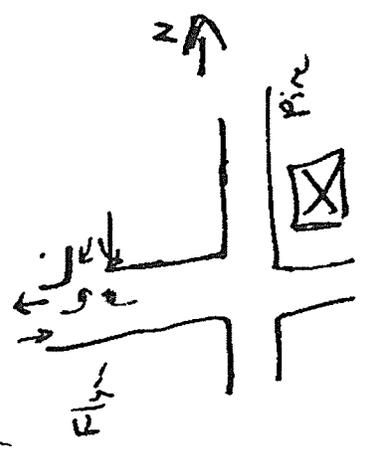
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Flynn Ave. Development - Traffic Counts AM (7AM - 9AM)
 Date: 6/1/2016 Done By: G. BURGMEIER

Time Slot	Flynn Ave. Development Drive		Flynn Ave Through traffic		TOTAL COUNT
	In	Out	West Bound To Foster	East Bound To SE	
7:00 - 7:15 AM	0	0	19	24	43
7:15 - 7:30 AM	1/1	2/2	60/41	36/12	53
7:30 - 7:45 AM	0/0	3/1	100/40	51/15	55
7:45 - 8:00 AM	2/1	4/1	167/67	85/34	111
8:00 - 8:15 AM	3/1	5/1	228/61	121/36	97
8:15 - 8:30 AM	3/0	6/1	208/60	141/20	80
8:30 - 8:45 AM	4/1	8/2	349/61	159/18	79
8:45 - 9:00 AM	4/0	9/1	409/60	188/29	49

#/#
 TOTAL COUNT
 DEDUCTED
 INTERVAL
 COUNT

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* NOTE: 30-40% OF WESTBOUND TRAFFIC W/AS FROM LT TURNS OFF OF FOSTER STREET

8:00-6 parked
 8:03-6 parked
 8:05-8 parked
 8:06 9 parked
 8:08 9 parked

busses: Champlain College
 CCTA
 MT Transit
 730 CCTA School Buses

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Pine Street Development - Traffic Counts AM
 Date: 6/11/19 Done By: Nora Varhue

Time Slot	Pine Street Development Drive				Pine Street Through traffic	
	In	Out	In	Out	North Bound	West Bound
7:00 - 7:15 AM	1	1	1	1	69 CT 1 B 2 P: 2	106 CT 2 B 5 P: 4
7:15 - 7:30 AM	2	2	1	1	95 CT 5 B 3 P: 6	96 CT 8 B 5 P: 4
7:30 - 7:45 AM	3	7	2	7	112 CT 5 B 4 P: 2	141 CT 1 B 1 P: 7
7:45 - 8:00 AM	4	2	0	1	113 CT 4 B 3 P: 2	196 CT 1 B 1 P: 2
8:00 - 8:15 AM	1	0	1	1	98 CT 3 B 3 P: 3	213 CT 2 B 4 P: 5
8:15 - 8:30 AM	3	1	0	1	90 CT 4 B 6 P: 5	183 CT 1 B 9 P: 11
8:30 - 8:45 AM	11	5	0	1	111 CT 7 B 7 P: 4	162 CT 2 B 1 P: 6
8:45 - 9:00 AM	7	4	0	3	126 CT 3 B 6 P: 3	198 CT 4 B 2 P: 3

175

191

253

309

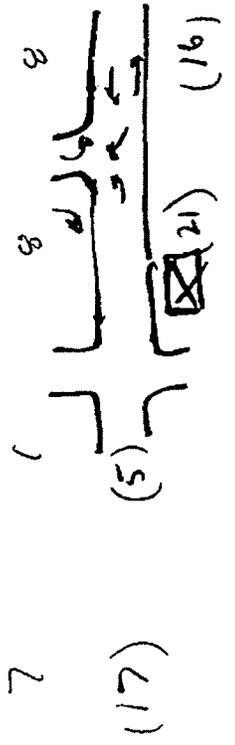
311

273

277

324

425 752



8-9

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Pine Street Deli - Parking Count

