Appendix B9

Traffic Impact Assessment Report

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1 Introduction

The Region of Waterloo (the Region) has planned a staged Light Rail Transit (LRT) from Waterloo to Cambridge. The Region's rapid transit system, named ION, is being implemented in two stages: Stage 1 ION includes LRT from Waterloo to Kitchener and adapted Bus Rapid Transit from Kitchener to Cambridge; Stage 2 ION will replace the bus service, creating a continuous LRT system in the Region, connecting three urban centres. WSP was retained by the Region to assist in project management and provide technical supports in this study.

After evaluating and analyzing different route options, a 'Preferred Route for Stage 2 ION' was endorsed by the Regional Council in June 2019. For this preferred LRT route, a traffic impact assessment was conducted for 21 signalized intersections located on the proposed LRT corridor.

This report documents the methodology and findings of the future (2031) traffic analysis with the proposed Stage 2 ION LRT operations.

2 Study Area Intersections

A total of 21 intersections (including 17 existing intersections operating with traffic signals and 4 intersections which are proposed to operate with traffic signals) along the preferred Stage 2 ION LRT route were included in the traffic capacity analysis. The study area includes the following intersections:

1. King Street and Deer Ridge Drive
2. King Street and Sportsworld Crossing Road
3. King Street and Sportsworld Drive/ Baxter Place
4. King Street and Tu-Lane Street
5. King Street and Highway 401 WB Off-Ramp*
6. King Street and Highway 401 EB Off-Ramp*
7. Shantz Hill Road and Preston Parkway
8. King Street and Eagle Street
9. Hespeler Road and 605/611 Hespeler Road (Travelodge) Access
10. Hespeler Road and 561 Hespeler Road (Party City) Access
11. Hespeler Road and Langs Drive/ Sheldon Drive
12. Hespeler Road and 480 Hespeler Road (Value Village) Access
13. Hespeler Road and Bishop Street
14. Hespeler Road and Cambridge Centre Access
15. Hespeler Road and Dunbar Road
16. Hespeler Road and Can-Amera Parkway
17. Hespeler Road and Isherwood Avenue/ Munch Ave
18. Hespeler Road and Avenue Road/ Jaffray Street
19. Wellington Street and Main Street
20. Wellington Street and Bruce Street*
21. Bruce Street and Ainslie Street*

Note: * - intersections proposed to operate with traffic signals in the future condition

The locations of the study area intersections are presented in Figure 1.

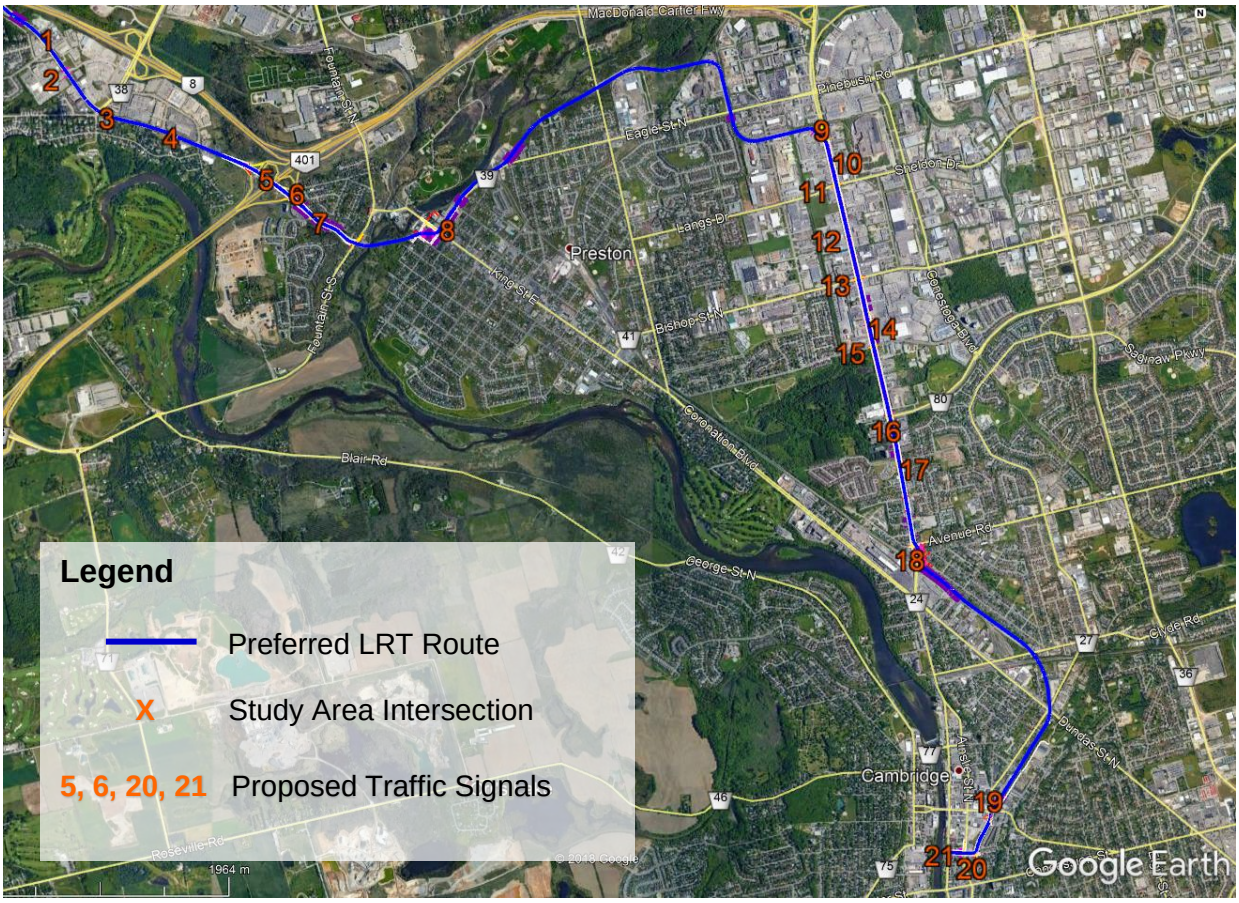


Figure 1: Intersections included in Traffic Analysis

3 Methodology and Assumptions

Existing turning movement counts (TMCs) for the study area intersections were received for both the morning and afternoon peak hour conditions. These counts were collected from 2012 to 2018. The existing signal timing plans for the afternoon peak hour were extracted from a Synchro model received from the Region in 2015.

For the future (2031) traffic analyses, signal timing plans were optimized while existing yellow time, all-red time, and protected/permissive phase settings were kept unchanged. The Region of Waterloo suggests considering 4 seconds of total lost time for Synchro analysis conducted for the planning studies. It is noted that the traffic analysis conducted for this study assumes the total lost time between five to eight seconds, which represents slightly more conservative delays.

The Region's travel demand models (Visum-based) were received for the existing (2011) and future (2031) conditions. The Region's travel demand model provides vehicular traffic demands (auto, medium trucks, and heavy trucks) for both morning and afternoon peak hour conditions. The traffic impact assessment was conducted for the future (2031) peak hour conditions using Synchro software.

The LRT operation assumptions considered in this study include:

- Eight-minute headway during both morning and afternoon peak hours;
- For the intersections with center-running LRT, the analysis assumed that LRT will operate in the same phase with a through traffic traveling on a major street (e.g. along King Street near Sportsworld, and along Hespeler Road), and the left-turn movement on a major street will operate under a protected phase only (e.g. northbound and southbound left turns at Hespeler Road and Langs Drive/ Sheldon Drive), which is a similar situation as Stage 1 ION LRT operation at the intersection of Northfield Drive and Colby Drive in the City of Cambridge in Waterloo Region;
- For the following five intersections where LRT is transferring between on-street and off-street running, a split-signal phase is considered for the LRT operation:

  #8 King Street and Eagle Street,

  #9 Hespeler Road and Travelodge Access,

  #18 Hespeler Road and Avenue Road/ Jaffray Street,

  #19 Wellington Street and Main Street, and

  #20 Bruce Street and Wellington Street;
- The analysis assumes 40 seconds of gate closure time for LRT with an activated split-phase for the above mentioned five intersections, which is expected to cause at least 300 seconds of delay (which is derived considering 60 minutes divided by 8-minute headway and multiplying 40-second of gate closure time). However, this delay could extend up to 600 seconds in a worst-case scenario when LRT in both directions does not approach simultaneously. To capture the vehicular delays caused by the gate closure at the above mentioned five

intersections, the analysis assumes the 300 seconds of ‘all-red’ time for vehicles, which was equally distributed to each cycle during peak hours.

It is noted that the traffic analysis results and findings presented in this memo were derived based upon the above described LRT operation assumptions. The objective is to illustrate future traffic operating conditions at a high-level. Should any assumptions not applicable to the future LRT operations and further detailed analysis, the analysis results and findings may no longer be valid. More detailed traffic operational analysis using micro-simulation models (e.g., Vissim or Aimsun) may need to be conducted in the next study phase.

4 Future (2031) Traffic Demands

The future (2031) peak hour vehicular traffic demands for the study area intersections were estimated based on the existing traffic pattern derived using the turning movement counts, and the vehicular link volumes for the study area intersections (i.e., approaching and leaving volumes at intersections) extracted from the existing and future travel demand models. The traffic volume differences between existing (2011) and future (2031) models were calculated, and the net traffic growths were derived for each intersection and applied to the existing TMCs (based on the year of traffic data collected i.e. 2012- 2018). The future turning movement volumes were estimated using a 'bi-proportional balancing' methodology which considers both the total approaching and leaving traffic volumes (as referred in the NCHRP Report 255).

The estimated future volumes were further adjusted at following three intersections to reflect future lane closure:

- King Street and Eagle Street intersection: the existing west approach (Eagle Street west of King Street) is proposed to be converted into a ‘one-way’ street leaving the intersection. The future eastbound traffic is expected to divert to the adjacent intersections on King Street, as presented in Figure 2. Potentially, the existing pedestrian signal at King Street and Waterloo Street intersection could be converted into full traffic signals to facilitate future traffic diversion.

