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December 7, 2012

**File:** 5012230-001

Milliken Developments  
901 West 3<sup>rd</sup> Street, Suite 304  
North Vancouver, BC V7P 3P9

**Attention:** Ms. Kate Milliken-Binns

Dear Ms. Milliken-Binns,

**Reference:** Traffic Impact Study  
707 Keith Road – West Vancouver, BC

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As part of its Rezoning and Development Permit application, Milliken Developments retained MMM Group to prepare a Traffic Impact Study of their proposed Supportive Living and Memory Care community on the surrounding road network. This letter report presents our findings, recommendations, and conclusions regarding the need for any improvements to the adjacent and nearby transportation system in order to maintain a satisfactory level of service, an acceptable level of safety, and the appropriate access provisions. Key items that have been considered include, in no particular order:

- ✓ Spacing between the proposed site driveway and the Taylor Way intersection
- ✓ Trip generation rates and parking generation ratios
- ✓ Impact on traffic on the surrounding road network

**PROPOSED DEVELOPMENT**

As shown in **Figure 1**, Milliken Developments is proposing to construct a 92-suite / 110-resident (bed) Supportive Living and Memory Care community on two single-family residential lots (707 Keith Road and 525 Taylor Way) which are located in the northwest corner of the intersection of Taylor Way and Keith Road in the District of West Vancouver (District). Access to the eight surface and 32 underground parking spaces would be provided from a right-in / right-out driveway located on Keith Road (see **Figure 2**.)

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Figure 1 – Vicinity Map

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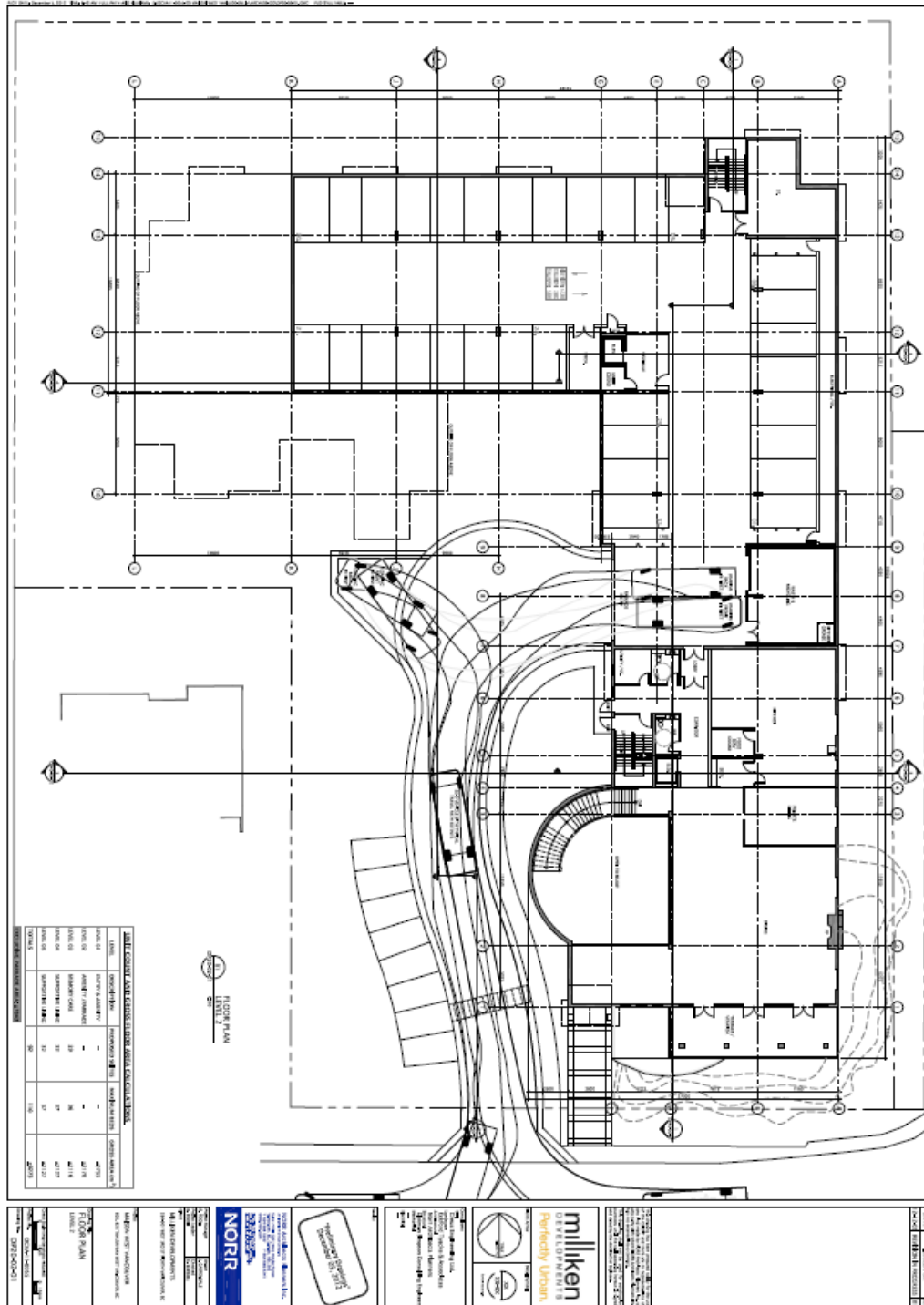


Figure 2 – Site Plan

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## METHODOLOGY

In order to address the District's requirements, MMM Group completed the following work plan:

- ✓ Confirmed the scope of the Traffic Impact Study with District staff.
- ✓ Conducted peak period trip generation surveys at the 107-unit Sunrise of Lynn Valley assisted living facility located at 980 Lynn Valley Road, North Vancouver on Tuesday, November 20, 2012 between 7:00 and 9:00 a.m. and 4:00 and 6:00 p.m.
- ✓ Visited the site and surroundings on Monday, November 26, 2012 to clearly understand the study area in terms of current access, street laning, parking, pedestrian and cyclist facilities, transit, and traffic control measures.
- ✓ Estimated background traffic for the study horizon (2022) which incorporates traffic generated by the Evelyn by Onni project plus the annual growth rate of 1.0 percent per year provided by the Ministry.
- ✓ Estimated site-generated traffic for the development (at build-out) based on trip rate results of the trip generation survey, information in MMM Group files measured at similar developments in Metro Vancouver as well as data published in the Institute of Transportation's *Trip Generation, 8th Edition*.
- ✓ Quantified the traffic generated by existing uses, i.e. single-family homes
- ✓ Quantified the amount of new site-generated vehicular traffic that will be added to the adjacent road at build-out (= proposed development – existing uses)
- ✓ Estimated directional distribution for the development (at build-out) using trip orientation established during the rezoning process for the Evelyn by Onni project and assigned site-generated traffic to the road network for the 2022 peak hour scenarios.
- ✓ Estimated total traffic for the 2022 horizon year by summing the site-generated and background traffic.
- ✓ Used Synchro 8 software to evaluate operational performance (i.e. delays, queues, etc.) at study intersections for the following scenarios:
  - Existing (2012) weekday AM and PM peak hours
  - Future (2022) weekday AM and PM peak hours without the development
  - Future (2022) weekday AM and PM peak hours with the development

During the weekday PM peak hour, southbound traffic queues on Taylor Way were observed to spill back from the Marine Drive intersection through the Keith Road intersection. As such, the capacity of the southbound through lanes (in Synchro) was reduced to 1000 vehicles per hour (weekday afternoon peak hour only) to better reflect observed capacity of the southbound movement through the intersection.

- ✓ Reviewed and commented on site circulation, pedestrian connections and parking supply.

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**FINDINGS**

*Existing Traffic Volumes*

Existing weekday morning and afternoon Saturday midday peak hour traffic volumes at the intersection of Keith Road and Taylor Way are illustrated in **Figure 3**. As suggested above, southbound traffic on Taylor Way experiences long queues (and corresponding long delays) during peak periods. Queues spillback from the Marine Drive intersection, resulting from capacity constraints on the Lions Gate Bridge. This condition was observed during the traffic counts for the weekday afternoon peak hour only (i.e. did not occur during the morning peak hour).