Date: 6/7 Done By: Glen

Peak

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	Time Slot	Number of spaces	Number of Parked Cars
Pine Street Deli	11:30 AM	22 (6) DIRT	11
	12:00 PM		8
	12:30 PM		15
	1:00 PM		12
	1:30 PM		13

15

Date: 6/7 Done By: Glen

	Time Slot	Number of spaces	Number of Parked Cars
Flynn Ave. Development Lot	11:30 AM	42	14
	12:00 PM		10
	12:30 PM		10
	1:00 PM		11
	1:30 PM		13

14

Date: 6/7 Done By: Glen

	Time Slot	Number of spaces	Number of Parked Cars
Pine Street Development Lot	11:30 AM	84	33 33
	12:00 PM		38
	12:30 PM		39
	1:00 PM		40
	1:30 PM		41

41

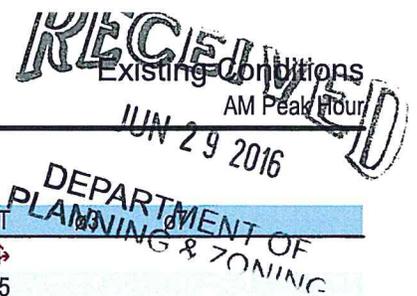
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**Intersection Capacity
Analysis Worksheets**

Queues
3: Pine Street & Flynn Avenue



	↗	→	↖	←	↙	↑	↘	↓		
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT		
Lane Configurations		↔		↔		↔	↖	↗		
Traffic Volume (vph)	40	65	15	100	10	415	105	365		
Future Volume (vph)	40	65	15	100	10	415	105	365		
Lane Group Flow (vph)	0	120	0	365	0	440	105	440		
Turn Type	Perm	NA	Perm	NA	Perm	NA	pm+pt	NA		
Protected Phases		4		8		2	1	6	3	7
Permitted Phases	4		8		2		6			
Detector Phase	4	4	8	8	2	2	1	6		
Switch Phase										
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	18.0	18.0	18.0	18.0	23.0	23.0	10.0	18.0	6.0	6.0
Total Split (s)	23.0	23.0	23.0	23.0	27.0	27.0	10.0	37.0	6.0	6.0
Total Split (%)	34.8%	34.8%	34.8%	34.8%	40.9%	40.9%	15.2%	56.1%	9%	9%
Maximum Green (s)	17.0	17.0	17.0	17.0	21.0	21.0	4.0	31.0	4.0	4.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	2.0	2.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.0	0.0
Lost Time Adjust (s)		0.0		0.0		0.0		0.0		
Total Lost Time (s)		6.0		6.0		6.0		6.0		
Lead/Lag	Lag	Lag	Lag	Lag	Lag	Lag	Lead		Lead	Lead
Lead-Lag Optimize?	Yes		Yes	Yes						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	Min	Min	None	Min	None	None
Walk Time (s)									2.0	2.0
Flash Dont Walk (s)									2.0	2.0
Pedestrian Calls (#/hr)									5	5
Act Effct Green (s)		13.4		13.4		17.1	24.4	24.4		
Actuated g/C Ratio		0.26		0.26		0.33	0.47	0.47		
v/c Ratio		0.45		0.76		0.73	0.31	0.54		
Control Delay		23.4		23.9		25.9	10.9	12.6		
Queue Delay		0.0		0.0		0.0	0.0	0.0		
Total Delay		23.4		23.9		25.9	10.9	12.6		
LOS		C		C		C	B	B		
Approach Delay		23.4		23.9		25.9		12.2		
Approach LOS		C		C		C		B		
Queue Length 50th (ft)		30		59		126	17	83		
Queue Length 95th (ft)		84		#204		#289	47	191		
Internal Link Dist (ft)		397		21		284		90		
Turn Bay Length (ft)										
Base Capacity (vph)		370		604		810	339	1087		
Starvation Cap Reductn		0		0		0	0	0		
Spillback Cap Reductn		0		0		0	0	0		
Storage Cap Reductn		0		0		0	0	0		
Reduced v/c Ratio		0.32		0.60		0.54	0.31	0.40		