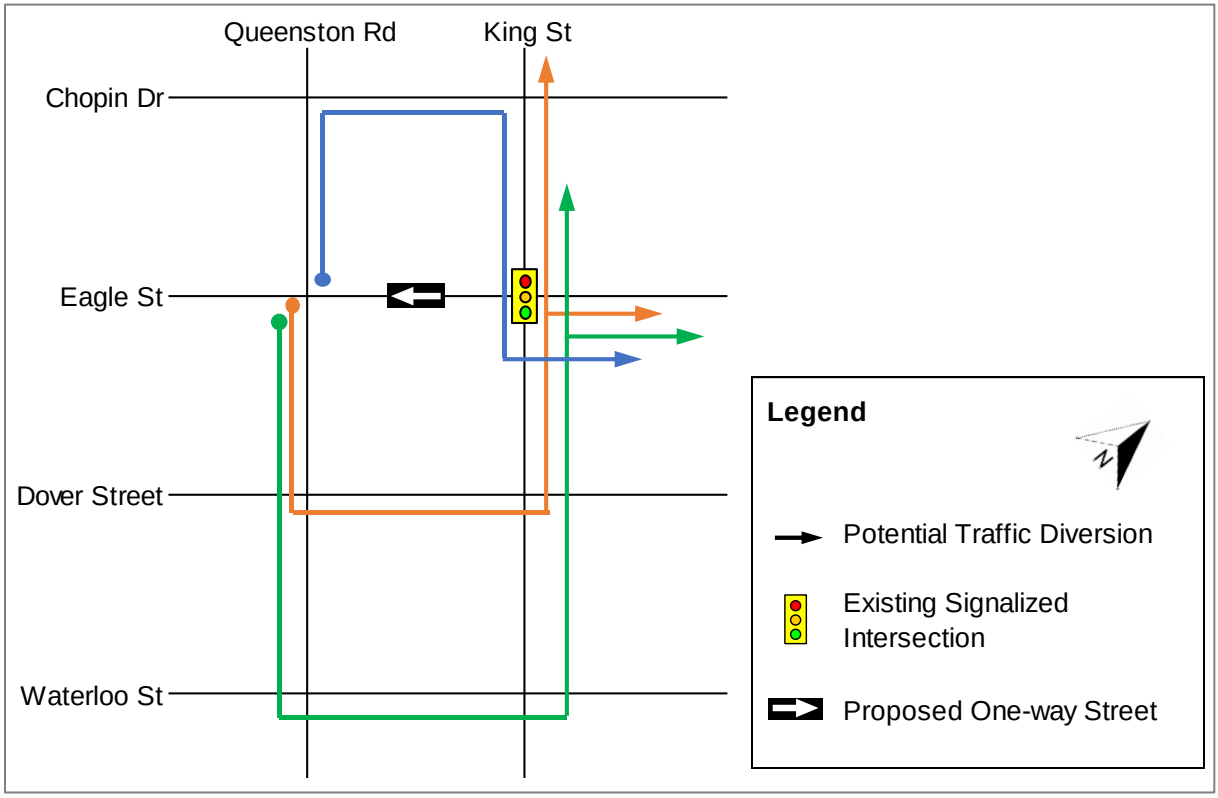


Figure 2: Potential Traffic Diversion at King Street and Eagle Street Intersection

- Wellington Street and Bruce Street intersection: the existing west approach (Bruce Street west of Wellington Street) is proposed to be converted into a 'one-way' street approaching the intersection. The future westbound through, northbound left, and southbound right traffic is expected to divert to the adjacent intersections on Wellington Street, as presented in Figure 3.

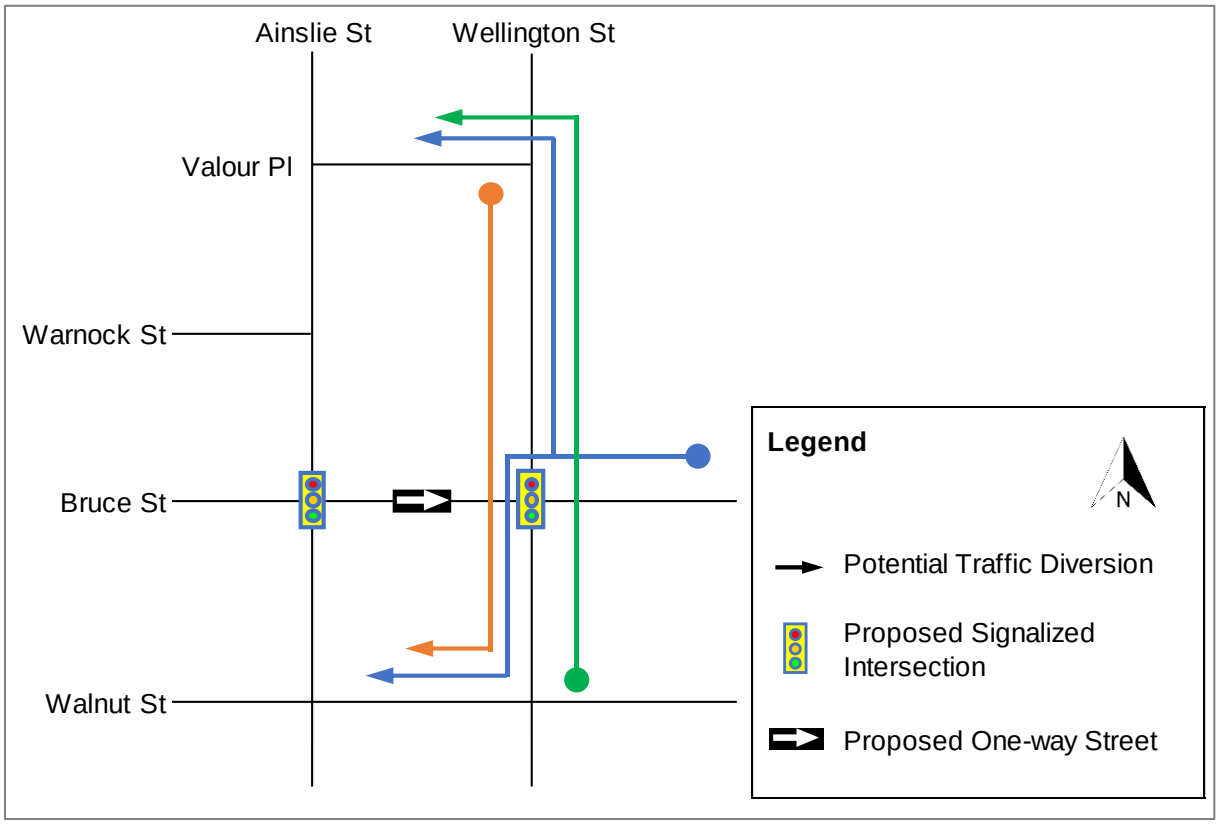


Figure 3: Potential Traffic Diversion at Wellington Street and Bruce Street Intersection

- Bruce Street and Ainslie Street intersection: the existing west approach (Bruce Street west of Ainslie Street) is proposed to be converted into a transit terminal. The future traffic using the west approach is expected to divert to the adjacent intersections on Ainslie Street, as presented in Figure 4.

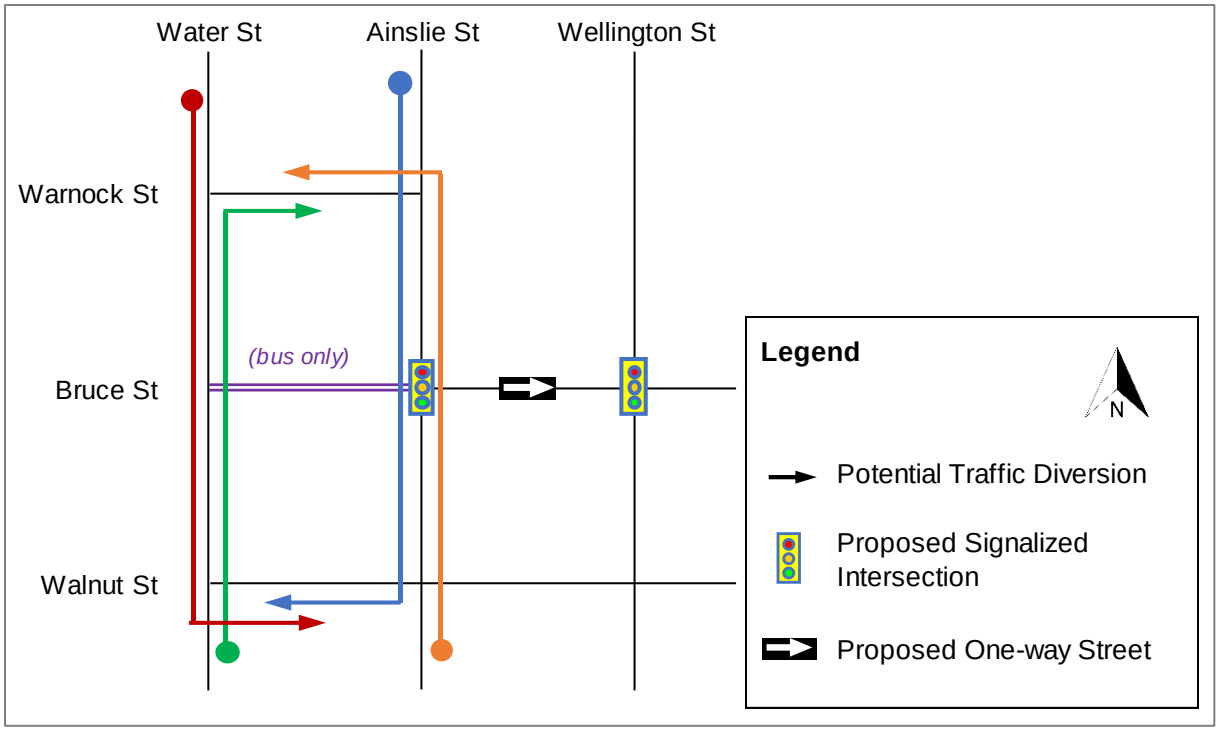


Figure 4: Potential Traffic Diversion at Bruce Street and Ainslie Street Intersection

The estimated future (2031) peak-hour traffic volumes are presented in Appendix A for the study area intersections.

5 Future Intersection Capacity Analysis

Future (2031) intersection capacity analysis was conducted using Synchro software. The future intersections lane configurations with the LRT scenario were coded in the Synchro model and the future signal timing plans were developed and/or optimized to minimize vehicular delays and potential operational impacts due to the proposed LRT. For the intersections where turning movement counts were available with 15-min intervals, the peak hour factors (PHFs) were calculated and used in Synchro model. For the intersections where TMCs with 15-min intervals were not available, the PHFs applied in the Region's Synchro model (received from the Region in 2015) were used for this analysis.

The future (2031) intersection capacity analysis results are summarized in Table 1 and Table 2 for the morning and afternoon peak hour condition, respectively. The critical movements (i.e. an individual movement expected to operate at LOS E/F) and operating delays and queue lengths are also presented in these tables. Detailed Synchro reports for the future (2031) morning and afternoon peak hours, summarizing overall intersection delays and movement delays, level of services (LOS), volume to capacity (v/c) ratios, and 95th percentile queue lengths are included in Appendix B.

Table 1: Future (2031) Intersection Capacity Analysis Results – AM Peak Hour

Intersection	Control Type	2031 AM Peak Hour		
		Overall LOS (Delay in s)	Critical Movements (v/c) LOS (Delay)	95th Percentile Queues (m)
King St & Deer Ridge Dr	Signalized	D (46)	EB-L (1.04) F (108) NB-L (1.01) F (149) SB-L (0.30) E (78) SB-T (1.01) E (57)	184 85 15 352
King St & Sportsworld Crossing Rd	Signalized	C (22)	EB-L (0.60) F (87) WB-L (0.20) E (66) SB-L (0.39) E (68)	23 9 44
King St & Baxter Pl/Sportsworld Dr	Signalized	D (39)	EB-L (0.54) E (73) WB-L (0.95) F (101) WB-TL (0.93) F (96) NB-L (0.57) E (73) SB-L (0.47) F (85)	32 134 135 50 22
King St & Tu Ln St	Signalized	B (13)	WB-LR (0.59) E (62) SB-L (0.34) E (56)	31 13
King St & Hwy 401 WB Off-Ramp	Signalized	C (23)	WB-R (0.87) E (56)	120