*Trip Generation Counts*

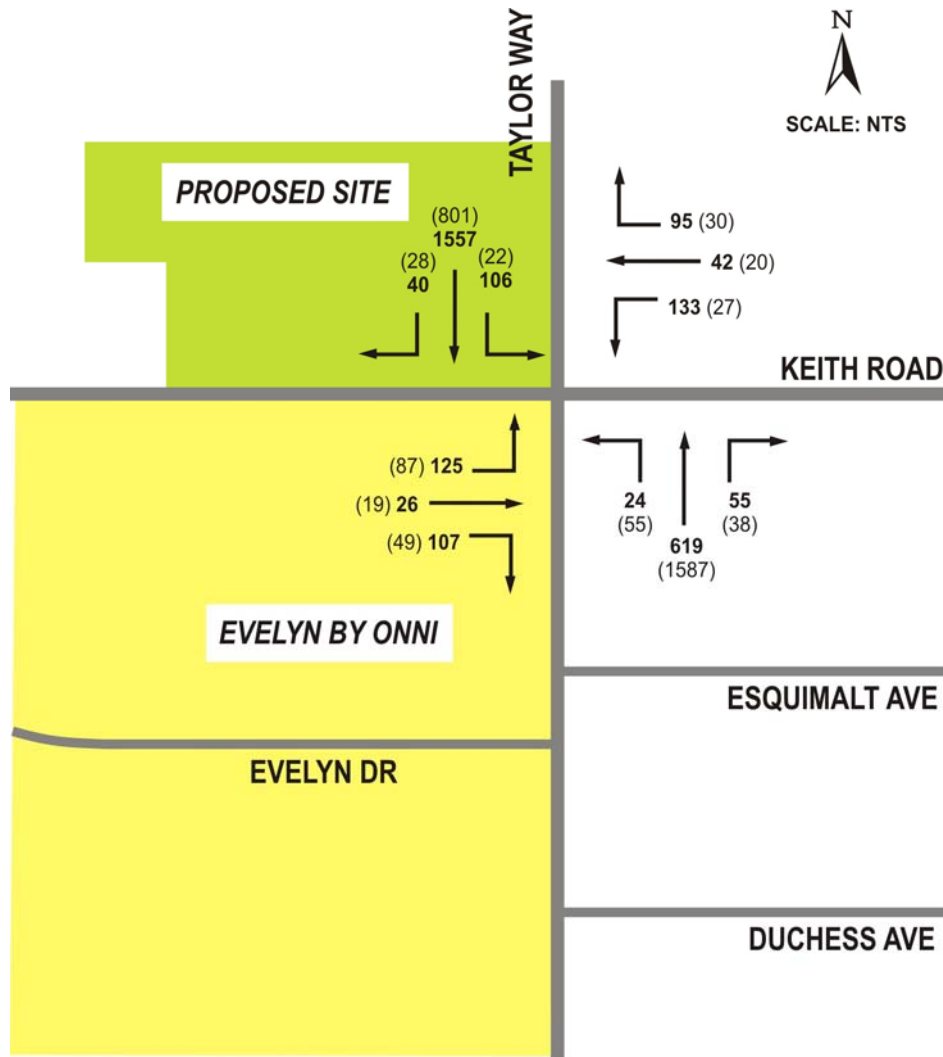
Trip generation counts were conducted by MMM Group to measure the trip generation at a similar Supportive Living and Memory Care community, namely Sunrise of Lynn Valley in North Vancouver. Statistics for the existing and proposed Supportive Living and Memory Care communities are compared in **Table 1**.

**Table 1: Comparison of Building Statistics**

Characteristic	Sunrise of Lynn Valley (Existing)	707 Keith Road (Proposed)
<b>Building</b>		
• Land Use	Supportive Living and Memory Care	Supportive Living and Memory Care
• Suites	96	92
• Residents (Beds)	107	110
<b>Other Variables</b>		
• Classification of adjacent street	Major Arterial	Major Road
• Availability of on-street parking	Prohibited	Limited
• No. of bus routes on adjacent street	3	1
• Distance to nearest bus stop	<200m	<200m
• Distance to nearest residences	<200m	<200m

As shown in Table 1, the existing and proposed Supportive Living and Memory Care communities share similar characteristics including availability of transit service, lack of nearby on-street parking, and classification of adjacent streets.

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**LEGEND**

- Weekday AM Peak Hour Volumes      **xx**
- Weekday PM Peak Hour Volumes      **(xx)**

**Figure 3 – Existing (2012) Traffic Volumes**

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Published data indicates that trip generation peaks at Supportive Living and Memory Care communities during the weekday AM and PM peak hours.<sup>1</sup> The trip generation at Sunrise of Lynn Valley is summarized in **Table 2** for typical weekday AM and PM peak hours with published trip generation rates provided for comparative purposes.

**Table 2 – Supportive Living and Memory Care Trip Rates**

Source	Independent Variable	AM Peak Hour			PM Peak Hour			Notes
		Entering	Exiting	Total*	Entering	Exiting	Total*	
Trip Generation Survey	Beds	73%	27%	0.24	41%	59%	0.30	1
ITE	Beds	65%	35%	0.14	44%	56%	0.22	2

Notes: \* - vehicle trips per independent variable, e.g. bed  
 1 – Trip Generation Survey, Tuesday, November 20, 2012 - Sunrise of Lynn Valley, North Vancouver  
 2 – Land Use 254: Assisted Living, *Trip Generation, 8<sup>th</sup> Edition* (Washington, DC: Institute of Transportation Engineers, 2008)

A key finding is that the trip rates and directional distribution measured at Sunrise of Lynn Valley provide a conservative (or high) estimate of trip generation for the proposed form of development.

*Site Generated Traffic*

Trip rates used to estimate site-generated traffic for the existing and proposed forms of development during the weekday AM and PM peak hours are summarized in **Table 3**.

**Table 3 – Weekday Peak Hour Trip Rates**

Land Use	Independent Variable	AM Peak Hour			PM Peak Hour			Source
		Entering	Exiting	Total*	Entering	Exiting	Total*	
Supportive Living and Memory Care	Beds	73%	27%	0.24	41%	59%	0.30	1
Single-Family Residential	Dwelling Units	25%	75%	0.75	63%	37%	1.01	2

Notes: \* - vehicle trips per independent variable, e.g. bed  
 1 – Trip Generation Survey, Tuesday, November 20, 2012 - Sunrise of Lynn Valley, North Vancouver  
 2 – Land Use 210: Single-Family Residential, *Trip Generation, 8<sup>th</sup> Edition* (Washington, DC: Institute of Transportation Engineers, 2008)

The site-generated traffic volumes for the proposed development are presented in **Table 4**.

<sup>1</sup> *Trip Generation, 8<sup>th</sup> Edition* (Washington, DC: ITE, 2008)

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**Table 4 – Site-Generated Traffic Volumes\***

Land Use	AM Peak Hour			PM Peak Hour		
	Entering	Exiting	Total	Entering	Exiting	Total
Supportive Living and Memory Care	20	7	27	13	20	33
Single-Family Residential (Existing)	-1	-1	-2	-1	-1	-2
<b>TOTAL</b>	<b>19</b>	<b>6</b>	<b>25</b>	<b>12</b>	<b>19</b>	<b>31</b>

Notes: \* - vehicles per hour (vph)

When completed, the development is expected to add 25 new vehicle trips (= 19 entering + 6 exiting) to the road network during the weekday AM peak hour of adjacent street traffic and 31 vehicle trips (= 12 entering + 19 exiting) during the PM peak hour.

*Trip Distribution and Traffic Assignment*

Site-generated traffic was distributed using trip orientation established during the rezoning process for the Evelyn by Onni project across the street:

- ✓ 20% to/from west
- ✓ 30% to/from north
- ✓ 50% to/from south

The assignment of site-generated traffic to the study intersection is illustrated in **Figure 4** and accounts for the right-in / right-out movements at the site driveway plus the new roundabout just west of the site at Keith Road and Evelyn Drive. Consequently, site-generated traffic must approach from Taylor Way while departing traffic has an opportunity to U-turn at Evelyn Drive in order to turn north (left) or south (right) at Taylor Way.

