Summarized

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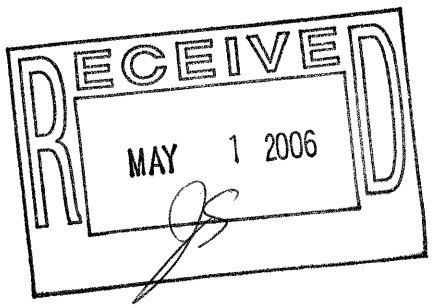
Ref: 4452

April 28, 2006



Mr. Jay Szklut
Planning and Economic Development Manager
Office of Community Development
19 Moore Street
Belmont, MA 02478

Re: The Residences at Acorn Park
Belmont, Massachusetts

Dear Mr. Szklutz:

Vanasse & Associates, Inc. (VAI) is providing detailed responses to the comments raised in the March 16, 2006 memorandum prepared by The BSC Group (BSC) with regard to their review of the January 2006 Traffic Impact and Access Study (TIAS) prepared by VAI in support of The Residences at Acorn Park to be located off Acorn Park Drive in Belmont, Massachusetts. Listed below are each of the comments raised in BSC's letter followed by our detailed response.

Comment: "**Existing Conditions** – The status of Acorn Park Drive as a public roadway or private way is not clear from the submission. This is important because it could affect such considerations such as pedestrian access, and the routes for trip distribution."

Response: Acorn Park Drive is a private roadway that is owned by the proponent within the Town of Belmont and is a public roadway within the City of Cambridge. Rights to pass and repass for vehicular and pedestrian access are provided.

Comment: "**Existing Traffic Volumes** – A comparison between traffic data obtained in 2001 and 2005 for Frontage Road/Acorn Park Drive shows a significant reduction in the number of vehicles turning right from Frontage Road onto Acorn Park Drive during the morning peak hour. Is this due to current vacancies in the Acorn park area and were these taken into account in the study?"

Response: The reduction in the existing traffic volumes for Frontage Road/Acorn Park Drive is due in part to current vacancies in the Acorn Park Drive area. Under 2010 No-Build and Build conditions, it was assumed that the current vacant space would be reoccupied in conjunction with the Cambridge Discovery Park project.

Comment: "**Motor Vehicle Crash Data** – The report indicates that the crash rate data at the intersection of Acorn Park Drive/Frontage Road has a motor vehicle crash rate (1.05) that exceeds the average MassHighway crash rate for District 4 (0.87), which includes the Town of Belmont. This intersection provides the primary access to the proposed project site. A detailed evaluation of the safety of this

intersection is needed to identify the cause of the high crash rate, and if possible, recommend the necessary remedial action."

Response: A detailed motor vehicle crash analysis has been completed for the intersection of Acorn Park Drive at Frontage Road based on data provided by the Town of Belmont Police Department for the most recent three-year period available (2003 through 2005). Two motor vehicle crashes were reported at the intersection, one in 2003 and one in 2004, with no reported motor vehicle crashes in 2005. Both reported crashes involved a single motor vehicle that stuck a fixed object, in one instance a snow pile. Based on a review of this data and discussions with the Town of Belmont Police Department, no roadway or intersection safety deficiencies were readily apparent that are directly attributable to the cause of the two reported motor vehicle collisions at this intersection.

In conjunction with the proposed project, the proponent will upgrade the existing traffic signal equipment, timing and phasing as necessary in order to accommodate pedestrian and bicycle access to the project site. These improvements will include upgraded and enhanced signs and pavement markings at the intersection, all of which will improve vehicular and pedestrian circulation and safety.

Comment: "**Existing Public Transportation System** – The proposed project site is located within a quarter of a mile of the MBTA Alewife Station, which is the terminal for a number of bus routes, and the Red Line subway as discussed in the traffic report. A bicycle lane is marked on the shoulder of Acorn Park Drive. Connections to the bus terminal and the pedestrian paths in the area should be clearly shown on a map and any safety deficiencies identified. The proponent should also show the locations of existing bus stops with the bus route identified in the vicinity of the project site."

Response: Figure 1 depicts the location of existing bus stops, pedestrian and bicycle facilities in the vicinity of the project site and within the immediate study area. In order to facilitate pedestrian access between the project site, Frontage Road and the MBTA's Alewife Station on the Red Line, subject to the availability of right-of-way and receipt of the necessary approvals, the proponent will construct the missing segment of sidewalk between Frontage Road and the existing sidewalk along the south (east) side of Acorn Park Drive. With the completion of the missing segment of sidewalk, a dedicated, safe pedestrian connection will be provided between Alewife Station and Acorn Park Drive/Frontage Road/Lake Street. Additionally, as described previously, the proponent will upgrade the existing traffic signal equipment, timing and phasing at the intersection of Acorn Park Drive at Frontage Road and the Route 2 eastbound off-ramp as necessary in order to accommodate pedestrian and bicycle access to the project site.

Comment: "**Background Traffic** – The traffic report contained information on specific development projects by others that would impact traffic in the study area as well as general traffic growth. Proposed roadway improvements on the local roadway

network are also included in the report. There is however, no mention of the on-going reconstruction of the entire length of Pleasant Street including two of the intersections being studied."

Response: Pleasant Street is being reconstructed as a part of a joint Town of Belmont/Massachusetts Highway Department project. The reconstruction project involves the full depth reconstruction of the segment of Pleasant Street between the Arlington Town Line and Trapelo Road, and includes reconstruction of existing sidewalks, replacement and upgrading of the existing drainage system, streetscape enhancements, and the installation of signs and pavement markings. In addition, the existing traffic signal systems at the intersections of Pleasant Street at Brighton Street, Pleasant Street at Clifton Street and Pleasant Street at Concord Avenue will be reconstructed. The Pleasant Street improvement project is currently under construction and is anticipated to be complete in the Autumn of 2006.

Comment: "**Trip Generation** – Standard data published by the Institute of Transportation Engineers (ITE) was used to determine the number of trips that would be generated by the proposed residential development. The report assumes 95 percent of the trips from the site would be by automobiles with the rest using other means of transportation such as public transit, walking or bicycling. With the proximity of the project to public transit, BSC concurs that the automobile trips appear to be conservative."

Response: No response necessary. BSC and VAI are in agreement.