Intersection	Control Type	2031 AM Peak Hour		
		Overall LOS (Delay in s)	Critical Movements (v/c) LOS (Delay)	95th Percentile Queues (m)
King St & Hwy 401 EB Off-Ramp	Signalized	E (67)	EB-L (1.04) F (94) NB-T (1.05) F (83) SB-L (1.04) F (95)	208 190 202
Shantz Hill Rd & Preston Pkwy	Signalized	C (22)	NB-L (0.44) E (61)	24
King St & Eagle St	Signalized	D (38)		
Hespeler Rd & Travelodge Access	Signalized	C (29)	EB-L (0.65) E (79) NB-L (0.38) E (77) SB-L (0.24) E (71)	47 23 16
Hespeler Rd & Party City Access	Signalized	A (8)	EB-L (0.43) E (73) WB-L (0.50) E (76) NB-L (0.30) E (74) SB-L (0.54) F (88)	26 31 16 30
Hespeler Rd & Langs Dr/ Sheldon Drive	Signalized	C (26)	EB-TR (0.66) E (57) WB-L (0.98) F (130) NB-L (0.64) F (81) SB-L (0.75) F (93)	71 60 50 71
Hespeler Rd & Value Village Access	Signalized	B (12)	EB-L (0.36) E (72) WB-L (0.25) E (68) SB-L (0.38) E (67)	21 16 20
Hespeler Rd & Bishop St	Signalized	D (41)	EB-L (0.86) E (76) EB-T (0.78) E (68) WB-T (0.79) E (72) NB-L (0.75) E (79) SB-L (0.81) F (88)	64 98 97 78 99
Hespeler Rd & Cambridge Centre	Signalized	A (6)	EB-L (0.05) E (63) WB-L (0.16) E (67) NB-L (0.12) E (65) SB-L (0.56) F (82)	5 11 5 37
Hespeler Rd & Dunbar Rd	Signalized	C (32)	EB-L (0.61) E (79) EB-T (0.64) E (74) WB-L (0.55) E (59) NB-L (0.79) E (57) SB-L (0.65) F (86)	36 54 39 92 51

Intersection	Control Type	2031 AM Peak Hour		
		Overall LOS (Delay in s)	Critical Movements (v/c) LOS (Delay)	95th Percentile Queues (m)
Hespeler Rd & Can-Amera Pkwy	Signalized	D (40)	EB-L (0.26) E (68) EB-T (0.19) E (64) WB-L (1.50) F (288) NB-L (0.46) E (71) SB-L (0.48) F (94)	12 12 187 30 38
Hespeler Rd & Isherwood Ave/Munch Ave	Signalized	C (24)	EB-L (1.47) F (326) NB-L (0.31) F (94) SB-L (0.49) E (72)	59 9 29
Hespeler Rd & Jaffray St/Avenue Rd	Signalized	D (44)	WB-L (0.83) E (78) NB-L (0.21) E (73) SB-L (0.89) F (138)	79 12 48
Wellington St & Main St	Signalized	C (22)		
Bruce St & Wellington St	Signalized	B (15)		
Bruce St & Ainslie St	Signalized	A (9)		

Table 2: Future (2031) Intersection Capacity Analysis Results – PM Peak Hour

Intersection	Control Type	2031 PM Peak Hour		
		Overall LOS (Delay in s)	Critical Movements (v/c) LOS (Delay)	95th Percentile Queues (m)
King St & Deer Ridge Dr	Signalized	F (82)	EB-L (1.15) F (146) NB-L (1.23) F (209) SB-L (0.42) F (86) SB-T (1.21) F (129)	181 81 19 507
King St & Sportsworld Crossing Rd	Signalized	B (14)	EB-L (0.58) E (74) EB-TR (0.80) E (59) WB-L (0.31) E (64) NB-L (0.52) F (87) SB-L (0.34) E (76)	26 55 13 31 32
King St & Baxter Pl/Sportsworld Dr	Signalized	E (56)	EB-L (0.42) E (72) WB-L (0.99) F (111) WB-TL (0.98) F (107) SB-T (0.98) E (64)	28 126 127 282
King St & Tu Ln St	Signalized	C (26)	WB-LR (0.94) E (73) SB-L (0.44) F (89)	117 14
King St & Hwy 401 WB Off-Ramp	Signalized	E (56)	WB-R (1.12) F (108) SB-T (1.03) E (60)	261 312
King St & Hwy 401 EB Off-Ramp	Signalized	E (61)	EB-L (0.97) E (76) NB-T (1.02) E (79) SB-L (1.15) F (126)	192 171 242
Shantz Hill Rd & Preston Pkwy	Signalized	C (21)	NB-L (0.53) E (63)	36
King St & Eagle St	Signalized	C (31)		
Hespeler Rd & Travelodge Access	Signalized	C (32)	EB-L (0.75) E (78) NB-L (0.70) F (92) SB-L (0.30) E (73)	65 42 18
Hespeler Rd & Party City Access	Signalized	B (12)	EB-L (0.71) F (94) WB-L (0.51) E (71) NB-L (0.50) E (66) SB-L (0.55) E (79)	38 36 24 34

Intersection	Control Type	2031 PM Peak Hour		
		Overall LOS (Delay in s)	Critical Movements (v/c) LOS (Delay)	95th Percentile Queues (m)
Hespeler Rd & Langs Dr/ Sheldon Drive	Signalized	D (42)	EB-L (0.67) E (64) WB-L (1.00) F (122) NB-L (0.79) F (101) SB-L (0.93) F (120)	48 84 71 90
Hespeler Rd & Value Village Access	Signalized	B (17)	EB-L (0.65) E (79) WB-L (0.53) E (79) NB-L (0.64) E (76)	45 27 39
Hespeler Rd & Bishop St	Signalized	E (70)	EB-L (1.08) F (122) EB-T (0.80) E (63) WB-T (1.02) F (99) NB-L (1.04) F (133) NB-TR (1.02) E (64) SB-L (1.00) F (117) SB-TR (1.02) E (62)	105 154 188 125 267 121 267
Hespeler Rd & Cambridge Centre	Signalized	A (8)	EB-L (0.19) E (66) WB-L (0.38) E (73) NB-L (0.13) E (58) SB-L (0.63) E (60)	13 23 5 37
Hespeler Rd & Dunbar Rd	Signalized	E (61)	EB-L (0.49) E (61) EB-T (0.76) E (71) WB-L (1.20) F (167) NB-L (0.73) E (79) SB-L (0.75) E (74) SB-TR (1.01) F (86)	40 91 117 56 92 290
Hespeler Rd & Can-Amera Pkwy	Signalized	F (128)	EB-L (0.50) E (75) EB-T (0.20) E (61) WB-L (2.07) F (520) NB-L (0.43) E (75) NB-TR (1.20) F (109)	26 17 358 20 381
Hespeler Rd & Isherwood Ave/Munch Ave	Signalized	D (55)	EB-L (1.14) F (189) NB-L (0.19) F (94) NB-TR (1.10) F (85) SB-L (1.06) E (76)	69 4 304 131
Hespeler Rd & Jaffray St/Avenue Rd	Signalized	D (44)	WB-L (0.78) E (77) NB-L (0.16) E (72) SB-L (0.92) F (128)	70 9 46

Intersection	Control Type	2031 PM Peak Hour		
		Overall LOS (Delay in s)	Critical Movements (v/c) LOS (Delay)	95th Percentile Queues (m)
Wellington St & Main St	Signalized	C (29)		
Bruce St & Wellington St	Signalized	B (17)		
Bruce St & Ainslie St	Signalized	A (9)		

During morning peak hour, all the intersections are expected to operate at an overall LOS 'D' or better, except for the Highway 401 eastbound off-ramp terminal at King Street. This intersection is expected to operate at an overall LOS E with 67 seconds of average delay. This presents the need for additional network capacity for the eastbound off-ramp demand – where the eastbound left turn vehicles (approximately 470 vehicles per hour) is assumed to operate with a single lane.

For those study area intersections with center-running LRT, left-turn movements from a major to a minor street is assumed to operate under a 'protected-phase' only (e.g. the northbound and southbound left turns along Hespeler Road) – which will allow vehicles to make a 'U-turn' also. The dedicated left-turn phases not only increase vehicular delays for the left-turn movements, but also increase vehicular delays for all the movements. With the proposed LRT operations, many individual turning movements are expected to operate at LOS E/F during the future (2031) morning peak hour.

Higher amount of travel demand during the future afternoon peak hour than the morning peak hour is expected to result in higher vehicular delays for the study area intersections. During the future (2031) afternoon peak hour, many individual turning movements are also expected to operate with high delays at an unacceptable LOS (i.e. LOS E/F) as presented in Table 2. The following seven intersections are expected to operate at an overall LOS E/F during afternoon peak hour:

- King Street and Deer Ridge Drive
- King Street and Baxter Place/ Sportsworld Drive
- King Street and Hwy 401 WB Off-Ramp
- King Street and Hwy 401 EB Off-Ramp
- Hespeler Road and Bishop Street
- Hespeler Road and Dunbar Road
- Hespeler Road and Can-Amera Parkway

The intersection capacity analysis results for the King Street and Eagle Street intersection indicate that this intersection is expected to operate with an acceptable LOS C/D for the future peak hour conditions. However, the northbound queue length along King Street is expected to extend upstream beyond Dover Street during morning peak hour (with a 95th percentile queue length of approximate 100 m). In order to accommodate this queue length and provide an acceptable LOS, two through lanes in the northbound direction is very essential on King Street south of Dover Street intersection, and the existing 'on-street' parking would need to be prohibited specifically for the northbound direction during peak hours. In addition, potential signal coordination between vehicular and transit operations could also be explored/assessed in the detailed design stage by designing signal timings to improve the overall intersection performance for all modes. For example, the westbound through/left movements at the King Street and Eagle Street intersection could be operated simultaneously with the LRT operation.

The potential network solutions to reduce vehicular delays at the above-mentioned intersections are discussed in the following section.

6 Alternative Solutions to Improve Future Intersection Operation

The potential network solutions for the study area are presented below:

King Street and Deer Ridge Drive Intersection

This intersection is proposed to operate with center-running LRT in both directions while keep existing number of lanes approaching the intersection. The northbound and southbound left movements on King Street are assumed to operate under a protected-only phase.

High traffic demand is expected for the southbound through movement during future afternoon peak hour (over 2,200 vph for 2031 allocated to two lanes) and contributing to high overall intersection delays. To reduce vehicular delays, additional through/turning lanes would be required for the side street. With this improvements, additional green time could be assigned to the movements along major street (King Street). More detailed intersection configuration improvements need to be assessed in the detailed design study.

King Street and Baxter Place/ Sportsworld Drive Intersection

Similar to the King Street and Deer Ridge Drive intersection, King Street and Baxter Place/ Sportsworld Drive intersection is proposed to operate with center-running LRT in both directions while keep existing number of lanes approaching the intersection. The northbound and southbound left movements on King Street are assumed to operate under ‘protected-phase’ only.

The higher delays for this intersection are contributed due to the existing intersection geometry requirements where the eastbound and westbound approaches are required to operate under split phases. With the intersection geometry improvements, the signal timing could be re-designed allowing eastbound and westbound approaches to operate simultaneously. Therefore, the overall intersection operation would be more efficient and result in lower vehicular delays.