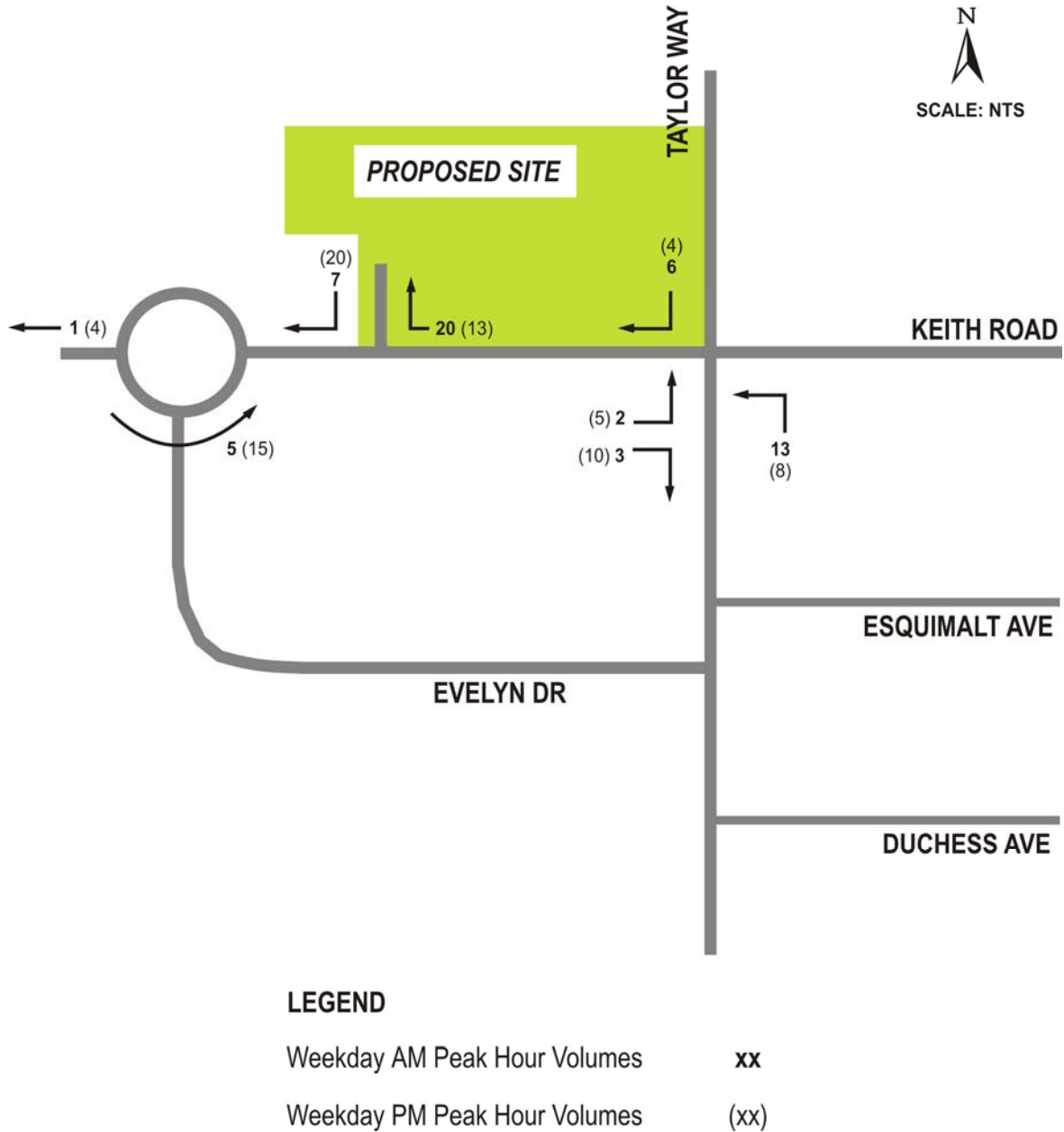
*Future (2022) Total Traffic*

The background 2022 peak hour traffic volumes (i.e. without development) incorporates traffic generated by the Evelyn by Onni project plus the annual growth rate of 1.0 percent per year provided by the Ministry. Given that traffic volumes at the Keith Road / Taylor Way intersection currently operate at capacity during peak periods, increases in through traffic may result in longer queues rather than more traffic traveling through the intersection.

Future 2022 total traffic volumes were determined by adding the site-generated traffic volumes to the 2022 future traffic volumes without development. Total traffic volumes are illustrated in **Figure 5**.

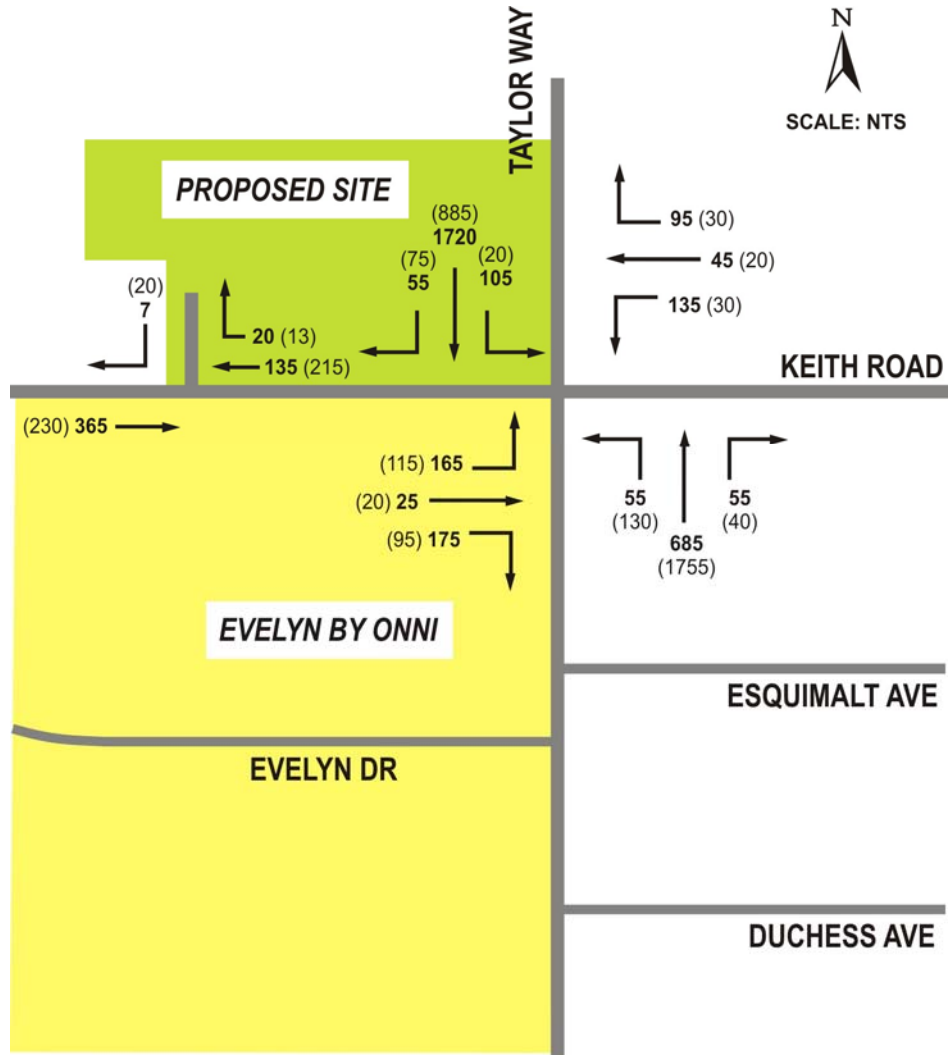


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**Figure 4 – Site-Generated Traffic Volumes (at build-out)**

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**LEGEND**

- Weekday AM Peak Hour Volumes      **xx**
- Weekday PM Peak Hour Volumes      (xx)

Turning movements rounded to nearest 5

**Figure 5 – Future (2022) Total Peak Hour Traffic Volumes**

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### *Operational Analysis*

The future analysis accounts for the right-in / right-out movements at the site driveway and includes improved laning on Keith Road at Taylor Way (west leg of intersection) which provides eastbound left-turn and right-turn lanes (each with 35m storage length). The remaining intersection approaches are modeled per existing conditions.