Comment: "**Trip Distribution** – The report states that the directional distribution of project trips was based on 2000 US Census journey to work data in addition to existing traffic patterns within the area. While BSC concurs with this methodology in general, the specific route assignment should take into consideration travel times between points in the roadway network. It appears that a high proportion (28% out of 32%) of those traveling on Route 2 east from the site are using Acorn Park Drive onto the Alewife Station off-ramp and through the access roads in the vicinity of the Alewife MBTA station before turning onto Alewife Brook Parkway. Traffic congestion experienced in the Alewife area tends to impact all of the area roadways during the peak hours offering little advantage of one travel route over another. Therefore we expect approximately equal percentages to exit via the signalized intersection of Acorn Park Drive and Frontage Road/Route 2 on ramp, and Acorn Park Drive/Alewife Station Off Ramp. Also, it is not clear from the report if Acorn Park Drive is a public or private way. What would be the implications for the trip distribution assumptions if Acorn Park Drive were a private roadway and might be closed to through traffic?"

Response: The trip distribution pattern for the project was developed based in part on a review of existing travel patterns within the study area which accounts for variations and trip patterns that may occur as a result of congestion and delays at specific points along the roadway network. That said, any deviations are

expected to be relatively minor and would not materially impact the conclusions and recommendations presented in the TIAS.

As stated previously, Acorn Park Drive is a private roadway that is owned by the proponent within the Town of Belmont and is a public roadway within the City of Cambridge. Rights to pass and repass for vehicular and pedestrian access are provided. As such, it is unlikely that Acorn Park Drive would be closed to through traffic and can not be closed to project-related traffic.

Comment: "**Traffic Operation Analysis** – As mentioned earlier, Pleasant Street is under construction and the lane configuration and signal phasing used in the VAI traffic study for the Brighton Street westbound approach at Pleasant Street is incorrect. A separate right-turn lane does not exist today nor would it be in the future that would permit a formal overlapping phase. Right turning traffic on Brighton Street would be able [to] make "right-turn on red" except during the pedestrian phase. The analysis should be revised to reflect the proposed lane and signal configuration for this intersection."

Response: Field observations during the peak periods indicate that the Brighton Street approach functions as two travel lanes, providing a functional left-turn/through travel lane and a right-turn lane. This configuration allows for right-turn-on-red operation, which was observed to accommodate approximately 50 percent of right-turning traffic during each signal phase. The traffic operations analysis for the intersection has been revised in order to eliminate the right-turn overlap phase and incorporate right-turn-on-red operations. The revised analysis results are summarized in Table 15R, with changes to the analysis results from those presented in Table 15 of the TIAS shaded for reference.

As can be seen in Table 15R, the intersection of Pleasant Street at Brighton Street was shown to operate at an overall level-of-service of C or better during the peak periods under all analysis conditions (Existing, No-Build and Build), with no changes in level-of-service shown to occur over No-Build conditions with the addition of project-related traffic. The detailed analysis worksheets are attached.

Comment: "Brighton Street at Cross Street was recently reconstructed, and the applicant should verify that the roadway widths and the signal timing/phasing used in the report are accurate."

Response: VAI has verified that the roadway widths and the traffic signal timing at the intersection of Brighton Street at Cross Street as presented in the TIAS are accurate and reflect current (April 2006) conditions at the intersection.

Comment: "The traffic report assumes that planned improvements at several of the study area intersections by the Cambridge Discovery Park project would be in place under the future No-Build and Build conditions. The proponent should commit to making these improvements if they are not put [in] place by Cambridge Discovery Park prior to the issuance of the Certificate of Occupancy."

Response: The proponent will commit to completing the improvements at the study intersections identified in the TIAS that are listed as to be completed in conjunction with the Cambridge Discovery Park project should the Cambridge Discovery Park project fail to commence constriction or the listed improvements not be completed within one year of the issuance of Certificate of Occupancy for the project.

Comment: "**Proposed Mitigation** – The creation of a new ramp off of Route 2 eastbound with direct access to Acorn Park Drive was proposed in the 2003 Draft Environmental Impact Report (DEIR) filed with the Massachusetts Environmental Protection Act, under the previous office/R&D proposal for the project site. Under the proposal, vehicles would predominantly employ Route 2 as the primary access/egress to the site. The creation of a direct connection from the existing Route 2 eastbound off-ramp to Acorn Park Drive should significantly reduce traffic on Lake Street. This connection was not mentioned in the current report for the residential development. BSC recommends that the Town and the proponent should consider pursuing the construction of this new access ramp."

Response: The creation of a direction connection between Route 2 eastbound and Acorn Park Drive is not proposed as a part of the residential development nor does it appear that such a connection is necessary in order to accommodate the relatively small number of vehicles projected to access the development from Route 2 eastbound (between 5 and 18 vehicles during the peak periods). This connection would serve to mitigate existing traffic along Lake Street which is not the responsibility of the proponent. Further, the proposed residential development represents a significant reduction in traffic volumes over the previous office/R&D development proposal. As presented in the TIAS, average weekday traffic volumes are expected to be reduced by approximately 26 percent, with weekday peak hour traffic volumes reduced by up to 60 percent. As such, the proposed residential development does not require the same level of improvements to the transportation infrastructure that were necessary to accommodate the prior office/R&D development proposal.

Comment: "Improvements at the Brighton Street and Cross Road intersection should include bicycle accommodation on all the approaches."

Response: The proponent has committed to providing an optimal traffic signal timing and phasing plan at the intersection of Brighton Street at Cross Street. The design of the timing and phasing plan will accommodate pedestrian and bicycle travel at the intersection in a safe and efficient manner.

Comment: "Traffic operations at the intersection of Cross Street and Lake Street currently operate at level of Service F and are expected to be worse in the future build condition if no mitigation measures are implemented. During the earlier review process, it was determined that traffic signals may be warranted at this location and that further discussions would be pursued with the Town and other parties due to the potential for additional cut-through traffic. The proponent and the

Town should continue to investigate the traffic signalization at this intersection since traffic operations are expected to worsen in the future."

Response: As presented in the TIAS, proponent is committed to the development of a comprehensive mitigation program that is designed to minimize the impacts of the project and will continue to work with the Town to develop measures to improve traffic operations at the intersection of Lake Street at Cross Street. As an interim improvement and as previously discussed with the Town, the proponent will restripe the Cross Street northbound approach to provide separate left and right-turn lanes approaching Lake Street. These improvements will be implemented prior to the issuance of a Certificate of Occupancy for the project.

Comment: "The traffic study contains a number of Transportation Demand Management (TDM) measures designed to reduce the number of single occupancy vehicles. While the proponent should be commended for these commitments, more detailed information should be provided to the Town. One of the commitments is to provide shuttle bus/van service between the site and the MBTA's Alewife Station. More information on the frequency and cost to the residents, if it is not a free service, should be provided to the Town for their review. In addition, more specifics should be provided with regards to what the study calls a "safe and inviting pedestrian environment: on site and in front of the site."