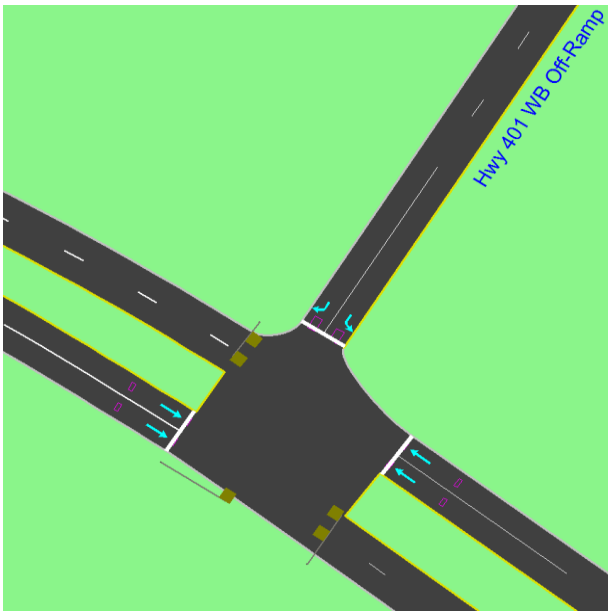
Highway 401 Ramp Terminals at King Street

To mitigate traffic impacts at the Highway 401/King Street Interchange, three alternative improvement options could be considered (individually or combined):

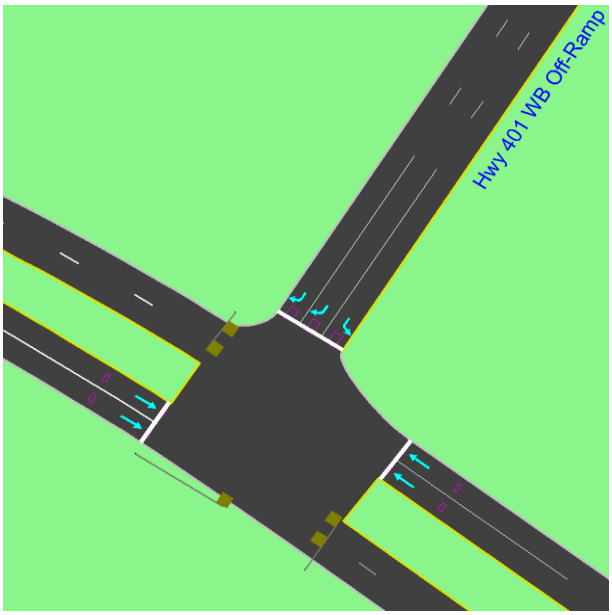
1. Provide additional turning lanes on Highway 401 off-ramps;
2. Provide an additional through lane for northbound and southbound directions along King Street (i.e. widening with three through lanes per direction) at the Highway 401 Interchange, and

3. Provide dual left-turn lanes for the southbound left movement at Highway 401 Eastbound Ramp Terminal.

To assess the benefits with Option 1, a sensitivity analysis was conducted in Synchro model assuming additional turning lanes on Highway 401 off-ramps. The intersection lane configurations (screenshot of Synchro models) considered for the future (2031) intersection capacity analysis and Sensitivity Analysis are presented in Figure 5 and Figure 6 for Highway 401 westbound and eastbound ramp terminals, respectively.

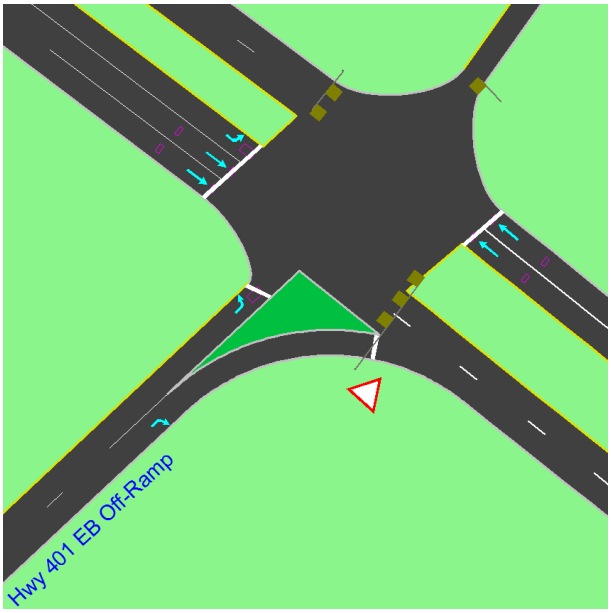


Highway 401 Interchange Configuration considered in Future Intersection Analysis as proposed in 'Preliminary Design, Detailed Design and Class Environmental Assessment (EA) Study for the improvements along Highway 401 from 1 km west of the Homer Watson interchange to 1.5 km east of the King Street interchange'

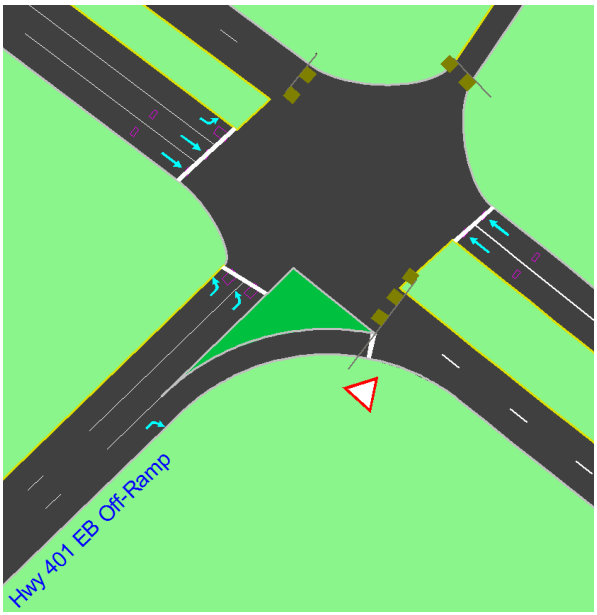


Highway 401 Interchange Configuration considered for Sensitivity Analysis, consider dual lanes for WB right turn movement

Figure 5: Alternative Intersection Lane Configurations for Highway 401 Westbound Off-Ramp



Highway 401 Interchange Configuration considered in Future Intersection Analysis as proposed in 'Preliminary Design, Detailed Design and Class Environmental Assessment (EA) Study for the improvements along Highway 401 from 1 km west of the Homer Watson interchange to 1.5 km east of the King Street interchange'



Highway 401 Interchange Configuration considered for Sensitivity Analysis, - dual lanes for EB left turn movement

Figure 6: Alternative Intersection Lane Configurations for Highway 401 Eastbound Off-Ramp

The Synchro analysis results for the Sensitivity Analysis confirm that with additional turning lanes, both Highway 401 ramp terminals are expected to operate with reduced vehicular delays and improved LOS for future peak hour conditions (as presented in Table 3 for 2031 condition).

With the additional improvements as suggested under Option 2 and 3 could reduce further delays at the Highway 401 ramp terminals. Additional traffic analysis is required to assess the potential benefits with these improvements.

Table 3: Future (2031) Sensitivity Analysis Results for Highway 401 Ramp Terminals

Intersection	Control Type	2031 AM Peak Hour		
		Overall LOS (Delay in s)	Critical Movements (v/c) LOS (Delay)	95th Percentile Queues (m)
King St & Hwy 401 WB Off-Ramp	Signalized	B (11)		
King St & Hwy 401 EB Off-Ramp	Signalized	D (41)	EB-L (0.81) E (57) SB-L (0.94) E (65)	82 191
Intersection	**Control Type**	**2031 PM Peak Hour**		
		Overall LOS (Delay in s)	**Critical Movements (v/c) LOS (Delay)**	**95th Percentile Queues (m)**
King St & Hwy 401 WB Off-Ramp	Signalized	C (22)		
King St & Hwy 401 EB Off-Ramp	Signalized	D (37)	SB-L (1.05) E (71)	212

Hespeler Road and Bishop Street

This intersection is proposed to operate with center-running LRT in both directions by converting the existing general-purpose lanes on Hespeler Road into the LRT corridor. The northbound and southbound left movements on Hespeler Road will required to operate only under ‘protected-phase’.

To reduce vehicular delays, additional through/turning lanes could be considered for the side street (Bishop Street). With this improvements, additional green time could be assigned to the movements along major street (Hespeler Road). More detailed intersection configuration improvements need to be assessed in the detailed design study.

Hespeler Road and Dunbar Road

Similar to the Hespeler Road and Bishop Street intersection, the Hespeler Road and Dunbar Road intersection is proposed to operate with center-running LRT in both directions by converting existing general-purpose lanes on Hespeler Road into the LRT corridor. The northbound and southbound left movements on Hespeler Road will required to operate only under ‘protected-phase’.

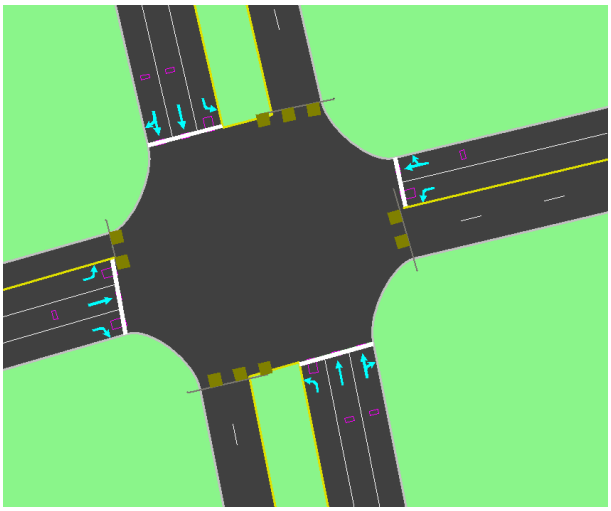
To reduce vehicular delays, additional through/turning lanes could be considered for the side street (Dunbar Road). More detailed intersection configuration improvements need to be assessed in the detailed design study.

Hespeler Road and Can-Amera Parkway

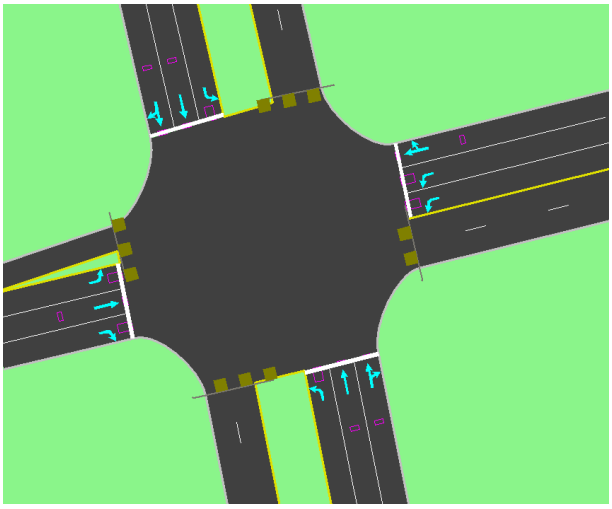
This intersection is proposed to operate with center-running LRT in both directions by converting the general-purpose lanes on Hespeler Road into the LRT corridor. The higher traffic volumes are expected for the westbound left movement (on Can-Amera Parkway) during future afternoon peak hour (approximately 600 vph for 2031 condition).

To reduce vehicular delays and improve future intersection operation, dual left turn lanes could be considered for the westbound left movement.

The intersection lane configurations (screenshot from Synchro model) considered for the future (2031) intersection capacity analysis and Sensitivity Analysis are presented in Figure 7.



Intersection Configuration Considered in Future Intersection Analysis



Intersection Configuration Considered in Sensitivity Analysis - dual lanes for WB left movement

Figure 7: Alternative Intersection Lane Configurations for Hespeler Road and Can-Amera Parkway

The Synchro analysis results for the Sensitivity Analysis confirm that with an additional westbound left turning lane, Hespeler Road and Can-Amera Parkway intersection is expected to operate with reduced vehicular delays and improved LOS for future peak hour conditions (as presented in Table 4 for 2031 condition).

Due to capacity constrain at this intersection, some movements are still expected to operate at LOS *F*. Further vehicular delay is expected to reduce over time with higher transit and active transportation modal shares.

Table 4: Future (2031) Sensitivity Analysis Results for Hespeler Road and Can-Amera Parkway

Intersection	Control Type	Overall LOS (Delay in s)	Critical Movements (v/c) LOS (Delay)	95th Percentile Queues (m)
Hespeler Road and Can-Amera Parkway	Signalized	**2031 AM Peak Hour**		
		C (24)	EB-L (0.26) E (68) EB-T (0.19) E (64) WB-L (0.99) F (109) NB-L (0.46) E (73) SB-L (0.48) F (93)	12 12 83 30 38
		2031 PM Peak Hour		
		F (99)	EB-L (0.50) E (75) EB-T (0.20) E (61) WB-L (1.43) F (248) NB-L (0.43) E (77) NB-TR (1.25) F (133) SB-L (0.46) E (73)	26 17 170 20 393 38

7 Conclusion

The traffic impact assessment was conducted for the future (2031) traffic conditions for 21 signalized intersections (including 17 existing signalized intersections and 4 intersections with proposed traffic signals) along the preferred route of Waterloo LRT between Kitchener and Cambridge.