Reported measures of traffic performance include volume to capacity (v/c) ratio and a delay-based traffic Level of Service (LOS) indicator ranging from LOS A (ideal) to LOS F (over-saturated) conditions. Typical peak hour urban conditions are in the LOS C to LOS D range with average delays ranging from 20 to 55 seconds per vehicle at signalized intersections and 15 to 35 seconds per vehicle at unsignalized intersections. As a target for design parameters, LOS D for individual approaches is considered appropriate for the study area. The results – based upon the *Highway Capacity Manual* (Washington DC: Transportation Research Board, 2010) intersection capacity generated by the Synchro software – are attached to this report and summarized in **Table 5** for the following scenarios:

- ✓ Existing (2012) weekday AM and PM peak hours
- ✓ Future (2022) weekday AM and PM peak hours without the development
- ✓ Future (2022) weekday AM and PM peak hours with the development

Key findings from Table 5 include:

- ✓ Keith Road / Taylor Way:
  - During the weekday AM peak hour, the east and westbound approaches to this signalized intersection currently operate at LOS E and LOS F. These approaches are expected to continue operating at LOS E and LOS F in the future, even with the planned improvements.
  - During the weekday PM peak hour, movements on all but one of the approaches operate at LOS D or better. Southbound traffic is expected to operate at LOS E, given that southbound traffic queues on Taylor Way spill back from the Marine Drive intersection through the Keith Road intersection.
- ✓ Keith Road / Driveway:
  - The site driveway is expected to operate at LOS B or better.

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**Table 5 – Existing and Future Peak Hour Traffic Conditions**

Location	Intersection Control	Movement	Existing (2012)		Future (2022) without Development		Future (2022) with Development	
			LOS	V/C Ratio	LOS	V/C Ratio	LOS	V/C Ratio
<b>Weekday AM Peak Hour</b>								
Keith Road / Taylor Way	Traffic Signal	EBL			F	1.74	F	1.87
		EBT	F	1.77	C	0.09	C	0.09
		EBR			F	1.34	F	1.36
		WBLT	F	1.12	E	0.89	E	0.92
		WBR	B	0.35	B	0.38	C	0.39
		NBL	A	0.13	A	0.23	B	0.29
		NBT	B	0.51	B	0.51	B	0.49
		SBL	A	0.28	A	0.29	A	0.28
SBT	C	0.89	D	0.98	D	1.01		
Keith Road / Driveway	Minor Street Stop Control	WBTR	n/a		n/a		A	0.01
		SBR					A	0.10
<b>Weekday PM Peak Hour</b>								
Keith Road / Taylor Way	Traffic Signal	EBL			D	0.66	D	0.67
		EBT	D	0.75	C	0.08	C	0.08
		EBR			A	0.33	A	0.34
		WBLT	C	0.28	D	0.29	D	0.28
		WBR	A	0.13	A	0.14	A	0.14
		NBL	A	0.16	A	0.40	A	0.43
		NBT	C	0.90	C	0.97	C	0.97
		SBL	A	0.13	A	0.13	A	0.13
SBT	C	0.89	E	1.08	F	1.09		
Keith Road / Driveway	Minor Street Stop Control	WBTR	n/a		n/a		A	0.03
		SBLR					A	0.15

Notes: NB = northbound, etc. L = left, etc. LOS = Level of Service, V/C Ratio = Volume-to-Capacity Ratio

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The results of the intersection queuing analysis are summarized in **Table 6**.

**Table 6 – Comparison of Future (2022) Queues and Storage Length**

Location	Movement	Storage Length (m)	95 <sup>th</sup> Percentile Queue Length (m)	
			Future (2022) without Development	Future (2022) with Development
<b>Weekday AM Peak Hour</b>				
Keith Road / Taylor Way	EBL	35	85	85
	EBT	n/a	10	10
	EBR	35	15	25
	WBT	n/a	55	50
	WBR	channelized	15	15
	NBL	45	10	10
	NBT	n/a	75	75
	SBL	40	15	15
SBT	n/a	280	280	
<b>Weekday PM Peak Hour</b>				
Keith Road / Taylor Way	EBL	35	40	40
	EBT	n/a	10	10
	EBR	35	15	10
	WBT	n/a	20	20
	WBR	channelized	5	0
	NBL	45	20	20
	NBT	n/a	300	305
	SBL	40	5	5
SBT	n/a	180	185	

Notes: NB = northbound, etc., queue length rounded to the nearest 5m

**Key findings include:**

- ✓ Northbound and southbound left-turn queue lengths on Taylor Way (from analysis) are within available storage limits.
- ✓ If forecasted site traffic volumes materialize, the eastbound left-turn queue may exceed available storage length during weekday peak hours and consequently block the site driveway.
- ✓ During peak hours, queues on Taylor Way are expected to range between 75 and 300m at the Keith Road intersection. Spillback from adjacent intersections, however, was observed during the weekday afternoon peak hour. Increases in traffic volume could, therefore, result in longer queues rather than increased intersection utilization.

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### *Site Circulation*

As illustrated in Figure 2, key circulation elements of the site include:

- ✓ Hardscaped road with an adjacent sidewalk connecting the site driveway on Keith Road and the underground parkade.
- ✓ Eight perpendicular visitor parking spaces located on the hardscaped road near the building entrance.
- ✓ A hammerhead turnaround at the entrance to the underground parkade.
- ✓ Designated loading area under the building adjacent to the lobby, kitchen, and waste and recycling room.
- ✓ Thirty-two underground parking spaces for visitors and staff.

Benefits of the current site plan include:

- ✓ The throat length at the site driveway would accommodate at least one vehicle, which is equal to the maximum number of vehicles expected to queue at this location.
- ✓ Site servicing (i.e. deliveries, garbage and recycling pick-up, etc.) would occur under the building thereby reducing, if not eliminating visual and auditory impacts.

Concerns about the current site plan include:

- ✓ Combining the loading area and the entrance to the underground parkade may result in truck-passenger car conflicts as trucks back into the loading area while passenger cars attempt to enter or exit the parkade. This concern could be mitigated by adding engineering controls (preferred) such as traffic signals, parabolic mirrors, etc.; or providing administrative controls (least preferred) such as having staff stop traffic while trucks manoeuvre around the loading area.

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*Pedestrian Connectivity*

**Sidewalk along Keith Road / Taylor Way** – sidewalk would continue to be provided along the site frontage providing opportunities for residents, visitors and staff to walk to nearby destinations, e.g. bus stops on Taylor Way, shops and services at Park Royal.

**Keith Road / Taylor Way Intersection** – this signalized intersection is equipped with push-button-actuated pedestrian signals and marked with crosswalks facilitating the movement of pedestrians across the intersection.



**Figure 6 – Pedestrian Signals and Sidewalk on Northwest Corner of Keith Road / Taylor Way**

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*Parking Supply*

Forty off-street parking spaces (= 8 surface + 32 underground) would be provided on the site. As summarized in **Table 7**, the District’s requirements yield a need for at least 34 vehicle parking spaces for the proposed development. The number of small car parking spaces on the site may not exceed 30% of the total parking spaces. Consequently, these requirements will be met.

**Table 7 – Zoning Bylaw No. 4662, 2010 Parking Requirements**

Land Use	Parking Ratio	Independent Variable	Parking Spaces
Assisted Living	1 parking space for every 3.3 beds, minimum	110 beds	34

Notes: Zoning Bylaw No. 4662, 2010, PH1 – Private Hospital 1, p 550-2

**Table 8** compares the peak parking demand from the ITE *Parking Generation, 4<sup>th</sup> Edition* and a Lower Mainland assisted living facility.