Response: The planned shuttle service will be provided as a free service to residents and employees of the project. The schedule of operation of the shuttle service will be developed to meet the needs of employees and residents of the project and will be designed in part around the service schedule for Red Line service to Alewife Station.

The pedestrian environmental along the project frontage on Acorn Park Drive and within the site will consist of sidewalks that will separate pedestrian and vehicular traffic, with lighting provided in order to facilitate use under low light conditions. Wheelchair ramps will be provided at pedestrian crossing locations as appropriate.

As presented herein and discussed in the TIAS, the proponent will construct a sidewalk along the project frontage that will link the project site to the existing sidewalk along south side of Frontage Road and the traffic signal at the intersection of Acorn Park Drive at Frontage Road and the Route 2 eastbound off-ramp. Further, subject to the availability of right-of-way and receipt of the necessary approvals, the proponent will construct the missing segment of sidewalk between the project site and the existing sidewalk along the south (east) side of Acorn Park Drive. With the completion of the missing segment of sidewalk, a dedicated, safe pedestrian connection will be provided between Alewife Station and Acorn Park Drive/Frontage Road/Lake Street. Additionally, the proponent will upgrade the existing traffic signal equipment, timing and phasing at the intersection of Acorn Park Drive at Frontage Road and the Route 2 eastbound off-ramp as necessary in order to accommodate pedestrian and bicycle access to the project site.

Comment: "As part of the reconstruction of Pleasant Street, emergency vehicle preemption systems are to be installed at each of the signalized intersections. The proponent should explore with the Town the possibility of installing an emergency preemption system at the intersection of Brighton Street and Cross Street to facilitate fire truck access to the project site."

Response: The proponent will work with the Town to investigate the feasibility of installing an emergency vehicle pre-emption system at the intersection of Brighton Street at Cross Street.

We trust that this information is responsive to the comments raised by BSC in their March 16, 2006 memorandum concerning their review of the subject project. If you should have any questions or would like to discuss our responses in more detail, please feel free to contact me.

Sincerely,

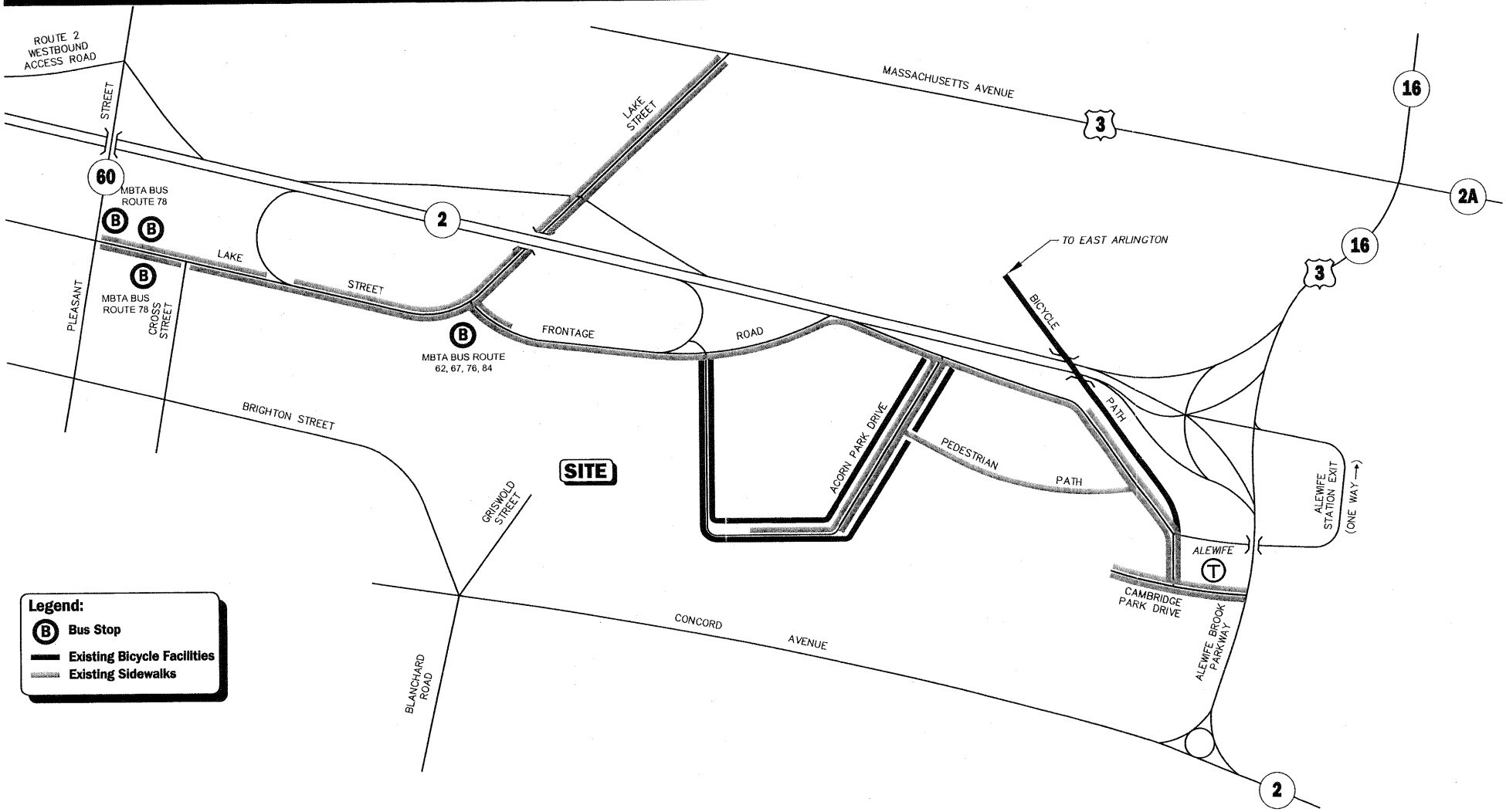
VANASSE & ASSOCIATES, INC.