Intersection Summary

Cycle Length: 66
 Actuated Cycle Length: 51.9
 Natural Cycle: 60
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.76

Queues
 3: Pine Street & Flynn Avenue

Existing Conditions
 AM Peak Hour

Intersection Signal Delay: 20.1
 Intersection Capacity Utilization 85.4%
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Intersection LOS: C
 ICU Level of Service E

Splits and Phases: 3: Pine Street & Flynn Avenue

↙ ρ1 10 s	↑ ρ2 27 s	↘ ρ3 6 s	→ ρ4 23 s
↓ ρ6 37 s		↙ ρ7 6 s	← ρ8 23 s

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HCM Signalized Intersection Capacity Analysis
3: Pine Street & Flynn Avenue

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Existing Conditions
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕		↕	↕	
Traffic Volume (vph)	40	65	15	15	100	250	10	415	15	105	365	75
Future Volume (vph)	40	65	15	15	100	250	10	415	15	105	365	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.0		6.0	6.0	
Lane Util. Factor		1.00			1.00			1.00		1.00	1.00	
Frb, ped/bikes		1.00			0.97			1.00		1.00	0.99	
Flpb, ped/bikes		1.00			1.00			1.00		1.00	1.00	
Frt		0.98			0.91			1.00		1.00	0.97	
Flt Protected		0.98			1.00			1.00		0.95	1.00	
Satd. Flow (prot)		1413			1417			1850		1667	1703	
Flt Permitted		0.71			0.98			0.99		0.29	1.00	
Satd. Flow (perm)		1013			1397			1824		517	1703	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	40	65	15	15	100	250	10	415	15	105	365	75
RTOR Reduction (vph)	0	8	0	0	120	0	0	2	0	0	11	0
Lane Group Flow (vph)	0	112	0	0	245	0	0	438	0	105	429	0
Confl. Peds. (#/hr)	10		5	7		12	5		7	12		10
Heavy Vehicles (%)	13%	13%	13%	3%	3%	3%	2%	2%	2%	6%	6%	6%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	5	5	5
Parking (#/hr)	5	5	5	5	5	5						
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		13.4			13.4			17.1		26.0	26.0	
Effective Green, g (s)		13.4			13.4			17.1		26.0	26.0	
Actuated g/C Ratio		0.25			0.25			0.32		0.48	0.48	
Clearance Time (s)		6.0			6.0			6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)		251			346			577		310	819	
v/s Ratio Prot										0.02	c0.25	
v/s Ratio Perm		0.11			c0.18			c0.24		0.14		
v/c Ratio		0.45			0.71			0.76		0.34	0.52	
Uniform Delay, d1		17.2			18.5			16.6		9.7	9.7	
Progression Factor		1.00			1.00			1.00		1.00	1.00	
Incremental Delay, d2		1.3			6.5			5.7		0.7	0.6	
Delay (s)		18.4			25.0			22.3		10.3	10.3	
Level of Service		B			C			C		B	B	
Approach Delay (s)		18.4			25.0			22.3			10.3	
Approach LOS		B			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	18.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	54.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	85.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Queues
3: Pine Street & Flynn Avenue

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BUILDING CONDITIONS
AM Peak Hour