**Table 8 – Parking Demand at Supportive Living and Memory Care Communities**

Source	Independent Variable	Parking Ratio	Peak Period Parking Demand	Notes
ITE	110 occupied beds	0.35 spaces per bed	39 spaces	1
Nikkei Place	110 occupied beds	0.36 spaces per bed	40 spaces	2

Notes: 1 – Land Use 254: Assisted Living, *Parking Generation, 4<sup>th</sup> Edition* (Washington, DC: Institute of Transportation Engineers, 2010)  
 2 – Parking Utilization Survey of 72-bed Nikkei Home (Assisted Living), Burnaby, BC (Vancouver, BC: MMM Group (formerly ND LEA), May 2003)

Key findings include:

- ✓ At comparable Supportive Living and Memory Care Communities, the average peak parking demand varies from 0.35 to 0.36 parking spaces per bed
- ✓ At 0.36 parking spaces per bed, the proposed parking supply at 707 Keith Road equals the typical parking demand at comparable facilities (i.e. 0.35 to 0.36 parking spaces per bed)



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## RECOMMENDATIONS

In light of the findings, the following recommendations are forwarded for consideration:

1. Limit movements at the site driveway to right-in / right-out through signage.
2. Revisit the design of the loading area with a view to adding engineering controls (preferred); such as traffic signals, parabolic mirrors, etc.; or providing administrative controls (least preferred) such as having staff stop traffic while trucks manoeuvre around the loading area.

## SUMMARY AND CONCLUSIONS

A 92-suite / 110-resident Supportive Living and Memory Care community is proposed for the northwest corner of Keith Road and Taylor Way in West Vancouver. Access to the eight surface and 32 underground parking spaces would be provided from a right-in / right-out driveway located on Keith Road. The site is currently occupied by two single-family dwelling units.

- ✓ When completed, the development is expected to add 25 new vehicle trips (= 19 entering + 6 exiting) to the road network during the weekday AM peak hour of adjacent street traffic and 31 vehicle trips (= 12 entering + 19 exiting) during the PM peak hour.
- ✓ An operational analysis indicated that the site driveway on Keith Road is expected to operate at acceptable levels (i.e. LOS A or better) with the proposed development. Consequently, intersection improvements do not appear to be required.
- ✓ At 35m, the proposed spacing between the site driveway and Taylor Way appears to be sufficient.
- ✓ The operational analysis indicated that the signalized intersection of Keith Road and Taylor Way currently operated at unacceptable levels (i.e. LOS E or worse) with and without the proposed development given the planned improvements.
- ✓ The north and southbound left-turn lanes at the Keith Road / Taylor Way intersection are anticipated to accommodate future traffic volumes such that vehicle queues (generated by left-turning traffic) will not spill back into the through traffic lanes on Taylor Way.
- ✓ If forecasted traffic volumes generated by the adjacent Evelyn by Onni project materialize in 10 years, the eastbound left-turn queue may exceed available storage length during weekday peak hours. Consequently, northbound drivers leaving the site may choose to head west from the site, avoiding the Keith Road / Taylor Way intersection.
- ✓ The proposed parking supply (= 40 spaces) meets both District requirements (=34 spaces) and the peak demand observed at comparable facilities (=40 spaces).
- ✓ Improvements to the site plan and road network have been identified for consideration. These include turning restrictions at the site driveway and the design of the loading area.

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\* \* \* \* \*

Should you have any questions about our methodology, findings, recommendations or conclusions; please contact me at (604) 685-9381 or [vanweelderenf@mmm.ca](mailto:vanweelderenf@mmm.ca).

Yours truly,

**MMM Group Limited**

<original signed by>

Floris van Weelderen, P.Eng., PTOE  
Manager, Transportation Planning  
Associate Partner

Attachments:

Appendix A – Trip Generation Survey at Sunrise of Lynn Valley, North Vancouver, BC  
Appendix B – Intersection Capacity and Queuing (Synchro) Calculations

5012230-001-REP-01-Rev1 (TIS).doc

5012230-001  
 707 Keith Road - West Vancouver, BC  
 21-Nov-12  
 FWW / SW

### Trip Generation Survey - Sunrise at Lynn Valley

Land use: ITE 254 - Assisted Living  
 Address: 980 Lynn Valley Road, North Vancouver, BC  
 Date of Count: 20-Nov-12  
 Day of Week: Tuesday  
 Light: Dusk / Daylight  
 Weather: Cloudy  
 Road Surface: Damp  
 Independent Variable: 96 rooms  
 107 beds

### Weekday AM Peak Period

Time of Day	Passenger Car		Total
	Inbound	Outbound	
7:00 AM	0	1	1
7:15 AM	0	0	0
7:30 AM	0	1	1
7:45 AM	4	1	5
8:00 AM	4	1	5
8:15 AM	5	1	6
8:30 AM	3	1	4
8:45 AM	3	3	6

Heavy Vehicle		
Inbound	Outbound	Total
0	0	0
1	1	2
0	0	0
3	2	5
0	0	0
0	1	1
0	0	0
0	0	0

Total		
Inbound	Outbound	Total
0	1	1
1	1	2
0	1	1
7	3	10
4	1	5
5	2	7
3	1	4
3	3	6

Peak Hour		
Inbound	Outbound	Total
19	7	26
73%	27%	0.27
73%	27%	0.24

### Weekday AM Peak Period

Time of Day	Passenger Car		Total
	Inbound	Outbound	
4:00 PM	2	3	5
4:15 PM	3	4	7
4:30 PM	2	6	8
4:45 PM	2	3	5
5:00 PM	6	4	10
5:15 PM	3	6	9
5:30 PM	4	1	5
5:45 PM	2	4	6

Heavy Vehicle		
Inbound	Outbound	Total
0	1	1
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0

Total		
Inbound	Outbound	Total
2	4	6
3	4	7
2	6	8
2	3	5
6	4	10
3	6	9
4	1	5
2	4	6

Peak Hour		
Inbound	Outbound	Total
13	19	32
41%	59%	0.33
41%	59%	0.30

5012230-001: 707 Keith Road - West Vancouver  
Lanes, Volumes, Timings

3: TAYLOR WAY & KEITH ROAD  
2012 AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↗	↖	↕	↕	↖	↕	↕
Volume (vph)	125	26	107	133	42	95	24	619	55	106	1557	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		3%			1%			8%			-10%	
Storage Length (m)	35.0		35.0	0.0		15.0	45.0		0.0	40.0		0.0
Storage Lanes	0		0	0		1	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor						0.99					1.00	
Frt		0.944				0.850		0.988			0.996	
Flt Protected		0.976			0.963		0.950			0.950		
Satd. Flow (prot)	0	1724	0	0	1821	1607	1699	3357	0	1858	3697	0
Flt Permitted		0.428			0.548		0.096			0.266		
Satd. Flow (perm)	0	756	0	0	1036	1586	172	3357	0	520	3697	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		33				79		12			3	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		397.1			404.5			289.2			351.6	
Travel Time (s)		28.6			29.1			20.8			25.3	
Confl. Peds. (#/hr)							8					8
Confl. Bikes (#/hr)						1						1
Peak Hour Factor	0.60	0.60	0.60	0.52	0.52	0.52	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	208	43	178	256	81	183	26	680	60	116	1711	44
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	429	0	0	337	183	26	740	0	116	1755	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.02	1.02	1.02	1.01	1.01	1.01	1.05	1.05	1.05	0.94	0.94	0.94
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