Jeffrey S. Dirk, P.E., PTOE
Associate

JSD/rla

Attachments

cc: C. Kalauskas, P.E., S. Offei-Addo, P.E. – The BSC Group
S. Corridan – O'Neill Properties
J. Ward, Esquire – Nutter, McClennen & Fish, LLP
R. Engler – Stockard Engler & Brigham
D. Albrecht, P.E. – Rizzo Associates, Inc.
RDV, BG, AJA, File



Not To Scale

Figure 1

Project Site Vicinity
Bus Stop, Pedestrian and Bicycle Facilities Map

Vanasse & Associates, Inc.
Transportation Engineers & Planners

Table 15R
SIGNALIZED INTERSECTION LEVEL-OF-SERVICE AND QUEUE SUMMARY

Signalized Intersection/Peak Hour/Movement	2005 Existing				2010 No-Build				2010 Build			
	V/C[a]	Delay[b]	LOS[c]	Queue[d] Avg./95th	V/C	Delay	LOS	Queue Avg./95th	V/C	Delay	LOS	Queue Avg./95th
17. Pleasant Street at Brighton Street												
Weekday Morning:												
Brighton Street EB LT/TH/RT	0.21	20.9	C	1/2	0.25	25.7	C	1/2	0.25	25.7	C	1/2
Brighton Street WB LT/TH	0.28	21.4	C	1/3	0.34	26.6	C	1/3	0.34	26.6	C	1/3
Brighton Street WB RT	0.19	20.8	C	0/3	0.20	25.5	C	0/3	0.20	25.5	C	0/3
Pleasant Street NB LT/TH/RT	0.73	18.9	B	7/12	0.81	22.7	C	10/16	0.81	22.4	C	10/16
Pleasant Street SB LT	0.81	16.3	B	2/10	0.87	25.4	C	5/16	0.87	25.5	C	5/16
Pleasant Street SB TH/RT	0.68	6.4	A	5/13	0.74	7.4	A	8/18	0.74	7.5	A	8/18
Overall	**0.69**	**14.0**	**B**	--	**0.76**	**17.9**	**B**	--	**0.76**	**17.9**	**B**	--
Weekday Evening:												
Brighton Street EB LT/TH/RT	0.11	20.0	C	1/2	0.11	25.0	C	1/2	0.11	25.2	C	1/2
Brighton Street WB LT/TH	0.32	21.4	C	1/3	0.31	26.5	C	2/3	0.31	26.8	C	2/3
Brighton Street WB RT	0.31	21.3	C	0/7	0.60	30.8	C	2/5	0.60	31.3	C	2/5
Pleasant Street NB LT/TH/RT	0.77	18.8	B	8/14	0.86	26.6	C	13/25	0.86	26.8	C	13/25
Pleasant Street SB LT	0.71	11.8	B	2/6	0.77	19.2	B	4/14	0.77	19.4	B	4/14
Pleasant Street SB TH/RT	0.40	4.1	A	3/6	0.49	5.2	A	4/12	0.49	5.3	A	5/12
Overall	**0.61**	**14.6**	**B**	--	**0.78**	**20.4**	**C**	--	**0.78**	**20.6**	**C**	--

[a]Volume-to-capacity ratio.
[b]Control (signal) delay per vehicle in seconds.
[c]Level-of-Service.
[d]Queue length in vehicles.
[e]95th percentile queue is metered by upstream signal.
[f]Assumes a single approach lane. Field observations indicate that the approach functions as two lanes.
EB = eastbound; WB – westbound; NB = northbound; SB = southbound; LT = left-turning movements; TH = through movements; RT = right-turning movements.

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	16	16	10	10	10	16	16	16	11	13	13
Total Lost time (s)		4.0			4.0	4.0		4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00	1.00		1.00		1.00	1.00	
Frt		0.97			1.00	0.85		0.99		1.00	1.00	
Flt Protected		0.99			0.96	1.00		1.00		0.95	1.00	
Satd. Flow (prot)		2051			1699	1463		2044		1711	1918	
Flt Permitted		0.90			0.80	1.00		0.99		0.25	1.00	
Satd. Flow (perm)		1874			1413	1463		2028		453	1918	
Volume (vph)	17	29	16	51	7	246	4	452	35	478	833	22
Peak-hour factor, PHF	0.75	0.75	0.75	0.90	0.90	0.90	0.87	0.87	0.87	0.95	0.95	0.95
Adj. Flow (vph)	23	39	21	57	8	273	5	520	40	503	877	23
RTOR Reduction (vph)	0	17	0	0	0	228	0	4	0	0	1	0
Lane Group Flow (vph)	0	66	0	0	65	46	0	561	0	503	899	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	3%	0%	4%	9%	2%	2%	0%
Turn Type	Perm			Perm		Perm	Perm			pm+pt		
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)		8.5			8.5	8.5		20.5		38.5	38.5	
Effective Green, g (s)		9.5			9.5	9.5		21.5		39.5	39.5	
Actuated g/C Ratio		0.17			0.17	0.17		0.38		0.69	0.69	
Clearance Time (s)		5.0			5.0	5.0		5.0		5.0	5.0	
Vehicle Extension (s)		3.0			3.0	3.0		3.0		3.0	3.0	
Lane Grp Cap (vph)		312			236	244		765		623	1329	
v/s Ratio Prot										c0.20	0.47	
v/s Ratio Perm		0.04			c0.05	0.03		0.28		c0.36		
v/c Ratio		0.21			0.28	0.19		0.73		0.81	0.68	
Uniform Delay, d1		20.5			20.7	20.4		15.3		8.7	5.1	
Progression Factor		1.00			1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2		0.3			0.6	0.4		3.7		7.6	1.4	
Delay (s)		20.9			21.4	20.8		18.9		16.3	6.4	
Level of Service		C			C	C		B		B	A	
Approach Delay (s)		20.9			20.9			18.9			10.0	
Approach LOS		C			C			B			A	

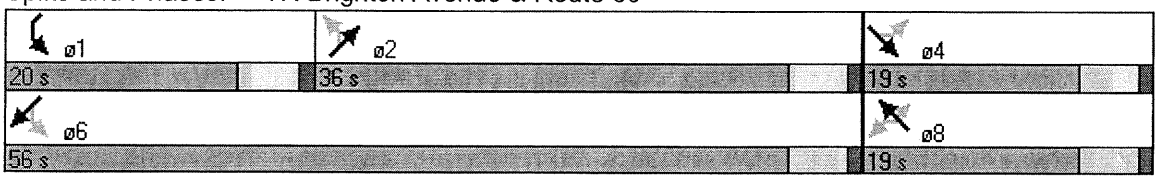
Intersection Summary			
HCM Average Control Delay	14.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	57.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	91.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	SEL	SET	NWL	NWT	NWR	NEL	NET	SWL	SWT
Lane Configurations									
Volume (vph)	17	29	51	7	246	4	452	478	833
Lane Group Flow (vph)	0	83	0	65	273	0	565	503	900
Turn Type	Perm		Perm		Perm	Perm		pm+pt	
Protected Phases		4		8			2	1	6
Permitted Phases	4		8		8	2		6	
Detector Phases	4	4	8	8	8	2	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	14.0	14.0	14.0	14.0	14.0	21.0	21.0	9.0	21.0
Total Split (s)	19.0	19.0	19.0	19.0	19.0	36.0	36.0	20.0	56.0
Total Split (%)	25.3%	25.3%	25.3%	25.3%	25.3%	48.0%	48.0%	26.7%	74.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag						Lag	Lag	Lead	
Lead-Lag Optimize?						Yes	Yes	Yes	
Recall Mode	None	None	None	None	None	None	None	None	None
v/c Ratio		0.25		0.28	0.58		0.75	0.78	0.68
Control Delay		21.1		27.3	9.4		22.8	17.1	8.7
Queue Delay		0.0		0.0	0.0		0.0	0.0	0.0
Total Delay		21.1		27.3	9.4		22.8	17.1	8.7
Queue Length 50th (ft)		19		20	0		161	54	129
Queue Length 95th (ft)		48		59	59		289	#247	316
Internal Link Dist (ft)		328		1307			420		615
Turn Bay Length (ft)									
Base Capacity (vph)		482		343	565		969	668	1434
Starvation Cap Reductn		0		0	0		0	0	23
Spillback Cap Reductn		0		0	0		0	0	0
Storage Cap Reductn		0		0	0		0	0	0
Reduced v/c Ratio		0.17		0.19	0.48		0.58	0.75	0.64