The future (2031) peak hour vehicular traffic demands for the study area intersection were estimated based on the existing traffic pattern derived using the turning movement counts, and the vehicular link volumes for the study area intersections (i.e. approaching and leaving volumes at intersections) extracted from the existing (2011) and future (2031) travel demand models. The future turning movement counts were estimated using a 'bi-proportional balancing' methodology which considers both the total approaching and leaving traffic volumes. Future intersection capacity analysis was conducted using Synchro software for both peak hour conditions. The future intersections lane configurations with the LRT scenario were coded in the Synchro model with optimized signal timing plans.

With the proposed LRT, all the study area intersections are expected to operate with an overall acceptable LOS (i.e. LOS 'D' or better) except for the Highway 401 eastbound off-ramp terminal at King Street.

During afternoon peak hour, the following seven intersections are expected to operate at an overall LOS E/F:

- King Street & Deer Ridge Drive
- King Street & Baxter Place/ Sportsworld Drive
- King Street & Hwy 401 WB Off-Ramp
- King Street & Hwy 401 EB Off-Ramp
- Hespeler Road & Bishop Street
- Hespeler Road & Dunbar Road
- Hespeler Road & Can-Amera Parkway

To reduce vehicular delays and improve traffic conditions for these seven intersections, additional intersection capacity analyses were conducted with alternative network improvements such as provision of additional turning lanes, and/or through lanes with the optimization of traffic signal timing plans. The potential benefits with the suggested network solutions are presented in the Section 6.

The goals of the proposed LRT are to provide a greater transportation choice, move people, manage growth, and facilitate intensification and re-urbanization in urban areas. A high-quality rapid transit system is vital for the Region to evolve into a more compact urban form, helping to manage sprawl and protecting sensitive environmental landscapes and high-quality farmlands from urban encroachment. In general, the overall intersection capacity for vehicular traffic in the study area is expected to reduce with the required operational changes and the effects of traffic using modified access to adjacent

properties. With the proposed LRT, vehicular traffic demand is expected to reduce over time with higher transit and active transportation modal shares.

APPENDIX

A Future (2031) Peak Hour Traffic Volumes

2031 AM Peak Hour

1: King St & Deer Ridge Dr												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	340	12	161	8	3	11	116	1225	42	17	1719	285
2: King St & Sportsworld Crossing Rd												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	37	24	96	9	37	59	133	954	3	122	1469	41
3: King St & Baxter Pl/Sportsworld Dr												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	60	58	138	407	55	81	92	1024	176	108	1152	57
4: King St & Tu Ln St												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)				117		31		1226	13	32	1931	
5: King St & Hwy 401 WB Off-Ramp												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)				56		360		1356	0	0	911	
6: Hwy 401 EB Off-Ramp & King St												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	470	0	115	0	0	0	0	934	0	451	616	0
7: Shantz Hill Rd & Preston Pwky												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	287		77				58	466			340	147
8: King St & Eagle St												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	0	0	0	31	46	282	2	788	22	290	604	39
9: Hespeler Road and 605/611 Hespeler Road (Travelodge) Access												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	90	0	19	7	0	9	31	779	4	20	1354	130
10: Hespeler Road and 561 Hespeler Road (Party City) Access												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	41	2	25	51	5	58	28	837	28	71	1317	47
11: Hespeler Rd & Langs Dr/ Sheldon Dr												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	51	114	69	106	104	115	93	954	108	140	1136	87

2031 AM Peak Hour

12: Hespeler Road and 480 Hespeler Road (Value Village) Access												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	31	1	43	21	0	10	88	892	21	39	1156	44
13: Hespeler Rd & Bishop St												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	159	237	122	82	238	154	144	845	101	201	881	187
14: Hespeler Rd & Cambridge Centre												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	4	1	12	12	1	37	9	864	30	77	917	14
15: Hespeler Rd & Dunbar Rd												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	63	109	167	87	167	66	214	990	109	105	891	81
16: Hespeler Rd & Can Amera Pkwy												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	15	16	13	300	32	33	57	1313	279	63	868	25
17: Hespeler Rd & Isherwood Ave/Munch Ave												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	78	12	36	73	14	343	31	1153	37	65	948	189
18: Hespeler Rd & Jaffray St/Avenue Rd												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	5	1	12	182	6	78	14	1641	95	60	945	14
19: Wellington St & Main St												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	90	166	32	33	188	82	33	182	56	21	36	47
20: Bruce St & Wellington St												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	170	113	2	43	0	80	0	30	10	49	118	0
21: Bruce St & Ainslie St												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	0	60	0	0	0	0	0	508	82	56	538	60

2031 PM Peak Hour

1: King St & Deer Ridge Dr												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	310	2	75	26	32	24	114	1470	22	24	2247	327
2: King St & Sportsworld Crossing Rd												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	49	55	124	17	28	135	62	1229	10	115	1470	19
3: King St & Baxter Pl/Sportsworld Dr												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	46	56	107	393	42	62	145	1086	182	141	1328	60
4: King St & Tu Ln St												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)				541		55		1259	37	43	2080	
5: King St & Hwy 401 WB Off-Ramp												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)				117		604		1207	0	0	1718	
6: Hwy 401 EB Off-Ramp & King St												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	450	0	100	0	0	0	0	841	0	528	1225	0
7: Shantz Hill Rd & Preston Pwky												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	257		61				82	374			556	344
8: King St & Eagle St												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	0	0	0	38	34	330	6	697	39	259	612	46
9: Hespeler Road and 605/611 Hespeler Road (Travelodge) Access												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	139	4	51	5	0	21	90	1477	9	24	1125	128
10: Hespeler Road and 561 Hespeler Road (Party City) Access												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	67	4	32	65	3	102	61	1594	46	76	1355	46
11: Hespeler Rd & Langs Dr/ Sheldon Dr												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	88	228	129	124	355	296	122	1294	141	135	1148	94

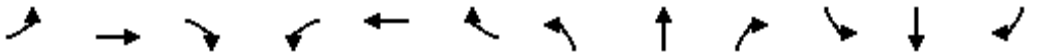
2031 PM Peak Hour

12: Hespeler Road and 480 Hespeler Road (Value Village) Access												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	86	5	125	43	9	16	108	1470	35	30	1175	33
13: Hespeler Rd & Bishop St												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	190	353	223	126	380	204	202	1190	89	202	1137	174
14: Hespeler Rd & Cambridge Centre												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	15	1	11	34	5	72	10	1118	62	101	1178	8
15: Hespeler Rd & Dunbar Rd												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	82	217	297	223	248	128	207	1186	128	160	1278	89
16: Hespeler Rd & Can Amera Pkwy												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	44	26	40	591	37	52	50	1547	319	105	1616	32
17: Hespeler Rd & Isherwood Ave/Munch Ave												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	91	84	41	39	13	395	12	1426	83	417	1482	166
18: Hespeler Rd & Jaffray St/Avenue Rd												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	11	6	10	158	5	99	9	1497	149	82	1817	11
19: Wellington St & Main St												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	96	143	48	71	207	62	69	127	61	63	146	146
20: Bruce St & Wellington St												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	171	78	3	46	0	114	0	10	1	66	240	0
21: Bruce St & Ainslie St												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	0	60	0	0	0	0	0	567	104	28	526	60

APPENDIX

B Future (2031) Synchro Reports

1: King St & Deer Ridge Dr



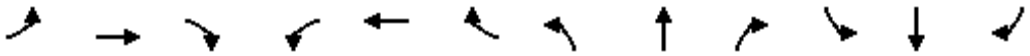
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	340	12	161	8	3	11	116	1225	42	17	1719	285
Confl. Peds. (#/hr)			5	5					1	1		
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	3%	0%	0%	0%	2%	0%	0%	2%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	378	192	0	9	15	0	129	1408	0	19	1910	317
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								6
Detector Phase	4	4		8	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		5.0	20.0		5.0	20.0	20.0
Minimum Split (s)	34.1	34.1		34.1	34.1		10.0	33.5		10.0	33.5	33.5
Total Split (s)	43.0	43.0		43.0	43.0		15.0	87.0		10.0	82.0	82.0
Total Split (%)	30.7%	30.7%		30.7%	30.7%		10.7%	62.1%		7.1%	58.6%	58.6%
Yellow Time (s)	3.3	3.3		3.3	3.3		3.0	3.7		3.0	3.7	3.7
All-Red Time (s)	3.8	3.8		3.8	3.8		2.0	3.8		2.0	3.8	3.8
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)	7.1	7.1		7.1	7.1		5.0	7.5		5.0	7.5	7.5
Lead/Lag							Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	C-Max
Act Effct Green (s)	35.9	35.9		35.9	35.9		10.0	83.5		5.0	74.5	74.5
Actuated g/C Ratio	0.26	0.26		0.26	0.26		0.07	0.60		0.04	0.53	0.53
v/c Ratio	1.04	0.41		0.04	0.03		1.01	0.67		0.30	1.01	0.33
Control Delay	107.5	28.6		39.9	20.4		149.0	15.3		77.8	56.9	7.9
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	107.5	28.6		39.9	20.4		149.0	15.3		77.8	56.9	7.9
LOS	F	C		D	C		F	B		E	E	A
Approach Delay		80.9			27.7			26.5			50.2	
Approach LOS		F			C			C			D	
Queue Length 50th (m)	~118.4	27.6		2.0	0.7		39.6	84.4		5.5	~298.0	18.1
Queue Length 95th (m)	#183.7	51.8		7.0	6.7		#84.9	65.2		14.8	#352.1	37.2
Internal Link Dist (m)		79.9			78.0			194.3			108.8	
Turn Bay Length (m)							60.0			45.0		
Base Capacity (vph)	364	467		254	437		128	2101		64	1883	948
Starvation Cap Reductn	0	0		0	0		0	12		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	1.04	0.41		0.04	0.03		1.01	0.67		0.30	1.01	0.33

Intersection Summary
Cycle Length: 140

Actuated Cycle Length: 140	
Offset: 85 (61%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 150	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.04	
Intersection Signal Delay: 45.8	Intersection LOS: D
Intersection Capacity Utilization 95.8%	ICU Level of Service F
Analysis Period (min) 15	