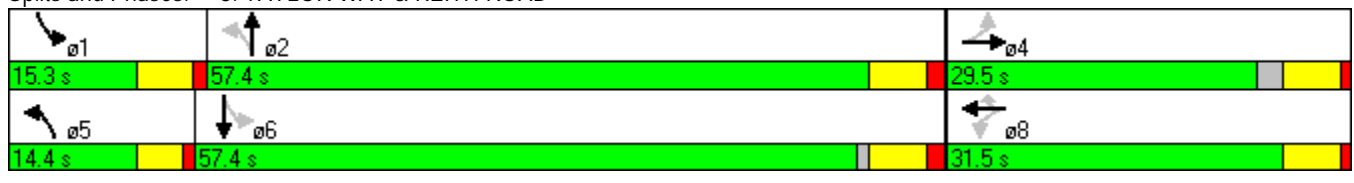


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8	2			6		
Detector Phase	4	4		8	8	8	5	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	6.0	10.0		6.0	10.0	
Minimum Split (s)	29.5	29.5		31.5	31.5	31.5	10.4	21.1		11.3	24.1	
Total Split (s)	29.5	29.5		31.5	31.5	31.5	14.4	57.4		15.3	57.4	
Total Split (%)	28.3%	28.3%		30.2%	30.2%	30.2%	13.8%	55.1%		14.7%	55.1%	
Maximum Green (s)	24.0	24.0		26.0	26.0	26.0	10.0	51.3		10.0	51.3	
Yellow Time (s)	4.5	4.5		4.5	4.5	4.5	3.5	4.6		4.3	4.6	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	0.9	1.5		1.0	1.5	
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.5			5.5	5.5	4.4	6.1		5.3	6.1	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	None	Min		None	Min	
Walk Time (s)	7.0	7.0		7.0	7.0	7.0		7.0			7.0	
Flash Dont Walk (s)	17.0	17.0		19.0	19.0	19.0		8.0			11.0	
Pedestrian Calls (#/hr)	0	0		0	0	0		0			0	
Act Effct Green (s)		26.3			26.3	26.3	47.2	38.9		52.1	48.0	
Actuated g/C Ratio		0.29			0.29	0.29	0.52	0.43		0.58	0.53	
v/c Ratio		1.77			1.12	0.35	0.13	0.51		0.28	0.89	
Control Delay		383.7			121.6	18.5	8.5	19.4		9.4	26.7	
Queue Delay		0.0			0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay		383.7			121.6	18.5	8.5	19.4		9.4	26.7	
LOS		F			F	B	A	B		A	C	
Approach Delay		383.7			85.3			19.0			25.6	
Approach LOS		F			F			B			C	

Intersection Summary

Area Type:	Other
Cycle Length:	104.2
Actuated Cycle Length:	90.2
Natural Cycle:	150
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	1.77
Intersection Signal Delay:	75.7
Intersection LOS:	E
Intersection Capacity Utilization	84.2%
ICU Level of Service	E
Analysis Period (min)	15

Splits and Phases: 3: TAYLOR WAY & KEITH ROAD





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	165	26	172	133	42	95	41	684	55	106	1720	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		3%			1%			8%				-10%
Storage Length (m)	35.0		35.0	0.0		15.0	45.0		0.0	40.0		0.0
Storage Lanes	1		1	0		1	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor						0.99					1.00	
Frt			0.850			0.850		0.989			0.996	
Flt Protected	0.950				0.963		0.950			0.950		
Satd. Flow (prot)	1778	1872	1591	0	1821	1607	1699	3360	0	1858	3697	0
Flt Permitted	0.317				0.749		0.085			0.252		
Satd. Flow (perm)	593	1872	1591	0	1416	1586	152	3360	0	493	3697	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			214			79		11			4	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		397.1			404.5			289.2			351.6	
Travel Time (s)		28.6			29.1			20.8			25.3	
Confl. Peds. (#/hr)							8					8
Confl. Bikes (#/hr)						1						1
Peak Hour Factor	0.60	0.60	0.60	0.52	0.52	0.52	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	275	43	287	256	81	183	45	752	60	116	1890	55
Shared Lane Traffic (%)												
Lane Group Flow (vph)	275	43	287	0	337	183	45	812	0	116	1945	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.02	1.02	1.02	1.01	1.01	1.01	1.05	1.05	1.05	0.94	0.94	0.94
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

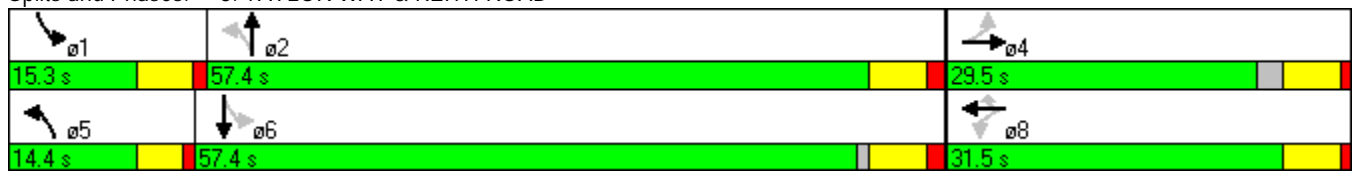


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	NA	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8	2			6		
Detector Phase	4	4		8	8	8	5	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	6.0	10.0		6.0	10.0	
Minimum Split (s)	29.5	29.5		31.5	31.5	31.5	10.4	21.1		11.3	24.1	
Total Split (s)	29.5	29.5		31.5	31.5	31.5	14.4	57.4		15.3	57.4	
Total Split (%)	28.3%	28.3%		30.2%	30.2%	30.2%	13.8%	55.1%		14.7%	55.1%	
Maximum Green (s)	24.0	24.0		26.0	26.0	26.0	10.0	51.3		10.0	51.3	
Yellow Time (s)	4.5	4.5		4.5	4.5	4.5	3.5	4.6		4.3	4.6	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	0.9	1.5		1.0	1.5	
Lost Time Adjust (s)	0.0	0.0			0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.5	5.5			5.5	5.5	4.4	6.1		5.3	6.1	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	None	Min		None	Min	
Walk Time (s)	7.0	7.0		7.0	7.0	7.0		7.0			7.0	
Flash Dont Walk (s)	17.0	17.0		19.0	19.0	19.0		8.0			11.0	
Pedestrian Calls (#/hr)	0	0		0	0	0		0			0	
Act Effct Green (s)	25.7	25.7	0.0		25.7	25.7	54.1	45.3		57.3	51.5	
Actuated g/C Ratio	0.27	0.27	0.00		0.27	0.27	0.56	0.47		0.60	0.54	
v/c Ratio	1.74	0.09	1.34		0.89	0.38	0.23	0.51		0.29	0.98	
Control Delay	382.5	28.8	194.6		61.6	19.7	9.7	18.7		9.2	39.1	
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	382.5	28.8	194.6		61.6	19.7	9.7	18.7		9.2	39.1	
LOS	F	C	F		E	B	A	B		A	D	
Approach Delay		268.2			46.9			18.2			37.4	
Approach LOS		F			D			B			D	

Intersection Summary

Area Type:	Other
Cycle Length:	104.2
Actuated Cycle Length:	95.8
Natural Cycle:	150
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	1.74
Intersection Signal Delay:	69.1
Intersection LOS:	E
Intersection Capacity Utilization:	83.7%
ICU Level of Service:	E
Analysis Period (min):	15

Splits and Phases: 3: TAYLOR WAY & KEITH ROAD





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	167	26	175	133	42	95	54	684	55	106	1720	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		3%			1%			8%			-10%	
Storage Length (m)	35.0		35.0	0.0		15.0	45.0		0.0	40.0		0.0
Storage Lanes	1		1	0		1	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor						0.99					1.00	
Frt			0.850			0.850		0.989			0.995	
Flt Protected	0.950				0.963		0.950			0.950		
Satd. Flow (prot)	1778	1872	1591	0	1821	1607	1699	3360	0	1858	3693	0
Flt Permitted	0.307				0.749		0.082			0.264		
Satd. Flow (perm)	575	1872	1591	0	1416	1586	147	3360	0	516	3693	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			214			79		11			4	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		66.0			404.5			289.2			351.6	
Travel Time (s)		4.8			29.1			20.8			25.3	
Confl. Peds. (#/hr)							8					8
Confl. Bikes (#/hr)						1						1
Peak Hour Factor	0.60	0.60	0.60	0.52	0.52	0.52	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	278	43	292	256	81	183	59	752	60	116	1890	60
Shared Lane Traffic (%)												
Lane Group Flow (vph)	278	43	292	0	337	183	59	812	0	116	1950	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.02	1.02	1.02	1.01	1.01	1.01	1.05	1.05	1.05	0.94	0.94	0.94
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												