Intersection Summary

Cycle Length: 75
Actuated Cycle Length: 57.5
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 17: Brighton Avenue & Route 60



Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	12	10	10	12	16	12	11	13	12
Total Lost time (s)		4.0			4.0	4.0		4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00	1.00		1.00		1.00	1.00	
Frt		0.97			1.00	0.85		0.99		1.00	0.99	
Flt Protected		0.98			0.97	1.00		1.00		0.95	1.00	
Satd. Flow (prot)		2039			1715	1492		2135		1728	1950	
Flt Permitted		0.87			0.77	1.00		1.00		0.23	1.00	
Satd. Flow (perm)		1805			1372	1492		2132		411	1950	
Volume (vph)	16	13	10	45	21	391	2	535	36	374	484	23
Peak-hour factor, PHF	0.87	0.87	0.87	0.85	0.85	0.85	0.86	0.86	0.86	0.95	0.95	0.95
Adj. Flow (vph)	18	15	11	53	25	460	2	622	42	394	509	24
RTOR Reduction (vph)	0	9	0	0	0	379	0	4	0	0	2	0
Lane Group Flow (vph)	0	35	0	0	78	81	0	662	0	394	531	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	1%	0%	0%	0%	1%	0%	0%
Turn Type	Perm			Perm		Perm	Perm			pm+pt		
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)		9.1			9.1	9.1		22.3		38.3	38.3	
Effective Green, g (s)		10.1			10.1	10.1		23.3		39.3	39.3	
Actuated g/C Ratio		0.18			0.18	0.18		0.41		0.68	0.68	
Clearance Time (s)		5.0			5.0	5.0		5.0		5.0	5.0	
Vehicle Extension (s)		3.0			3.0	3.0		3.0		3.0	3.0	
Lane Grp Cap (vph)		318			241	263		865		557	1335	
v/s Ratio Prot										c0.15	0.27	
v/s Ratio Perm		0.02			c0.06	0.05		0.31		c0.34		
v/c Ratio		0.11			0.32	0.31		0.77		0.71	0.40	
Uniform Delay, d1		19.9			20.7	20.6		14.7		7.7	3.9	
Progression Factor		1.00			1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2		0.2			0.8	0.7		4.1		4.1	0.2	
Delay (s)		20.0			21.4	21.3		18.8		11.8	4.1	
Level of Service		C			C	C		B		B	A	
Approach Delay (s)		20.0			21.3			18.8			7.4	
Approach LOS		C			C			B			A	

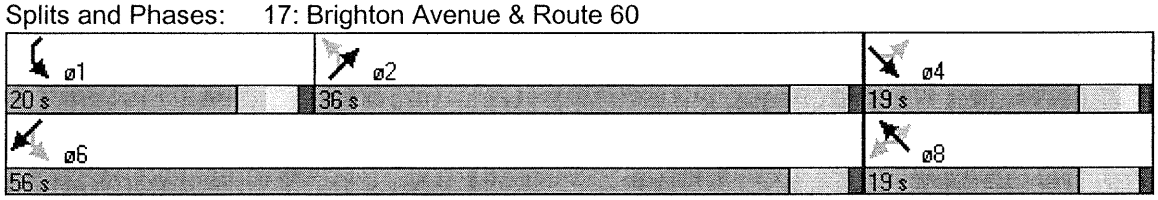
Intersection Summary			
HCM Average Control Delay	14.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	57.4	Sum of lost time (s)	8.0
Intersection Capacity Utilization	76.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	SEL	SET	NWL	NWT	NWR	NEL	NET	SWL	SWT
Lane Configurations									
Volume (vph)	16	13	45	21	391	2	535	374	484
Lane Group Flow (vph)	0	44	0	78	460	0	666	394	533
Turn Type	Perm		Perm		Perm	Perm		pm+pt	
Protected Phases		4		8			2	1	6
Permitted Phases	4		8		8	2		6	
Detector Phases	4	4	8	8	8	2	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	14.0	14.0	14.0	14.0	14.0	21.0	21.0	9.0	21.0
Total Split (s)	19.0	19.0	19.0	19.0	19.0	36.0	36.0	20.0	56.0
Total Split (%)	25.3%	25.3%	25.3%	25.3%	25.3%	48.0%	48.0%	26.7%	74.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag						Lag	Lag	Lead	
Lead-Lag Optimize?						Yes	Yes	Yes	
Recall Mode	None	None	None	None	None	None	None	None	None
v/c Ratio		0.13		0.32	0.72		0.78	0.70	0.40
Control Delay		20.3		27.9	10.3		23.2	13.7	5.2
Queue Delay		0.0		0.0	0.0		0.0	0.0	0.0
Total Delay		20.3		27.9	10.3		23.2	13.7	5.2
Queue Length 50th (ft)		10		24	0		181	41	58
Queue Length 95th (ft)		37		64	57		344	145	132
Internal Link Dist (ft)		328		1307			420		615
Turn Bay Length (ft)									
Base Capacity (vph)		463		348	715		1039	617	1447
Starvation Cap Reductn		0		0	0		0	0	0
Spillback Cap Reductn		0		0	0		0	0	0
Storage Cap Reductn		0		0	0		0	0	0
Reduced v/c Ratio		0.10		0.22	0.64		0.64	0.64	0.37

Intersection Summary

Cycle Length: 75
Actuated Cycle Length: 58
Natural Cycle: 60
Control Type: Actuated-Uncoordinated