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Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT		
Lane Configurations		↕		↕		↕	↕	↕		
Traffic Volume (vph)	40	65	15	100	10	415	106	366		
Future Volume (vph)	40	65	15	100	10	415	106	366		
Lane Group Flow (vph)	0	120	0	365	0	440	106	441		
Turn Type	Perm	NA	Perm	NA	Perm	NA	pm+pt	NA		
Protected Phases		4		8		2	1	6	3	7
Permitted Phases	4		8		2		6			
Detector Phase	4	4	8	8	2	2	1	6		
Switch Phase										
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	18.0	18.0	18.0	18.0	23.0	23.0	10.0	18.0	6.0	6.0
Total Split (s)	23.0	23.0	23.0	23.0	27.0	27.0	10.0	37.0	6.0	6.0
Total Split (%)	34.8%	34.8%	34.8%	34.8%	40.9%	40.9%	15.2%	56.1%	9%	9%
Maximum Green (s)	17.0	17.0	17.0	17.0	21.0	21.0	4.0	31.0	4.0	4.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	2.0	2.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.0	0.0
Lost Time Adjust (s)		0.0		0.0		0.0	0.0	0.0		
Total Lost Time (s)		6.0		6.0		6.0	6.0	6.0		
Lead/Lag	Lag	Lag	Lag	Lag	Lag	Lag	Lead		Lead	Lead
Lead-Lag Optimize?	Yes		Yes	Yes						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	Min	Min	None	Min	None	None
Walk Time (s)									2.0	2.0
Flash Dont Walk (s)									2.0	2.0
Pedestrian Calls (#/hr)									5	5
Act Effct Green (s)		13.4		13.4		17.1	24.4	24.4		
Actuated g/C Ratio		0.26		0.26		0.33	0.47	0.47		
v/c Ratio		0.45		0.76		0.73	0.31	0.54		
Control Delay		23.4		23.9		25.9	10.9	12.6		
Queue Delay		0.0		0.0		0.0	0.0	0.0		
Total Delay		23.4		23.9		25.9	10.9	12.6		
LOS		C		C		C	B	B		
Approach Delay		23.4		23.9		25.9		12.3		
Approach LOS		C		C		C		B		
Queue Length 50th (ft)		30		59		126	17	83		
Queue Length 95th (ft)		84		#204		#289	48	191		
Internal Link Dist (ft)		397		21		284		90		
Turn Bay Length (ft)										
Base Capacity (vph)		370		604		810	339	1087		
Starvation Cap Reductn		0		0		0	0	0		
Spillback Cap Reductn		0		0		0	0	0		
Storage Cap Reductn		0		0		0	0	0		
Reduced v/c Ratio		0.32		0.60		0.54	0.31	0.41		

Intersection Summary

Cycle Length: 66
 Actuated Cycle Length: 51.9
 Natural Cycle: 60
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.76

Queues

3: Pine Street & Flynn Avenue

Build Conditions

AM Peak Hour

Intersection Signal Delay: 20.1

Intersection LOS: C

Intersection Capacity Utilization 85.5%

ICU Level of Service E

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 3: Pine Street & Flynn Avenue

↙ ρ1 10 s	↖ ρ2 27 s	↗ ρ3 6 s	→ ρ4 23 s
↓ ρ6 37 s		↘ ρ7 6 s	← ρ8 23 s

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HCM Signalized Intersection Capacity Analysis
3: Pine Street & Flynn Avenue