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

Splits and Phases: 1: King St & Deer Ridge Dr

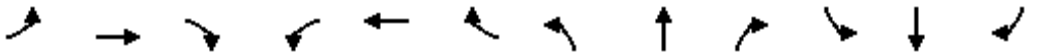


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	37	24	96	9	37	59	133	954	3	122	1469	41
Confl. Peds. (#/hr)	11		3	3		11			1	1		
Confl. Bikes (#/hr)												
Peak Hour Factor	0.71	0.71	0.71	0.82	0.82	0.82	0.91	0.91	0.91	0.89	0.89	0.89
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	0%	2%	0%	0%	7%	1%	6%	0%	1%	3%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	52	169	0	11	117	0	146	1051	0	137	1697	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Detector Phase	4	4		8	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	27.0	27.0		27.0	27.0		10.0	22.0		10.0	22.0	
Total Split (s)	27.0	27.0		27.0	27.0		25.0	89.0		24.0	88.0	
Total Split (%)	19.3%	19.3%		19.3%	19.3%		17.9%	63.6%		17.1%	62.9%	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	4.0		3.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		5.0	6.0		5.0	6.0	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		None	C-Max		Max	C-Max	
Act Effct Green (s)	12.8	12.8		12.8	12.8		16.6	83.0		27.2	93.6	
Actuated g/C Ratio	0.09	0.09		0.09	0.09		0.12	0.59		0.19	0.67	
v/c Ratio	0.60	0.66		0.20	0.61		0.69	0.52		0.39	0.73	
Control Delay	87.2	32.2		66.1	49.2		42.9	33.9		68.1	2.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.3	
Total Delay	87.2	32.2		66.1	49.2		42.9	33.9		68.1	3.0	
LOS	F	C		E	D		D	C		E	A	
Approach Delay		45.2			50.6			35.0			7.8	
Approach LOS		D			D			C			A	
Queue Length 50th (m)	14.9	13.7		3.1	19.6		37.5	115.7		42.4	17.5	
Queue Length 95th (m)	22.6	20.9		8.8	34.5		m52.4	161.4		m43.9	m20.0	
Internal Link Dist (m)		46.0			33.8			137.9			194.3	
Turn Bay Length (m)							60.0			80.0		
Base Capacity (vph)	144	345		88	283		262	2019		347	2335	
Starvation Cap Reductn	0	0		0	0		0	0		0	176	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.36	0.49		0.13	0.41		0.56	0.52		0.39	0.79	

Intersection Summary
Cycle Length: 140

Actuated Cycle Length: 140
Offset: 91 (65%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.73
Intersection Signal Delay: 21.5 Intersection LOS: C
Intersection Capacity Utilization 74.6% ICU Level of Service D
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: King St & Sportsworld Crossing Rd

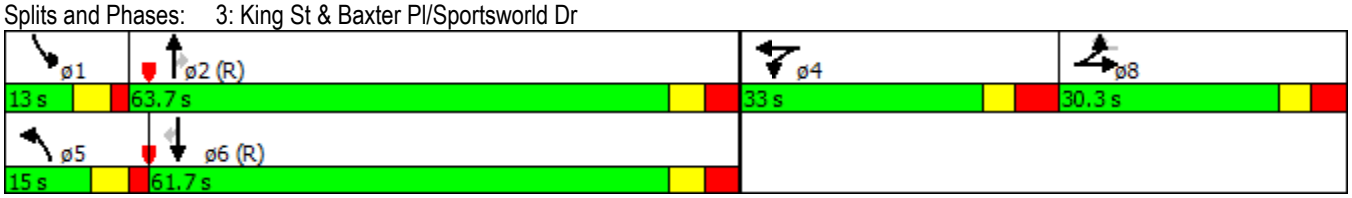


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	58	138	407	55	81	92	1024	176	108	1152	57
Confl. Peds. (#/hr)	2					2	1					1
Confl. Bikes (#/hr)												
Peak Hour Factor	0.73	0.73	0.73	0.91	0.91	0.91	0.93	0.93	0.93	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	7%	5%	0%	16%	0%	9%	14%	5%	9%	3%	4%	30%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)				44%								
Lane Group Flow (vph)	82	268	0	250	257	89	99	1101	189	117	1252	62
Turn Type	Split	NA		Split	NA	custom	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	8	8		4	4		5	2		1	6	
Permitted Phases						8			2			6
Detector Phase	8	8		4	4	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	8.0	8.0		10.0	10.0	8.0	6.0	20.0	20.0	7.0	20.0	20.0
Minimum Split (s)	30.3	30.3		30.8	30.8	30.3	12.0	27.5	27.5	13.0	27.5	27.5
Total Split (s)	30.3	30.3		33.0	33.0	30.3	15.0	63.7	63.7	13.0	61.7	61.7
Total Split (%)	21.6%	21.6%		23.6%	23.6%	21.6%	10.7%	45.5%	45.5%	9.3%	44.1%	44.1%
Yellow Time (s)	3.3	3.3		3.3	3.3	3.3	4.0	3.7	3.7	4.0	3.7	3.7
All-Red Time (s)	4.0	4.0		4.5	4.5	4.0	2.0	3.8	3.8	2.0	3.8	3.8
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.3	7.3		7.8	7.8	7.3	6.0	7.5	7.5	6.0	7.5	7.5
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None		None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	12.6	12.6		24.9	24.9	12.6	15.5	63.6	63.6	10.2	58.4	58.4
Actuated g/C Ratio	0.09	0.09		0.18	0.18	0.09	0.11	0.45	0.45	0.07	0.42	0.42
v/c Ratio	0.54	0.70		0.95	0.93	0.34	0.57	0.70	0.25	0.47	0.87	0.10
Control Delay	73.3	46.1		100.9	96.4	4.4	72.8	29.6	7.9	85.3	20.3	0.5
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	73.3	46.1		100.9	96.4	4.4	72.8	29.6	7.9	85.3	20.3	0.5
LOS	E	D		F	F	A	E	C	A	F	C	A
Approach Delay		52.4			84.5			29.7			24.8	
Approach LOS		D			F			C			C	
Queue Length 50th (m)	23.3	24.0		76.6	78.4	0.0	29.3	89.8	5.9	17.4	130.7	0.0
Queue Length 95th (m)	32.0	27.4		#134.3	#135.3	2.1	50.4	110.0	21.9	m22.3	#226.1	m0.2
Internal Link Dist (m)		25.1			83.4			489.7			202.0	
Turn Bay Length (m)							50.0		50.0	110.0		55.0
Base Capacity (vph)	277	612		266	278	359	175	1562	750	248	1446	592
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.44		0.94	0.92	0.25	0.57	0.70	0.25	0.47	0.87	0.10

Intersection Summary
Cycle Length: 140

Actuated Cycle Length: 140
Offset: 4 (3%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 125
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.95
Intersection Signal Delay: 38.6 Intersection LOS: D
Intersection Capacity Utilization 80.5% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: King St & Baxter Pl/Sportsworld Dr



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	117	31	1226	13	32	1931
Confl. Peds. (#/hr)		1		1	1	
Confl. Bikes (#/hr)						
Peak Hour Factor	0.80	0.80	0.98	0.98	0.91	0.91
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	9%	0%	5%	5%	0%	6%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	185	0	1264	0	35	2122
Turn Type	Prot		NA		Prot	NA
Protected Phases	8		2		1	6
Permitted Phases						
Detector Phase	8		2		1	6
Switch Phase						
Minimum Initial (s)	10.0		25.0		5.0	25.0
Minimum Split (s)	33.0		31.0		10.0	31.0
Total Split (s)	33.0		96.0		11.0	107.0
Total Split (%)	23.6%		68.6%		7.9%	76.4%
Yellow Time (s)	4.0		4.0		3.0	4.0
All-Red Time (s)	2.0		2.0		2.0	2.0
Lost Time Adjust (s)	0.0		0.0		0.0	0.0
Total Lost Time (s)	6.0		6.0		5.0	6.0
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?						
Recall Mode	None		C-Max		None	C-Max
Act Effct Green (s)	12.8		104.1		8.2	115.2
Actuated g/C Ratio	0.09		0.74		0.06	0.82
v/c Ratio	0.59		0.50		0.34	0.76
Control Delay	61.5		8.9		56.2	10.2
Queue Delay	0.0		0.0		0.0	0.0
Total Delay	61.5		8.9		56.2	10.2
LOS	E		A		E	B
Approach Delay	61.5		8.9			10.9
Approach LOS	E		A			B
Queue Length 50th (m)	23.9		73.9		9.4	93.3
Queue Length 95th (m)	31.2		106.8		m13.1	150.5
Internal Link Dist (m)	81.1		69.3			489.7
Turn Bay Length (m)					50.0	
Base Capacity (vph)	632		2551		106	2802
Starvation Cap Reductn	0		0		0	0
Spillback Cap Reductn	0		0		0	0
Storage Cap Reductn	0		0		0	0
Reduced v/c Ratio	0.29		0.50		0.33	0.76

Intersection Summary
Cycle Length: 140

Actuated Cycle Length: 140
Offset: 137 (98%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.76
Intersection Signal Delay: 12.8 Intersection LOS: B
Intersection Capacity Utilization 72.1% ICU Level of Service C
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: King St & Tu Ln St

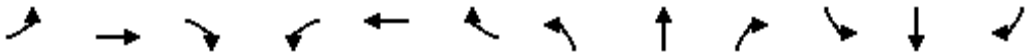
5: King St & Hwy 401 WB Off-Ramp

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	56	360	1356	0	0	911
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	4%	0%	0%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	62	400	1507	0	0	1012
Turn Type	Prot	Perm	NA			NA
Protected Phases	8		2			6
Permitted Phases		8				
Detector Phase	8	8	2			6
Switch Phase						
Minimum Initial (s)	10.0	10.0	20.0			20.0
Minimum Split (s)	30.0	30.0	30.0			27.0
Total Split (s)	48.0	48.0	72.0			72.0
Total Split (%)	40.0%	40.0%	60.0%			60.0%
Yellow Time (s)	4.0	4.0	4.0			4.0
All-Red Time (s)	3.0	3.0	3.0			3.0
Lost Time Adjust (s)	0.0	0.0	0.0			0.0
Total Lost Time (s)	7.0	7.0	7.0			7.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	Max			Max
Act Effct Green (s)	30.7	30.7	65.3			65.3
Actuated g/C Ratio	0.28	0.28	0.59			0.59
v/c Ratio	0.13	0.87	0.73			0.48
Control Delay	29.1	55.0	20.1			14.6
Queue Delay	0.0	0.0	0.0			0.0
Total Delay	29.1	55.0	20.1			14.6
LOS	C	E	C			B
Approach Delay	51.5		20.1			14.6
Approach LOS	D		C			B
Queue Length 50th (m)	10.4	81.0	122.5			64.9
Queue Length 95th (m)	20.9	119.9	184.7			99.6
Internal Link Dist (m)	84.8		273.9			107.6
Turn Bay Length (m)						
Base Capacity (vph)	662	608	2059			2120
Starvation Cap Reductn	0	0	0			0
Spillback Cap Reductn	0	0	0			0
Storage Cap Reductn	0	0	0			0
Reduced v/c Ratio	0.09	0.66	0.73			0.48

Intersection Summary
Cycle Length: 120

Actuated Cycle Length: 110.1	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.87	
Intersection Signal Delay: 23.1	Intersection LOS: C
Intersection Capacity Utilization 92.7%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 5: King St & Hwy 401 WB Off-Ramp



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	470	0	115	0	0	0	0	934	0	451	616	0
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	0%	2%	0%	0%	0%	0%	3%	0%	3%	4%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	522	0	128	0	0	0	0	1038	0	501	684	0
Turn Type	Prot		Perm					NA		Prot	NA	
Protected Phases	4							2		1	6	
Permitted Phases			4									
Detector Phase	4		4					2		1	6	
Switch Phase												
Minimum Initial (s)	10.0		10.0					20.0		5.0	20.0	
Minimum Split (s)	32.0		32.0					27.0		10.0	32.0	
Total Split (s)	41.0		41.0					41.0		38.0	79.0	
Total Split (%)	34.2%		34.2%					34.2%		31.7%	65.8%	
Yellow Time (s)	4.0		4.0					4.0		3.0	4.0	
All-Red Time (s)	3.0		3.0					3.0		2.0	3.0	
Lost Time Adjust (s)	0.0		0.0					0.0		0.0	0.0	
Total Lost Time (s)	7.0		7.0					7.0		5.0	7.0	
Lead/Lag								Lag		Lead		
Lead-Lag Optimize?												
Recall Mode	None		None					Max		None	Max	
Act Effct Green (s)	34.0		34.0					34.0		33.0	72.0	
Actuated g/C Ratio	0.28		0.28					0.28		0.28	0.60	
v/c Ratio	1.04		0.24					1.05		1.04	0.33	
Control Delay	93.8		9.0					83.1		95.0	12.5	
Queue Delay	0.0		0.0					0.0		0.0	0.0	
Total Delay	93.8		9.0					83.1		95.0	12.5	
LOS	F		A					F		F	B	
Approach Delay								83.1			47.4	
Approach LOS								F			D	
Queue Length 50th (m)	~139.9		2.7					~147.0		~134.2	41.8	
Queue Length 95th (m)	#208.5		17.8					#189.6		#202.3	53.4	
Internal Link Dist (m)		74.1			49.5			213.0			273.9	
Turn Bay Length (m)										185.0		
Base Capacity (vph)	501		529					993		481	2082	
Starvation Cap Reductn	0		0					0		0	0	
Spillback Cap Reductn	0		0					0		0	0	
Storage Cap Reductn	0		0					0		0	0	
Reduced v/c Ratio	1.04		0.24					1.05		1.04	0.33	