Splits and Phases: 17: Brighton Avenue & Route 60



Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	16	16	10	10	10	16	16	16	11	13	13
Total Lost time (s)		4.0			4.0	4.0		4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00	1.00		1.00		1.00	1.00	
Frt		0.96			1.00	0.85		0.99		1.00	1.00	
Flt Protected		0.99			0.96	1.00		1.00		0.95	1.00	
Satd. Flow (prot)		2048			1698	1463		2047		1711	1919	
Flt Permitted		0.90			0.75	1.00		0.99		0.22	1.00	
Satd. Flow (perm)		1869			1329	1463		2034		401	1919	
Volume (vph)	18	30	17	54	7	259	4	574	37	505	961	23
Peak-hour factor, PHF	0.75	0.75	0.75	0.90	0.90	0.90	0.87	0.87	0.87	0.95	0.95	0.95
Adj. Flow (vph)	24	40	23	60	8	288	5	660	43	532	1012	24
RTOR Reduction (vph)	0	17	0	0	0	244	0	2	0	0	1	0
Lane Group Flow (vph)	0	70	0	0	68	44	0	706	0	532	1035	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	3%	0%	4%	9%	2%	2%	0%
Turn Type	Perm			Perm		Perm	Perm			pm+pt		
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)		9.2			9.2	9.2		27.9		48.3	48.3	
Effective Green, g (s)		10.2			10.2	10.2		28.9		49.3	49.3	
Actuated g/C Ratio		0.15			0.15	0.15		0.43		0.73	0.73	
Clearance Time (s)		5.0			5.0	5.0		5.0		5.0	5.0	
Vehicle Extension (s)		3.0			3.0	3.0		3.0		3.0	3.0	
Lane Grp Cap (vph)		282			201	221		871		611	1402	
v/s Ratio Prot										c0.21	0.54	
v/s Ratio Perm		0.04			c0.05	0.03		0.35		c0.42		
v/c Ratio		0.25			0.34	0.20		0.81		0.87	0.74	
Uniform Delay, d1		25.3			25.6	25.1		16.9		12.5	5.3	
Progression Factor		1.00			1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2		0.5			1.0	0.4		5.8		12.9	2.1	
Delay (s)		25.7			26.6	25.5		22.7		25.4	7.4	
Level of Service		C			C	C		C		C	A	
Approach Delay (s)		25.7			25.7			22.7			13.5	
Approach LOS		C			C			C			B	

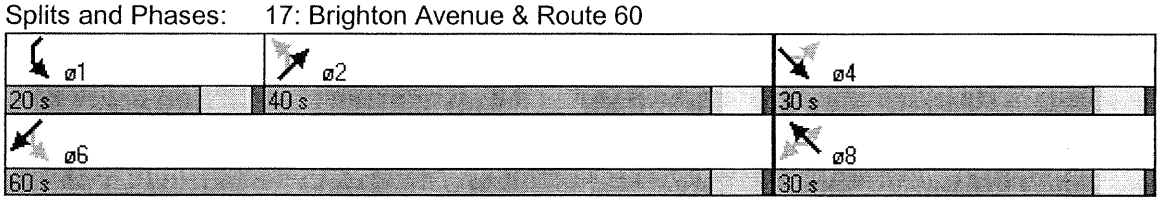
Intersection Summary			
HCM Average Control Delay	17.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	67.5	Sum of lost time (s)	8.0
Intersection Capacity Utilization	104.9%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	SEL	SET	NWL	NWT	NWR	NEL	NET	SWL	SWT
Lane Configurations									
Volume (vph)	18	30	54	7	259	4	574	505	961
Lane Group Flow (vph)	0	87	0	68	288	0	708	532	1036
Turn Type	Perm		Perm		Perm	Perm		pm+pt	
Protected Phases		4		8			2	1	6
Permitted Phases	4		8		8	2		6	
Detector Phases	4	4	8	8	8	2	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	14.0	14.0	14.0	14.0	14.0	21.0	21.0	9.0	21.0
Total Split (s)	30.0	30.0	30.0	30.0	30.0	40.0	40.0	20.0	60.0
Total Split (%)	33.3%	33.3%	33.3%	33.3%	33.3%	44.4%	44.4%	22.2%	66.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag						Lag	Lag	Lead	
Lead-Lag Optimize?						Yes	Yes	Yes	
Recall Mode	None	None	None	None	None	None	None	None	None
v/c Ratio		0.28		0.34	0.62		0.81	0.91	0.74
Control Delay		24.5		32.6	10.4		25.9	36.8	10.1
Queue Delay		0.0		0.0	0.0		0.0	0.0	0.3
Total Delay		24.5		32.6	10.4		25.9	36.8	10.4
Queue Length 50th (ft)		26		27	0		239	129	186
Queue Length 95th (ft)		53		65	63		401	#383	449
Internal Link Dist (ft)		328		1307			420		615
Turn Bay Length (ft)									
Base Capacity (vph)		618		414	657		988	584	1448
Starvation Cap Reductn		0		0	0		0	0	83
Spillback Cap Reductn		0		0	0		0	0	0
Storage Cap Reductn		0		0	0		0	0	0
Reduced v/c Ratio		0.14		0.16	0.44		0.72	0.91	0.76

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 67.7
Natural Cycle: 65
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 17: Brighton Avenue & Route 60



Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	12	10	10	12	16	12	11	13	12
Total Lost time (s)		4.0			4.0	4.0		4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00	1.00		1.00		1.00	1.00	
Frt		0.96			1.00	0.85		0.99		1.00	0.99	
Flt Protected		0.98			0.97	1.00		1.00		0.95	1.00	
Satd. Flow (prot)		2035			1715	1492		2137		1728	1952	
Flt Permitted		0.88			0.78	1.00		1.00		0.19	1.00	
Satd. Flow (perm)		1823			1392	1492		2135		348	1952	
Volume (vph)	17	14	11	47	22	411	2	648	38	394	619	24
Peak-hour factor, PHF	0.87	0.87	0.87	0.85	0.85	0.85	0.86	0.86	0.86	0.95	0.95	0.95
Adj. Flow (vph)	20	16	13	55	26	484	2	753	44	415	652	25
RTOR Reduction (vph)	0	11	0	0	0	317	0	2	0	0	1	0
Lane Group Flow (vph)	0	38	0	0	81	167	0	797	0	415	676	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	1%	0%	0%	0%	1%	0%	0%
Turn Type	Perm			Perm		Perm	Perm			pm+pt		
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)		12.9			12.9	12.9		31.2		51.0	51.0	
Effective Green, g (s)		13.9			13.9	13.9		32.2		52.0	52.0	
Actuated g/C Ratio		0.19			0.19	0.19		0.44		0.70	0.70	
Clearance Time (s)		5.0			5.0	5.0		5.0		5.0	5.0	
Vehicle Extension (s)		3.0			3.0	3.0		3.0		3.0	3.0	
Lane Grp Cap (vph)		343			262	281		930		540	1374	
v/s Ratio Prot										c0.16	0.35	
v/s Ratio Perm		0.02			0.06	c0.11		c0.37		0.38		
v/c Ratio		0.11			0.31	0.60		0.86		0.77	0.49	
Uniform Delay, d1		24.9			25.9	27.4		18.8		12.7	5.0	
Progression Factor		1.00			1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2		0.1			0.7	3.4		7.8		6.5	0.3	
Delay (s)		25.0			26.5	30.8		26.6		19.2	5.2	
Level of Service		C			C	C		C		B	A	
Approach Delay (s)		25.0			30.2			26.6			10.5	
Approach LOS		C			C			C			B	