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Build Conditions
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕		↕	↕	
Traffic Volume (vph)	40	65	15	15	100	250	10	415	15	106	366	75
Future Volume (vph)	40	65	15	15	100	250	10	415	15	106	366	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.0		6.0	6.0	
Lane Util. Factor		1.00			1.00			1.00		1.00	1.00	
Frb, ped/bikes		1.00			0.97			1.00		1.00	0.99	
Flpb, ped/bikes		1.00			1.00			1.00		1.00	1.00	
Frft		0.98			0.91			1.00		1.00	0.97	
Flt Protected		0.98			1.00			1.00		0.95	1.00	
Satd. Flow (prot)		1413			1417			1850		1667	1703	
Flt Permitted		0.71			0.98			0.98		0.29	1.00	
Satd. Flow (perm)		1013			1397			1824		517	1703	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	40	65	15	15	100	250	10	415	15	106	366	75
RTOR Reduction (vph)	0	8	0	0	120	0	0	2	0	0	11	0
Lane Group Flow (vph)	0	112	0	0	245	0	0	438	0	106	430	0
Confl. Peds. (#/hr)	10		5	7		12	5		7	12		10
Heavy Vehicles (%)	13%	13%	13%	3%	3%	3%	2%	2%	2%	6%	6%	6%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	5	5	5
Parking (#/hr)	5	5	5	5	5	5						
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		13.4			13.4			17.1		26.0	26.0	
Effective Green, g (s)		13.4			13.4			17.1		26.0	26.0	
Actuated g/C Ratio		0.25			0.25			0.32		0.48	0.48	
Clearance Time (s)		6.0			6.0			6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)		251			346			577		310	819	
v/s Ratio Prot										0.02	c0.25	
v/s Ratio Perm		0.11			c0.18			c0.24		0.15		
v/c Ratio		0.45			0.71			0.76		0.34	0.53	
Uniform Delay, d1		17.2			18.5			16.6		9.7	9.7	
Progression Factor		1.00			1.00			1.00		1.00	1.00	
Incremental Delay, d2		1.3			6.5			5.7		0.7	0.6	
Delay (s)		18.4			25.0			22.3		10.4	10.3	
Level of Service		B			C			C		B	B	
Approach Delay (s)		18.4			25.0			22.3			10.3	
Approach LOS		B			C			C			B	

Intersection Summary		
HCM 2000 Control Delay	18.2	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.76	B
Actuated Cycle Length (s)	54.0	Sum of lost time (s)
Intersection Capacity Utilization	85.5%	20.0
Analysis Period (min)	15	ICU Level of Service
c Critical Lane Group		E

Queues
3: Pine Street & Flynn Avenue

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Existing Conditions
PM Peak Hour

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Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	ø3	ø7
Lane Configurations		↕		↕		↕	↕	↕		
Traffic Volume (vph)	60	115	30	85	10	345	265	660		
Future Volume (vph)	60	115	30	85	10	345	265	660		
Lane Group Flow (vph)	0	195	0	260	0	385	265	750		
Turn Type	Perm	NA	Perm	NA	Perm	NA	pm+pt	NA		
Protected Phases		4		8		2	1	6	3	7
Permitted Phases	4		8		2		6			
Detector Phase	4	4	8	8	2	2	1	6		
Switch Phase										
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	18.0	18.0	18.0	18.0	23.0	23.0	10.0	18.0	6.0	6.0
Total Split (s)	20.0	20.0	20.0	20.0	28.0	28.0	12.0	40.0	6.0	6.0
Total Split (%)	30.3%	30.3%	30.3%	30.3%	42.4%	42.4%	18.2%	60.6%	9%	9%
Maximum Green (s)	14.0	14.0	14.0	14.0	22.0	22.0	6.0	34.0	4.0	4.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	2.0	2.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.0	0.0
Lost Time Adjust (s)		0.0		0.0		0.0	0.0	0.0		
Total Lost Time (s)		6.0		6.0		6.0	6.0	6.0		
Lead/Lag	Lag	Lag	Lag	Lag	Lag	Lag	Lead		Lead	Lead
Lead-Lag Optimize?	Yes		Yes	Yes						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	Min	Min	None	Min	None	None
Walk Time (s)									2.0	2.0
Flash Dont Walk (s)									2.0	2.0
Pedestrian Calls (#/hr)									5	5
Act Effct Green (s)		12.8		12.8		16.6	28.9	28.9		
Actuated g/C Ratio		0.23		0.23		0.30	0.53	0.53		
v/c Ratio		0.67		0.70		0.71	0.62	0.79		
Control Delay		34.9		27.2		25.2	15.9	19.1		
Queue Delay		0.0		0.0		0.0	0.0	0.0		
Total Delay		34.9		27.2		25.2	15.9	19.1		
LOS		C		C		C	B	B		
Approach Delay		34.9		27.2		25.2		18.2		
Approach LOS		C		C		C		B		
Queue Length 50th (ft)		54		49		107	44	175		
Queue Length 95th (ft)		#169		#175		214	#108	#439		
Internal Link Dist (ft)		397		21		284		90		
Turn Bay Length (ft)										
Base Capacity (vph)		323		403		728	429	1133		
Starvation Cap Reductn		0		0		0	0	0		
Spillback Cap Reductn		0		0		0	0	0		
Storage Cap Reductn		0		0		0	0	0		
Reduced v/c Ratio		0.60		0.65		0.53	0.62	0.66		