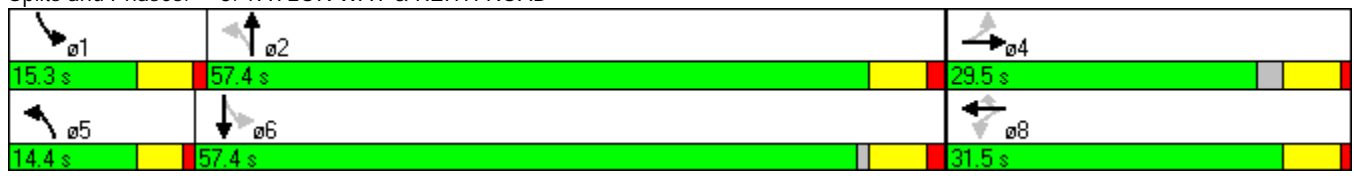


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	NA	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8	2			6		
Detector Phase	4	4		8	8	8	5	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	6.0	10.0		6.0	10.0	
Minimum Split (s)	29.5	29.5		31.5	31.5	31.5	10.4	21.1		11.3	24.1	
Total Split (s)	29.5	29.5		31.5	31.5	31.5	14.4	57.4		15.3	57.4	
Total Split (%)	28.3%	28.3%		30.2%	30.2%	30.2%	13.8%	55.1%		14.7%	55.1%	
Maximum Green (s)	24.0	24.0		26.0	26.0	26.0	10.0	51.3		10.0	51.3	
Yellow Time (s)	4.5	4.5		4.5	4.5	4.5	3.5	4.6		4.3	4.6	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	0.9	1.5		1.0	1.5	
Lost Time Adjust (s)	0.0	0.0			0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.5	5.5			5.5	5.5	4.4	6.1		5.3	6.1	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	None	Min		None	Min	
Walk Time (s)	7.0	7.0		7.0	7.0	7.0		7.0			7.0	
Flash Dont Walk (s)	17.0	17.0		19.0	19.0	19.0		8.0			11.0	
Pedestrian Calls (#/hr)	0	0		0	0	0		0			0	
Act Effct Green (s)	25.6	25.6	0.0		25.6	25.6	57.4	48.0		58.8	51.5	
Actuated g/C Ratio	0.26	0.26	0.00		0.26	0.26	0.58	0.49		0.60	0.52	
v/c Ratio	1.87	0.09	1.36		0.92	0.39	0.29	0.49		0.28	1.01	
Control Delay	438.4	29.7	204.4		67.6	20.4	10.6	18.1		9.0	48.1	
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	438.4	29.7	204.4		67.6	20.4	10.6	18.1		9.0	48.1	
LOS	F	C	F		E	C	B	B		A	D	
Approach Delay		298.3			51.0			17.6			45.9	
Approach LOS		F			D			B			D	

Intersection Summary

Area Type:	Other
Cycle Length:	104.2
Actuated Cycle Length:	98.5
Natural Cycle:	150
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	1.87
Intersection Signal Delay:	78.5
Intersection LOS:	E
Intersection Capacity Utilization:	83.9%
ICU Level of Service:	E
Analysis Period (min):	15

Splits and Phases: 3: TAYLOR WAY & KEITH ROAD





Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↔			↗
Volume (vph)	0	363	133	20	0	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)		3%	0%		0%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.982			0.865
Flt Protected						
Satd. Flow (prot)	0	1835	1829	0	0	1611
Flt Permitted						
Satd. Flow (perm)	0	1835	1829	0	0	1611
Link Speed (k/h)		50	50		50	
Link Distance (m)		284.5	66.0		54.2	
Travel Time (s)		20.5	4.8		3.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	395	145	22	0	8
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	395	167	0	0	8
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		0.0	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.02	1.02	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	22.4%
Analysis Period (min)	15
	ICU Level of Service A



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕↔		↕	↕↔	
Volume (vph)	87	19	49	27	20	30	55	1587	38	22	801	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1000	1900
Grade (%)		3%			1%			8%			-10%	
Storage Length (m)	35.0		35.0	0.0		15.0	45.0		0.0	40.0		0.0
Storage Lanes	0		0	0		1	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor		0.99			1.00		1.00	1.00			1.00	
Frt		0.958				0.850		0.997			0.995	
Flt Protected		0.973			0.972		0.950			0.950		
Satd. Flow (prot)	0	1562	0	0	1654	1446	1529	3047	0	1672	1749	0
Flt Permitted		0.789			0.750		0.255			0.071		
Satd. Flow (perm)	0	1266	0	0	1274	1446	409	3047	0	125	1749	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		21				79		3			5	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		397.1			404.5			289.2			351.6	
Travel Time (s)		28.6			29.1			20.8			25.3	
Confl. Peds. (#/hr)			4	4			5		2	2		5
Peak Hour Factor	0.84	0.84	0.84	0.71	0.71	0.71	0.92	0.92	0.92	0.90	0.90	0.90
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	104	23	58	38	28	42	60	1725	41	24	890	31
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	185	0	0	66	42	60	1766	0	24	921	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.17	1.17	1.17	1.15	1.15	1.15	1.20	1.20	1.20	1.08	2.31	1.08
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

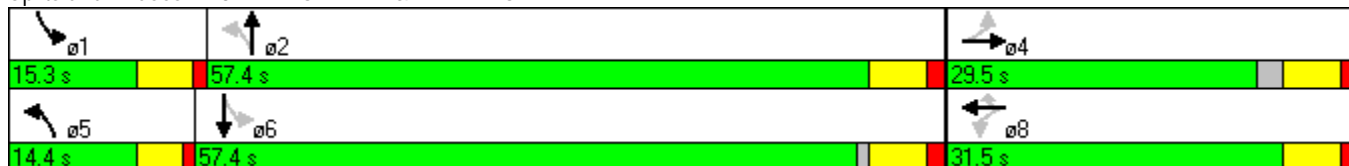


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8	2			6		
Detector Phase	4	4		8	8	8	5	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	6.0	10.0		6.0	10.0	
Minimum Split (s)	29.5	29.5		31.5	31.5	31.5	10.4	21.1		11.3	24.1	
Total Split (s)	29.5	29.5		31.5	31.5	31.5	14.4	57.4		15.3	57.4	
Total Split (%)	28.3%	28.3%		30.2%	30.2%	30.2%	13.8%	55.1%		14.7%	55.1%	
Maximum Green (s)	24.0	24.0		26.0	26.0	26.0	10.0	51.3		10.0	51.3	
Yellow Time (s)	4.5	4.5		4.5	4.5	4.5	3.5	4.6		4.3	4.6	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	0.9	1.5		1.0	1.5	
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.5			5.5	5.5	4.4	6.1		5.3	6.1	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	None	Min		None	Min	
Walk Time (s)	7.0	7.0		7.0	7.0	7.0		7.0			7.0	
Flash Dont Walk (s)	17.0	17.0		19.0	19.0	19.0		8.0			11.0	
Pedestrian Calls (#/hr)	0	0		0	0	0		0			0	
Act Effect Green (s)		16.8			16.8	16.8	63.4	58.7		59.7	54.0	
Actuated g/C Ratio		0.18			0.18	0.18	0.69	0.64		0.65	0.59	
v/c Ratio		0.75			0.28	0.13	0.16	0.90		0.13	0.89	
Control Delay		49.5			34.8	2.5	6.2	25.3		7.2	32.0	
Queue Delay		0.0			0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay		49.5			34.8	2.5	6.2	25.3		7.2	32.0	
LOS		D			C	A	A	C		A	C	
Approach Delay		49.5			22.3			24.7			31.3	
Approach LOS		D			C			C			C	

Intersection Summary

Area Type:	CBD
Cycle Length:	104.2
Actuated Cycle Length:	91.6
Natural Cycle:	110
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.90
Intersection Signal Delay:	28.1
Intersection LOS:	C
Intersection Capacity Utilization:	81.4%
ICU Level of Service:	D
Analysis Period (min):	15