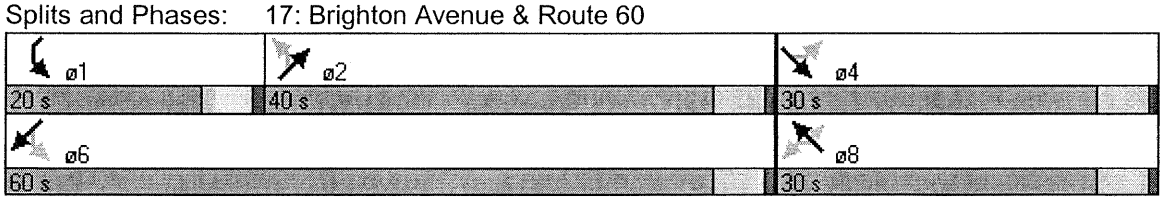
Intersection Summary			
HCM Average Control Delay	20.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	73.9	Sum of lost time (s)	12.0
Intersection Capacity Utilization	89.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	SEL	SET	NWL	NWT	NWR	NEL	NET	SWL	SWT
Lane Configurations									
Volume (vph)	17	14	47	22	411	2	648	394	619
Lane Group Flow (vph)	0	49	0	81	484	0	799	415	677
Turn Type	Perm		Perm		Perm	Perm		pm+pt	
Protected Phases		4		8			2	1	6
Permitted Phases	4		8		8	2		6	
Detector Phases	4	4	8	8	8	2	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	14.0	14.0	14.0	14.0	14.0	21.0	21.0	9.0	21.0
Total Split (s)	30.0	30.0	30.0	30.0	30.0	40.0	40.0	20.0	60.0
Total Split (%)	33.3%	33.3%	33.3%	33.3%	33.3%	44.4%	44.4%	22.2%	66.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag						Lag	Lag	Lead	
Lead-Lag Optimize?						Yes	Yes	Yes	
Recall Mode	None	None	None	None	None	None	None	None	None
v/c Ratio		0.14		0.30	0.81		0.86	0.82	0.49
Control Delay		20.6		29.3	18.2		32.0	29.8	7.8
Queue Delay		0.0		0.0	0.0		0.0	0.0	0.0
Total Delay		20.6		29.3	18.2		32.0	29.8	7.8
Queue Length 50th (ft)		15		35	40		306	102	105
Queue Length 95th (ft)		39		67	119		#612	#337	293
Internal Link Dist (ft)		328		1307			420		615
Turn Bay Length (ft)									
Base Capacity (vph)		579		439	727		995	517	1401
Starvation Cap Reductn		0		0	0		0	0	0
Spillback Cap Reductn		0		0	0		0	0	0
Storage Cap Reductn		0		0	0		0	0	0
Reduced v/c Ratio		0.08		0.18	0.67		0.80	0.80	0.48

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 74.3
Natural Cycle: 70
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 17: Brighton Avenue & Route 60



Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	16	16	10	10	10	16	16	16	11	13	13
Total Lost time (s)		4.0			4.0	4.0		4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00	1.00		1.00		1.00	1.00	
Frt		0.96			1.00	0.85		0.99		1.00	1.00	
Flt Protected		0.99			0.96	1.00		1.00		0.95	1.00	
Satd. Flow (prot)		2048			1698	1463		2047		1711	1919	
Flt Permitted		0.90			0.75	1.00		0.99		0.22	1.00	
Satd. Flow (perm)		1869			1329	1463		2034		403	1919	
Volume (vph)	18	30	17	54	7	259	4	575	37	505	966	23
Peak-hour factor, PHF	0.75	0.75	0.75	0.90	0.90	0.90	0.87	0.87	0.87	0.95	0.95	0.95
Adj. Flow (vph)	24	40	23	60	8	288	5	661	43	532	1017	24
RTOR Reduction (vph)	0	17	0	0	0	244	0	2	0	0	1	0
Lane Group Flow (vph)	0	70	0	0	68	44	0	707	0	532	1040	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	3%	0%	4%	9%	2%	2%	0%
Turn Type	Perm			Perm		Perm	Perm			pm+pt		
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)		9.2			9.2	9.2		28.0		48.3	48.3	
Effective Green, g (s)		10.2			10.2	10.2		29.0		49.3	49.3	
Actuated g/C Ratio		0.15			0.15	0.15		0.43		0.73	0.73	
Clearance Time (s)		5.0			5.0	5.0		5.0		5.0	5.0	
Vehicle Extension (s)		3.0			3.0	3.0		3.0		3.0	3.0	
Lane Grp Cap (vph)		282			201	221		874		610	1402	
v/s Ratio Prot										c0.21	0.54	
v/s Ratio Perm		0.04			c0.05	0.03		0.35		c0.43		
v/c Ratio		0.25			0.34	0.20		0.81		0.87	0.74	
Uniform Delay, d1		25.3			25.6	25.1		16.8		12.5	5.4	
Progression Factor		1.00			1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2		0.5			1.0	0.4		5.6		13.0	2.2	
Delay (s)		25.7			26.6	25.5		22.4		25.5	7.5	
Level of Service		C			C	C		C		C	A	
Approach Delay (s)		25.7			25.7			22.4			13.6	
Approach LOS		C			C			C			B	