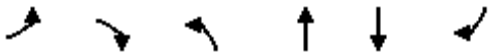
Intersection Summary
Cycle Length: 120

Actuated Cycle Length: 120	
Natural Cycle: 140	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.05	
Intersection Signal Delay: 67.0	Intersection LOS: E
Intersection Capacity Utilization 92.7%	ICU Level of Service F
Analysis Period (min) 15	

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Splits and Phases: 6: Hwy 401 EB Off-Ramp & King St

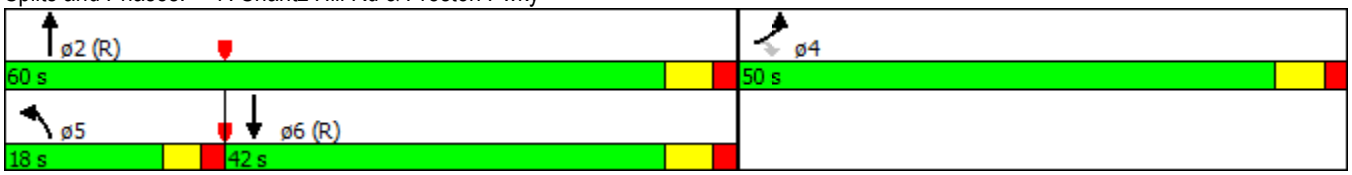


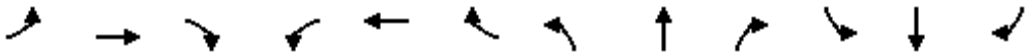
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	287	77	58	466	340	147
Confl. Peds. (#/hr)	2		1			1
Confl. Bikes (#/hr)						
Peak Hour Factor	0.81	0.81	0.93	0.93	0.84	0.84
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	6%	10%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	354	95	62	501	580	0
Turn Type	Prot	Perm	Prot	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases		4				
Detector Phase	4	4	5	2	6	
Switch Phase						
Minimum Initial (s)	7.0	7.0	5.0	5.0	5.0	
Minimum Split (s)	36.0	36.0	10.0	29.0	29.0	
Total Split (s)	50.0	50.0	18.0	60.0	42.0	
Total Split (%)	45.5%	45.5%	16.4%	54.5%	38.2%	
Yellow Time (s)	4.0	4.0	3.0	4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	5.0	6.0	6.0	
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?						
Recall Mode	None	None	None	C-Max	C-Max	
Act Effct Green (s)	28.1	28.1	9.5	69.9	57.6	
Actuated g/C Ratio	0.26	0.26	0.09	0.64	0.52	
v/c Ratio	0.79	0.21	0.44	0.23	0.33	
Control Delay	50.8	6.6	56.5	9.7	16.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	50.8	6.6	56.5	9.7	16.2	
LOS	D	A	E	A	B	
Approach Delay	41.4			14.9	16.2	
Approach LOS	D			B	B	
Queue Length 50th (m)	74.8	0.0	13.5	23.4	35.1	
Queue Length 95th (m)	85.2	8.7	26.6	39.4	54.7	
Internal Link Dist (m)	60.5			156.7	213.0	
Turn Bay Length (m)	25.0		30.0			
Base Capacity (vph)	700	666	194	2185	1737	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.51	0.14	0.32	0.23	0.33	

Intersection Summary
Cycle Length: 110

Actuated Cycle Length: 110	
Offset: 100 (91%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.79	
Intersection Signal Delay: 22.9	Intersection LOS: C
Intersection Capacity Utilization 53.4%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 7: Shantz Hill Rd & Preston Pwky





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	31	46	282	2	788	22	290	604	39
Confl. Peds. (#/hr)				3		5	2		4	4		2
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.91	0.91	0.91	0.91	0.91	0.91	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	11%	4%	7%	0%	4%	11%	5%	6%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	85	310	2	866	24	322	671	43
Turn Type				Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases					8		5	2		1	6	
Permitted Phases				8		8	2		2	6		6
Detector Phase				8	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)				8.0	8.0	8.0	5.0	10.0	10.0	4.0	10.0	10.0
Minimum Split (s)				30.0	30.0	30.0	9.0	25.0	25.0	8.0	25.0	25.0
Total Split (s)				30.0	30.0	30.0	9.0	33.5	33.5	19.0	43.5	43.5
Total Split (%)				33.3%	33.3%	33.3%	10.0%	37.2%	37.2%	21.1%	48.3%	48.3%
Yellow Time (s)				4.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)				2.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)					0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)					6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?								Yes	Yes	Yes		
Recall Mode				None	None	None	Max	C-Max	C-Max	None	Max	Max
Act Effct Green (s)					16.1	16.1	35.0	28.0	28.0	48.5	37.5	37.5
Actuated g/C Ratio					0.18	0.18	0.39	0.31	0.31	0.54	0.42	0.42
v/c Ratio					0.27	0.68	0.01	0.80	0.04	0.88	0.90	0.06
Control Delay					32.9	41.7	11.0	35.5	0.1	45.1	41.9	0.2
Queue Delay					0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay					32.9	41.7	11.0	35.5	0.1	45.1	41.9	0.2
LOS					C	D	B	D	A	D	D	A
Approach Delay					39.8			34.4			41.2	
Approach LOS					D			C			D	
Queue Length 50th (m)					13.5	30.2	0.2	76.2	0.0	38.7	110.9	0.0
Queue Length 95th (m)					25.2	42.7	1.2	100.1	0.0	#86.0	#180.8	0.0
Internal Link Dist (m)		85.2			196.5			54.2			93.0	
Turn Bay Length (m)							25.0		30.0			35.0
Base Capacity (vph)					464	685	214	1081	583	376	746	750
Starvation Cap Reductn					0	0	0	0	0	0	0	0
Spillback Cap Reductn					0	0	0	0	0	0	0	0
Storage Cap Reductn					0	0	0	0	0	0	0	0
Reduced v/c Ratio					0.18	0.45	0.01	0.80	0.04	0.86	0.90	0.06

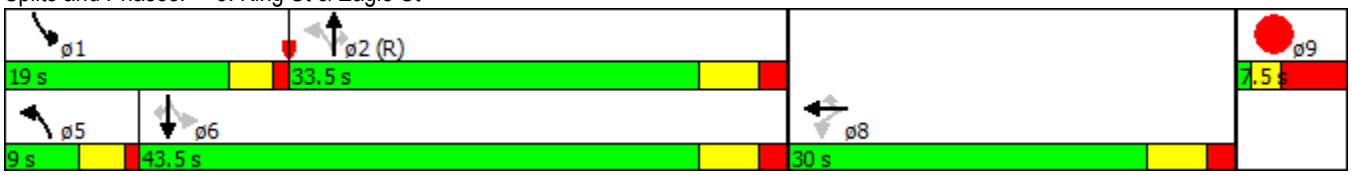
Intersection Summary
Cycle Length: 90

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Growth Factor	
Heavy Vehicles (%)	
Bus Blockages (#/hr)	
Parking (#/hr)	
Mid-Block Traffic (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	7.5
Total Split (s)	7.5
Total Split (%)	8%
Yellow Time (s)	2.0
All-Red Time (s)	4.5
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	Max
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (m)	
Queue Length 95th (m)	
Internal Link Dist (m)	
Turn Bay Length (m)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

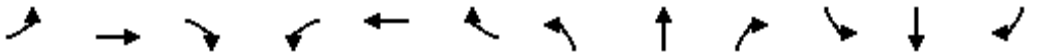
Intersection Summary

Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.90
Intersection Signal Delay: 38.4 Intersection LOS: D
Intersection Capacity Utilization 59.3% ICU Level of Service B
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 8: King St & Eagle St



9: Hespeler Rd & Travelodge Access



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	90	0	19	7	0	9	31	779	4	20	1354	130
Confl. Peds. (#/hr)	3					3	1		2	2		1
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	0%	1%	0%	0%	0%	0%	4%	0%	0%	5%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	100	21	0	8	10	0	34	870	0	22	1648	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Detector Phase	4	4		8	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		7.0	10.0		7.0	10.0	
Minimum Split (s)	35.0	35.0		35.0	35.0		12.0	25.0		12.0	25.0	
Total Split (s)	35.0	35.0		35.0	35.0		12.0	81.0		12.0	81.0	
Total Split (%)	25.0%	25.0%		25.0%	25.0%		8.6%	57.9%		8.6%	57.9%	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	4.0		3.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		5.0	6.0		5.0	6.0	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Act Effct Green (s)	15.4	15.4		15.4	15.4		7.0	79.8		7.0	79.8	
Actuated g/C Ratio	0.11	0.11		0.11	0.11		0.05	0.57		0.05	0.57	
v/c Ratio	0.65	0.07		0.05	0.03		0.38	0.44		0.24	0.85	
Control Delay	78.6	0.4		53.1	0.1		77.2	16.2		70.8	31.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.1		0.0	0.0	
Total Delay	78.6	0.4		53.1	0.1		77.2	16.4		70.8	31.2	
LOS	E	A		D	A		E	B		E	C	
Approach Delay		65.1			23.7			18.6			31.8	
Approach LOS		E			C			B			C	
Queue Length 50th (m)	28.4	0.0		2.1	0.0		10.6	34.8		6.3	219.3	
Queue Length 95th (m)	46.7	0.0		7.4	0.0		23.1	78.5		16.0	258.7	
Internal Link Dist (m)		38.8			40.1			172.4			59.0	
Turn Bay Length (m)							30.0					
Base Capacity (vph)	288	448		292	504		90	1976		90	1941	
Starvation Cap Reductn	0	0		0	0		0	266		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.35	0.05		0.03	0.02		0.38	0.51		0.24	0.85	

Intersection Summary
Cycle Length: 140

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Growth Factor	
Heavy Vehicles (%)	
Bus Blockages (#/hr)	
Parking (#/hr)	
Mid-Block Traffic (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	12.0
Total Split (s)	12.0
Total Split (%)	9%
Yellow Time (s)	5.0
All-Red Time (s)	6.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	Max
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (m)	
Queue Length 95th (m)	
Internal Link Dist (m)	
Turn Bay Length (m)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

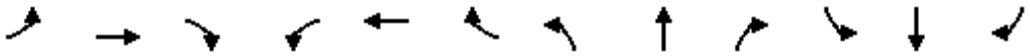
Intersection Summary

9: Hespeler Rd & Travelodge Access

Actuated Cycle Length: 140	
Offset: 119 (85%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.85	
Intersection Signal Delay: 28.8	Intersection LOS: C
Intersection Capacity Utilization 63.2%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 9: Hespeler Rd & Travelodge Access