Intersection Summary

Cycle Length: 66
 Actuated Cycle Length: 54.9
 Natural Cycle: 60
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.79

Queues

3: Pine Street & Flynn Avenue

Existing Conditions

PM Peak Hour

Intersection Signal Delay: 22.7

Intersection LOS: C

Intersection Capacity Utilization 98.3%

ICU Level of Service F

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 3: Pine Street & Flynn Avenue

↙ ρ1 12 s	↑ ρ2 28 s	↘ ρ3 6 s	→ ρ4 20 s
↓ ρ6 40 s		↙ ρ7 6 s	← ρ8 20 s

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DEPARTMENT OF
PLANNING & ZONING

HCM Signalized Intersection Capacity Analysis
3: Pine Street & Flynn Avenue

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Existing Conditions
PM Peak Hour
JUN 29 2015
DEPARTMENT OF TRANSPORTATION
PLANNING

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔		↔	↔	
Traffic Volume (vph)	60	115	20	30	85	145	10	345	30	265	660	90
Future Volume (vph)	60	115	20	30	85	145	10	345	30	265	660	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.0		6.0	6.0	
Lane Util. Factor		1.00			1.00			1.00		1.00	1.00	
Frb, ped/bikes		0.99			0.96			1.00		1.00	0.99	
Flpb, ped/bikes		0.99			1.00			1.00		1.00	1.00	
Frt		0.99			0.92			0.99		1.00	0.98	
Flt Protected		0.98			0.99			1.00		0.95	1.00	
Satd. Flow (prot)		1559			1370			1817		1729	1783	
Flt Permitted		0.77			0.95			0.97		0.32	1.00	
Satd. Flow (perm)		1217			1304			1768		574	1783	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	60	115	20	30	85	145	10	345	30	265	660	90
RTOR Reduction (vph)	0	6	0	0	67	0	0	5	0	0	7	0
Lane Group Flow (vph)	0	189	0	0	193	0	0	380	0	265	743	0
Confl. Peds. (#/hr)	26		14	11		23	14		11	23		26
Heavy Vehicles (%)	2%	2%	2%	7%	7%	7%	3%	3%	3%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	5	5	5
Parking (#/hr)	5	5	5	5	5	5						
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		12.8			12.8			16.8		28.9	28.9	
Effective Green, g (s)		12.8			12.8			16.8		28.9	28.9	
Actuated g/C Ratio		0.23			0.23			0.30		0.51	0.51	
Clearance Time (s)		6.0			6.0			6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)		276			295			526		419	913	
v/s Ratio Prot										0.07	c0.42	
v/s Ratio Perm		c0.16			0.15			0.21		0.26		
v/c Ratio		0.68			0.65			0.72		0.63	0.81	
Uniform Delay, d1		19.9			19.8			17.7		9.9	11.5	
Progression Factor		1.00			1.00			1.00		1.00	1.00	
Incremental Delay, d2		6.8			5.1			4.9		3.1	5.6	
Delay (s)		26.8			24.9			22.6		13.0	17.1	
Level of Service		C			C			C		B	B	
Approach Delay (s)		26.8			24.9			22.6			16.0	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	19.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	56.4	Sum of lost time (s)	20.0
Intersection Capacity Utilization	98.3%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Queues
3: Pine Street & Flynn Avenue