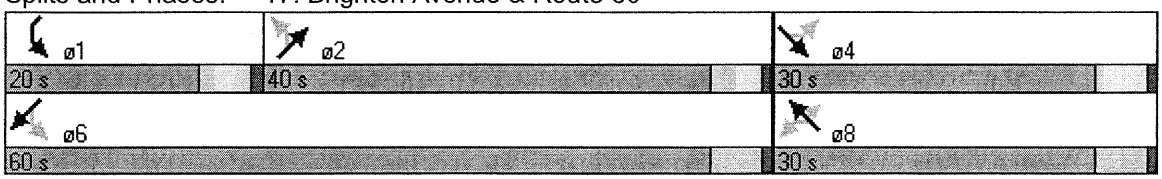
Intersection Summary			
HCM Average Control Delay	17.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	67.5	Sum of lost time (s)	8.0
Intersection Capacity Utilization	105.2%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	SEL	SET	NWL	NWT	NWR	NEL	NET	SWL	SWT
Lane Configurations									
Volume (vph)	18	30	54	7	259	4	575	505	966
Lane Group Flow (vph)	0	87	0	68	288	0	709	532	1041
Turn Type	Perm		Perm		Perm	Perm		pm+pt	
Protected Phases		4		8			2	1	6
Permitted Phases	4		8		8	2		6	
Detector Phases	4	4	8	8	8	2	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	14.0	14.0	14.0	14.0	14.0	21.0	21.0	9.0	21.0
Total Split (s)	30.0	30.0	30.0	30.0	30.0	40.0	40.0	20.0	60.0
Total Split (%)	33.3%	33.3%	33.3%	33.3%	33.3%	44.4%	44.4%	22.2%	66.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag						Lag	Lag	Lead	
Lead-Lag Optimize?						Yes	Yes	Yes	
Recall Mode	None	None	None	None	None	None	None	None	None
v/c Ratio		0.28		0.34	0.62		0.81	0.91	0.74
Control Delay		24.5		32.6	10.4		25.9	37.1	10.2
Queue Delay		0.0		0.0	0.0		0.0	0.0	0.3
Total Delay		24.5		32.6	10.4		25.9	37.1	10.5
Queue Length 50th (ft)		26		27	0		240	130	188
Queue Length 95th (ft)		53		65	63		402	#384	456
Internal Link Dist (ft)		328		1307			420		615
Turn Bay Length (ft)									
Base Capacity (vph)		617		413	657		988	583	1447
Starvation Cap Reductn		0		0	0		0	0	83
Spillback Cap Reductn		0		0	0		0	0	0
Storage Cap Reductn		0		0	0		0	0	0
Reduced v/c Ratio		0.14		0.16	0.44		0.72	0.91	0.76

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 67.8
Natural Cycle: 70
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 17: Brighton Avenue & Route 60



Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	12	10	10	12	16	12	11	13	12
Total Lost time (s)		4.0			4.0	4.0		4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00	1.00		1.00		1.00	1.00	
Frt		0.96			1.00	0.85		0.99		1.00	0.99	
Flt Protected		0.98			0.97	1.00		1.00		0.95	1.00	
Satd. Flow (prot)		2035			1715	1492		2137		1728	1952	
Flt Permitted		0.88			0.78	1.00		1.00		0.19	1.00	
Satd. Flow (perm)		1823			1392	1492		2135		347	1952	
Volume (vph)	17	14	11	47	22	411	2	653	38	394	621	24
Peak-hour factor, PHF	0.87	0.87	0.87	0.85	0.85	0.85	0.86	0.86	0.86	0.95	0.95	0.95
Adj. Flow (vph)	20	16	13	55	26	484	2	759	44	415	654	25
RTOR Reduction (vph)	0	11	0	0	0	316	0	2	0	0	1	0
Lane Group Flow (vph)	0	38	0	0	81	168	0	803	0	415	678	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	1%	0%	0%	0%	1%	0%	0%
Turn Type	Perm			Perm		Perm	Perm			pm+pt		
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)		13.0			13.0	13.0		31.6		51.5	51.5	
Effective Green, g (s)		14.0			14.0	14.0		32.6		52.5	52.5	
Actuated g/C Ratio		0.19			0.19	0.19		0.44		0.70	0.70	
Clearance Time (s)		5.0			5.0	5.0		5.0		5.0	5.0	
Vehicle Extension (s)		3.0			3.0	3.0		3.0		3.0	3.0	
Lane Grp Cap (vph)		343			262	280		934		539	1376	
v/s Ratio Prot										c0.16	0.35	
v/s Ratio Perm		0.02			0.06	c0.11		c0.38		0.38		
v/c Ratio		0.11			0.31	0.60		0.86		0.77	0.49	
Uniform Delay, d1		25.1			26.1	27.7		18.9		12.9	5.0	
Progression Factor		1.00			1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2		0.1			0.7	3.6		8.0		6.6	0.3	
Delay (s)		25.2			26.8	31.3		26.8		19.4	5.3	
Level of Service		C			C	C		C		B	A	
Approach Delay (s)		25.2			30.6			26.8			10.6	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM Average Control Delay	20.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	74.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	89.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	SEL	SET	NWL	NWT	NWR	NEL	NET	SWL	SWT
Lane Configurations									
Volume (vph)	17	14	47	22	411	2	653	394	621
Lane Group Flow (vph)	0	49	0	81	484	0	805	415	679
Turn Type	Perm		Perm		Perm	Perm		pm+pt	
Protected Phases		4		8			2	1	6
Permitted Phases	4		8		8	2		6	
Detector Phases	4	4	8	8	8	2	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	14.0	14.0	14.0	14.0	14.0	21.0	21.0	9.0	21.0
Total Split (s)	30.0	30.0	30.0	30.0	30.0	40.0	40.0	20.0	60.0
Total Split (%)	33.3%	33.3%	33.3%	33.3%	33.3%	44.4%	44.4%	22.2%	66.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag						Lag	Lag	Lead	
Lead-Lag Optimize?						Yes	Yes	Yes	
Recall Mode	None	None	None	None	None	None	None	None	None
v/c Ratio		0.14		0.30	0.81		0.86	0.82	0.49
Control Delay		20.6		29.4	18.4		32.1	30.4	7.8
Queue Delay		0.0		0.0	0.0		0.0	0.0	0.0
Total Delay		20.6		29.4	18.4		32.1	30.4	7.8
Queue Length 50th (ft)		15		35	41		311	104	106
Queue Length 95th (ft)		39		67	120		#620	#340	294
Internal Link Dist (ft)		328		1307			420		615
Turn Bay Length (ft)									
Base Capacity (vph)		576		436	724		993	513	1401
Starvation Cap Reductn		0		0	0		0	0	0
Spillback Cap Reductn		0		0	0		0	0	0
Storage Cap Reductn		0		0	0		0	0	0
Reduced v/c Ratio		0.09		0.19	0.67		0.81	0.81	0.48

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 74.8
Natural Cycle: 70
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 17: Brighton Avenue & Route 60