Splits and Phases: 3: TAYLOR WAY & KEITH ROAD





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	110	19	87	27	20	30	126	1753	38	22	885	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1000	1900
Grade (%)		3%			1%			8%			-10%	
Storage Length (m)	35.0		35.0	0.0		15.0	45.0		0.0	40.0		0.0
Storage Lanes	1		1	0		1	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor			0.98		1.00		1.00	1.00			1.00	
Frt			0.850			0.850		0.997			0.989	
Flt Protected	0.950				0.972		0.950			0.950		
Satd. Flow (prot)	1600	1684	1432	0	1654	1446	1529	3047	0	1672	1737	0
Flt Permitted	0.714				0.821		0.196			0.073		
Satd. Flow (perm)	1203	1684	1407	0	1393	1446	315	3047	0	129	1737	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			104			79		3			11	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		397.1			404.5			289.2			351.6	
Travel Time (s)		28.6			29.1			20.8			25.3	
Confl. Peds. (#/hr)			4	4			5		2	2		5
Peak Hour Factor	0.84	0.84	0.84	0.71	0.71	0.71	0.92	0.92	0.92	0.90	0.90	0.90
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	131	23	104	38	28	42	137	1905	41	24	983	79
Shared Lane Traffic (%)												
Lane Group Flow (vph)	131	23	104	0	66	42	137	1946	0	24	1062	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.17	1.17	1.17	1.15	1.15	1.15	1.20	1.20	1.20	1.08	2.31	1.08
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8	2			6		
Detector Phase	4	4	4	8	8	8	5	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	6.0	10.0		6.0	10.0	
Minimum Split (s)	29.5	29.5	29.5	31.5	31.5	31.5	10.4	21.1		11.3	24.1	
Total Split (s)	29.5	29.5	29.5	31.5	31.5	31.5	14.4	57.4		15.3	57.4	
Total Split (%)	28.3%	28.3%	28.3%	30.2%	30.2%	30.2%	13.8%	55.1%		14.7%	55.1%	
Maximum Green (s)	24.0	24.0	24.0	26.0	26.0	26.0	10.0	51.3		10.0	51.3	
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	3.5	4.6		4.3	4.6	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	0.9	1.5		1.0	1.5	
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.5	5.5	5.5		5.5	5.5	4.4	6.1		5.3	6.1	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
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	None	None	None	Min		None	Min	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0		7.0			7.0	
Flash Dont Walk (s)	17.0	17.0	17.0	19.0	19.0	19.0		8.0			11.0	
Pedestrian Calls (#/hr)	0	0	0	0	0	0		0			0	
Act Effect Green (s)	15.1	15.1	15.1		15.1	15.1	65.5	60.1		58.6	51.5	
Actuated g/C Ratio	0.17	0.17	0.17		0.17	0.17	0.72	0.66		0.64	0.56	
v/c Ratio	0.66	0.08	0.33		0.29	0.14	0.40	0.97		0.13	1.08	
Control Delay	51.8	32.1	9.6		36.3	2.7	8.2	32.4		6.8	74.8	
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	51.8	32.1	9.6		36.3	2.7	8.2	32.4		6.8	74.8	
LOS	D	C	A		D	A	A	C		A	E	
Approach Delay		33.0			23.2			30.8			73.3	
Approach LOS		C			C			C			E	

Intersection Summary

Area Type:	CBD
Cycle Length:	104.2
Actuated Cycle Length:	91.3
Natural Cycle:	130
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	1.08
Intersection Signal Delay:	43.8
Intersection LOS:	D
Intersection Capacity Utilization:	91.8%
ICU Level of Service:	F
Analysis Period (min):	15

Splits and Phases: 3: TAYLOR WAY & KEITH ROAD





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	115	19	97	27	20	30	134	1753	38	22	885	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1000	1900
Grade (%)		3%			1%			8%			-10%	
Storage Length (m)	35.0		35.0	0.0		15.0	45.0		0.0	40.0		0.0
Storage Lanes	1		1	0		1	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor			0.98		1.00		1.00	1.00			1.00	
Frt			0.850			0.850		0.997			0.988	
Flt Protected	0.950				0.972		0.950			0.950		
Satd. Flow (prot)	1600	1684	1432	0	1654	1446	1529	3047	0	1672	1735	0
Flt Permitted	0.714				0.822		0.193			0.073		
Satd. Flow (perm)	1203	1684	1407	0	1395	1446	310	3047	0	129	1735	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			115			79		3			12	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		43.4			404.5			289.2			351.6	
Travel Time (s)		3.1			29.1			20.8			25.3	
Confl. Peds. (#/hr)			4	4			5		2	2		5
Peak Hour Factor	0.84	0.84	0.84	0.71	0.71	0.71	0.92	0.92	0.92	0.90	0.90	0.90
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	137	23	115	38	28	42	146	1905	41	24	983	83
Shared Lane Traffic (%)												
Lane Group Flow (vph)	137	23	115	0	66	42	146	1946	0	24	1066	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.17	1.17	1.17	1.15	1.15	1.15	1.20	1.20	1.20	1.08	2.31	1.08
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

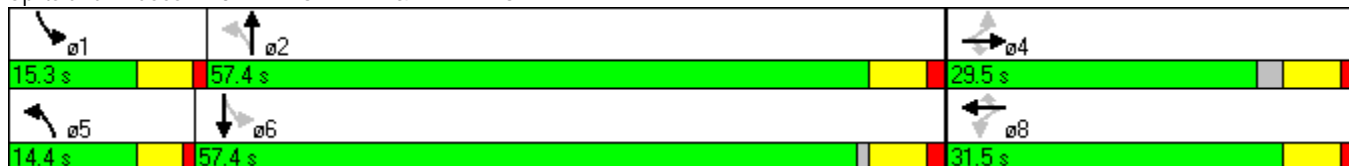


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8	2			6		
Detector Phase	4	4	4	8	8	8	5	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	6.0	10.0		6.0	10.0	
Minimum Split (s)	29.5	29.5	29.5	31.5	31.5	31.5	10.4	21.1		11.3	24.1	
Total Split (s)	29.5	29.5	29.5	31.5	31.5	31.5	14.4	57.4		15.3	57.4	
Total Split (%)	28.3%	28.3%	28.3%	30.2%	30.2%	30.2%	13.8%	55.1%		14.7%	55.1%	
Maximum Green (s)	24.0	24.0	24.0	26.0	26.0	26.0	10.0	51.3		10.0	51.3	
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	3.5	4.6		4.3	4.6	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	0.9	1.5		1.0	1.5	
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.5	5.5	5.5		5.5	5.5	4.4	6.1		5.3	6.1	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
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	None	None	None	Min		None	Min	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0		7.0			7.0	
Flash Dont Walk (s)	17.0	17.0	17.0	19.0	19.0	19.0		8.0			11.0	
Pedestrian Calls (#/hr)	0	0	0	0	0	0		0			0	
Act Effect Green (s)	15.6	15.6	15.6		15.6	15.6	65.8	60.4		58.6	51.6	
Actuated g/C Ratio	0.17	0.17	0.17		0.17	0.17	0.71	0.66		0.64	0.56	
v/c Ratio	0.67	0.08	0.34		0.28	0.14	0.43	0.97		0.13	1.09	
Control Delay	52.3	31.9	9.3		35.9	2.7	8.9	33.5		7.0	80.0	
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	52.3	31.9	9.3		35.9	2.7	8.9	33.5		7.0	80.0	
LOS	D	C	A		D	A	A	C		A	F	
Approach Delay		32.6			23.0			31.8			78.4	
Approach LOS		C			C			C			E	

Intersection Summary

Area Type:	CBD
Cycle Length:	104.2
Actuated Cycle Length:	92.1
Natural Cycle:	130
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	1.09
Intersection Signal Delay:	45.8
Intersection LOS:	D
Intersection Capacity Utilization:	92.8%
ICU Level of Service:	F
Analysis Period (min):	15

Splits and Phases: 3: TAYLOR WAY & KEITH ROAD







Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↔			↗
Volume (vph)	0	230	217	13	0	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)		3%	0%		0%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.992			0.865
Flt Protected						
Satd. Flow (prot)	0	1835	1848	0	0	1611
Flt Permitted						
Satd. Flow (perm)	0	1835	1848	0	0	1611
Link Speed (k/h)		50	50		50	
Link Distance (m)		342.6	43.4		66.0	
Travel Time (s)		24.7	3.1		4.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	250	236	14	0	22
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	250	250	0	0	22
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		0.0	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.02	1.02	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	22.2%
Analysis Period (min)	15
	ICU Level of Service A