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	↗	→	↘	←	↖	↑	↙	↓		
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	ø3	ø7
Lane Configurations		↕		↕		↕	↗	↘		
Traffic Volume (vph)	60	115	30	85	10	346	265	660		
Future Volume (vph)	60	115	30	85	10	346	265	660		
Lane Group Flow (vph)	0	195	0	260	0	386	265	750		
Turn Type	Perm	NA	Perm	NA	Perm	NA	pm+pt	NA		
Protected Phases		4		8		2	1	6	3	7
Permitted Phases	4		8		2		6			
Detector Phase	4	4	8	8	2	2	1	6		
Switch Phase										
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	18.0	18.0	18.0	18.0	23.0	23.0	10.0	18.0	6.0	6.0
Total Split (s)	20.0	20.0	20.0	20.0	28.0	28.0	12.0	40.0	6.0	6.0
Total Split (%)	30.3%	30.3%	30.3%	30.3%	42.4%	42.4%	18.2%	60.6%	9%	9%
Maximum Green (s)	14.0	14.0	14.0	14.0	22.0	22.0	6.0	34.0	4.0	4.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	2.0	2.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.0	0.0
Lost Time Adjust (s)		0.0		0.0		0.0		0.0		
Total Lost Time (s)		6.0		6.0		6.0		6.0		
Lead/Lag	Lag	Lag	Lag	Lag	Lag	Lag	Lead		Lead	Lead
Lead-Lag Optimize?	Yes		Yes	Yes						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	Min	Min	None	Min	None	None
Walk Time (s)									2.0	2.0
Flash Dont Walk (s)									2.0	2.0
Pedestrian Calls (#/hr)									5	5
Act Effct Green (s)		12.8		12.8		16.6	28.9	28.9		
Actuated g/C Ratio		0.23		0.23		0.30	0.53	0.53		
v/c Ratio		0.67		0.70		0.71	0.62	0.79		
Control Delay		34.9		27.2		25.3	15.9	19.1		
Queue Delay		0.0		0.0		0.0	0.0	0.0		
Total Delay		34.9		27.2		25.3	15.9	19.1		
LOS		C		C		C	B	B		
Approach Delay		34.9		27.2		25.3		18.2		
Approach LOS		C		C		C		B		
Queue Length 50th (ft)		54		49		107	44	175		
Queue Length 95th (ft)		#169		#175		215	#108	#439		
Internal Link Dist (ft)		397		21		284		90		
Turn Bay Length (ft)										
Base Capacity (vph)		323		403		728	429	1133		
Starvation Cap Reductn		0		0		0	0	0		
Spillback Cap Reductn		0		0		0	0	0		
Storage Cap Reductn		0		0		0	0	0		
Reduced v/c Ratio		0.60		0.65		0.53	0.62	0.66		

Intersection Summary

Cycle Length: 66
 Actuated Cycle Length: 54.9
 Natural Cycle: 60
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.79

Intersection Signal Delay: 22.7

Intersection LOS: C

Intersection Capacity Utilization 98.3%

ICU Level of Service F

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 3: Pine Street & Flynn Avenue

↙ ρ1 12 s	↑ ρ2 28 s	↘ ρ3 6 s	→ ρ4 20 s
↓ ρ6 40 s		↙ ρ7 6 s	← ρ8 20 s

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Lane Util. Factor		1.00			1.00			1.00		1.00	
Frb, ped/bikes		0.99			0.96			1.00		1.00	0.99
Flpb, ped/bikes		0.99			1.00			1.00		1.00	1.00
Fr		0.99			0.92			0.99		1.00	0.98
Flt Protected		0.98			0.99			1.00		0.95	1.00
Satd. Flow (prot)		1559			1370			1817		1729	1783
Flt Permitted		0.77			0.95			0.97		0.31	1.00
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Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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Heavy Vehicles (%)	2%	2%	2%	7%	7%	7%	3%	3%	3%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	5	5
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