10: Hespeler Rd & Party City Access

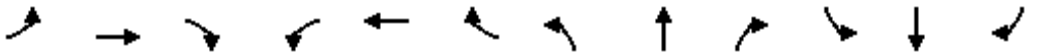


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	41	2	25	51	5	58	28	837	28	71	1317	47
Confl. Peds. (#/hr)	4		5	5		4	2		2	2		2
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	0%	0%	0%	0%	0%	2%	5%	0%	0%	5%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	46	30	0	57	70	0	31	961	0	79	1515	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Detector Phase	4	4		8	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		7.0	10.0		7.0	10.0	
Minimum Split (s)	33.0	33.0		33.0	33.0		12.0	25.0		12.0	25.0	
Total Split (s)	34.0	34.0		34.0	34.0		12.0	87.0		19.0	94.0	
Total Split (%)	24.3%	24.3%		24.3%	24.3%		8.6%	62.1%		13.6%	67.1%	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	4.0		3.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		5.0	6.0		5.0	6.0	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Act Effct Green (s)	11.5	11.5		11.5	11.5		8.3	100.1		11.4	108.1	
Actuated g/C Ratio	0.08	0.08		0.08	0.08		0.06	0.72		0.08	0.77	
v/c Ratio	0.43	0.19		0.50	0.37		0.30	0.39		0.54	0.57	
Control Delay	72.6	23.5		75.8	20.9		73.6	3.2		88.5	0.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.1		0.0	0.2	
Total Delay	72.6	23.5		75.8	20.9		73.6	3.3		88.5	1.0	
LOS	E	C		E	C		E	A		F	A	
Approach Delay		53.2			45.5			5.5			5.3	
Approach LOS		D			D			A			A	
Queue Length 50th (m)	13.0	0.6		16.2	1.7		9.4	12.2		24.3	3.2	
Queue Length 95th (m)	26.3	10.8		30.7	16.9		m16.5	20.2		m29.7	4.4	
Internal Link Dist (m)		13.6			13.3			147.8			172.4	
Turn Bay Length (m)							30.0			30.0		
Base Capacity (vph)	260	343		278	373		104	2448		185	2643	
Starvation Cap Reductn	0	0		0	0		0	453		0	387	
Spillback Cap Reductn	0	0		0	0		0	0		0	6	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.18	0.09		0.21	0.19		0.30	0.48		0.43	0.67	

Intersection Summary
Cycle Length: 140

Actuated Cycle Length: 140
Offset: 136 (97%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.57
Intersection Signal Delay: 8.5 Intersection LOS: A
Intersection Capacity Utilization 69.0% ICU Level of Service C
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 10: Hespeler Rd & Party City Access



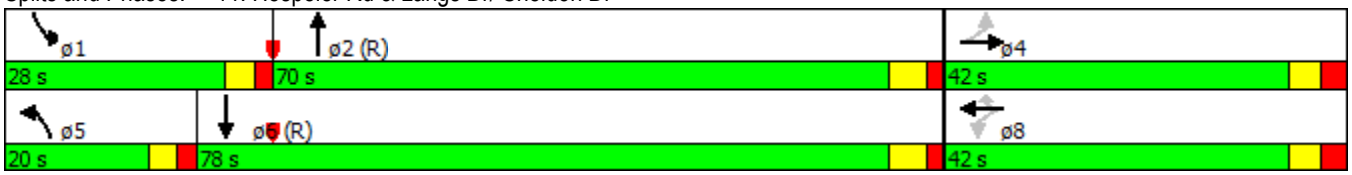
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	51	114	69	106	104	115	93	954	108	140	1136	87
Confl. Peds. (#/hr)	7		6	6		7	11		11	11		11
Confl. Bikes (#/hr)												
Peak Hour Factor	0.89	0.89	0.89	0.90	0.90	0.90	0.95	0.95	0.95	0.91	0.91	0.91
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	12%	5%	10%	12%	12%	16%	5%	8%	4%	16%	8%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	57	206	0	118	116	128	98	1118	0	154	1344	0
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Detector Phase	4	4		8	8	8	5	2		1	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0	8.0	7.0	10.0		7.0	10.0	
Minimum Split (s)	38.3	38.3		38.3	38.3	38.3	12.0	30.0		12.0	30.0	
Total Split (s)	42.0	42.0		42.0	42.0	42.0	20.0	70.0		28.0	78.0	
Total Split (%)	30.0%	30.0%		30.0%	30.0%	30.0%	14.3%	50.0%		20.0%	55.7%	
Yellow Time (s)	3.3	3.3		3.3	3.3	3.3	3.0	4.0		3.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0	3.0	2.0	2.0		2.0	2.0	
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)	6.3	6.3		6.3	6.3	6.3	5.0	6.0		5.0	6.0	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Recall Mode	None	None		None	None	None	None	C-Max		None	C-Max	
Act Effct Green (s)	24.7	24.7		24.7	24.7	24.7	12.6	79.6		18.4	85.4	
Actuated g/C Ratio	0.18	0.18		0.18	0.18	0.18	0.09	0.57		0.13	0.61	
v/c Ratio	0.30	0.66		0.98	0.39	0.37	0.64	0.60		0.75	0.67	
Control Delay	51.4	57.4		130.3	52.7	9.9	80.5	11.9		93.4	9.4	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.2	
Total Delay	51.4	57.4		130.3	52.7	9.9	80.5	11.9		93.4	9.6	
LOS	D	E		F	D	A	F	B		F	A	
Approach Delay		56.1			62.9			17.4			18.2	
Approach LOS		E			E			B			B	
Queue Length 50th (m)	14.6	51.0		34.5	30.2	0.0	24.2	74.7		48.0	28.6	
Queue Length 95th (m)	26.0	70.8		#60.3	45.4	16.6	50.2	60.8		70.9	54.1	
Internal Link Dist (m)		203.6			142.8			428.9			147.8	
Turn Bay Length (m)	115.0			70.0		70.0	40.0			30.0		
Base Capacity (vph)	273	439		176	432	442	185	1874		255	2017	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	122	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.21	0.47		0.67	0.27	0.29	0.53	0.60		0.60	0.71	

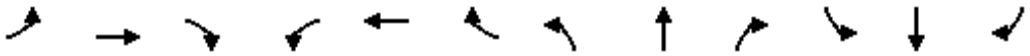
Intersection Summary
Cycle Length: 140

Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 95	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.98	
Intersection Signal Delay: 25.7	Intersection LOS: C
Intersection Capacity Utilization 79.8%	ICU Level of Service D
Analysis Period (min) 15	

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

Splits and Phases: 11: Hespeler Rd & Langs Dr/ Sheldon Dr



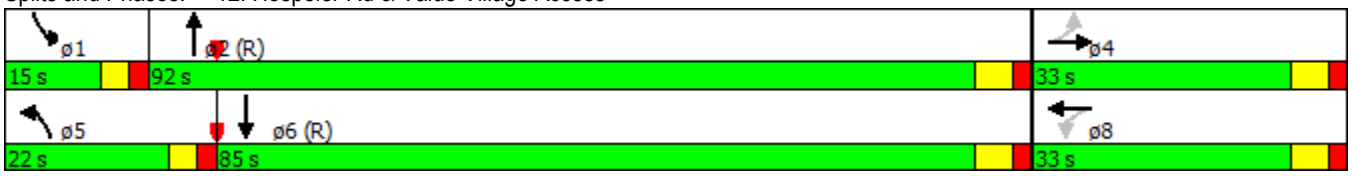


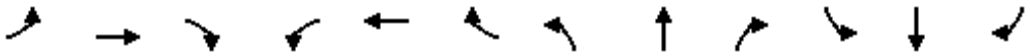
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	31	1	43	21	0	10	88	892	21	39	1156	44
Confl. Peds. (#/hr)	7		2	2		7	3		2	2		3
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	1%	3%	0%	0%	3%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	34	49	0	23	11	0	98	1014	0	43	1333	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Detector Phase	4	4		8	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		5.0	10.0		5.0	10.0	
Minimum Split (s)	33.0	33.0		33.0	33.0		11.0	25.0		11.0	25.0	
Total Split (s)	33.0	33.0		33.0	33.0		22.0	92.0		15.0	85.0	
Total Split (%)	23.6%	23.6%		23.6%	23.6%		15.7%	65.7%		10.7%	60.7%	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	4.0		3.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		5.0	6.0		5.0	6.0	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Act Effct Green (s)	9.5	9.5		9.5	9.5		13.0	110.9		8.7	103.3	
Actuated g/C Ratio	0.07	0.07		0.07	0.07		0.09	0.79		0.06	0.74	
v/c Ratio	0.36	0.32		0.25	0.03		0.59	0.37		0.38	0.52	
Control Delay	72.2	22.2		67.6	0.2		53.8	12.8		67.1	3.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	72.2	22.2		67.6	0.2		53.8	12.8		67.1	3.9	
LOS	E	C		E	A		D	B		E	A	
Approach Delay		42.6			45.8			16.4			5.9	
Approach LOS		D			D			B			A	
Queue Length 50th (m)	9.7	0.3		6.5	0.0		26.0	71.2		12.7	29.0	
Queue Length 95th (m)	21.4	13.4		16.1	0.0		m36.5	137.0		m19.6	32.3	
Internal Link Dist (m)		34.5			40.9			319.4			428.9	
Turn Bay Length (m)							50.0			40.0		
Base Capacity (vph)	271	346		264	494		218	2767		133	2570	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.13	0.14		0.09	0.02		0.45	0.37		0.32	0.52	

Intersection Summary
Cycle Length: 140

Actuated Cycle Length: 140
Offset: 13 (9%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.59
Intersection Signal Delay: 12.1 Intersection LOS: B
Intersection Capacity Utilization 63.3% ICU Level of Service B
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 12: Hespeler Rd & Value Village Access



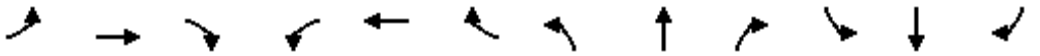


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	159	237	122	82	238	154	144	845	101	201	881	187
Confl. Peds. (#/hr)	16		5	5		16	12		13	13		12
Confl. Bikes (#/hr)												
Peak Hour Factor	0.87	0.87	0.87	0.94	0.94	0.94	0.95	0.95	0.95	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	9%	9%	14%	7%	12%	12%	8%	8%	6%	9%	9%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	183	272	140	87	253	164	152	995	0	223	1187	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8						
Detector Phase	7	4	4	3	8	8	5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	8.0	8.0	5.0	8.0	8.0	7.0	10.0		7.0	10.0	
Minimum Split (s)	9.0	40.0	40.0	9.0	40.0	40.0	12.0	30.0		12.0	30.0	
Total Split (s)	13.0	43.0	43.0	10.0	40.0	40.0	22.0	59.0		28.0	65.0	
Total Split (%)	9.3%	30.7%	30.7%	7.1%	28.6%	28.6%	15.7%	42.1%		20.0%	46.4%	
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0		3.0	4.0	
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	5.0	6.0		5.0	6.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	None	C-Max		None	C-Max	
Act Effct Green (s)	39.2	28.2	28.2	33.2	25.2	25.2	17.6	62.2		22.6	67.3	
Actuated g/C Ratio	0.28	0.20	0.20	0.24	0.18	0.18	0.13	0.44		0.16	0.48	
v/c Ratio	0.86	0.78	0.35	0.49	0.79	0.46	0.75	0.68		0.81	0.77	
Control Delay	76.3	67.7	8.8	47.6	72.3	16.1	78.7	35.9		87.6	19.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	76.3	67.7	8.8	47.6	72.3	16.1	78.7	35.9		87.6	19.1	
LOS	E	E	A	D	E	B	E	D		F	B	
Approach Delay		56.5			49.8			41.5			30.0	
Approach LOS		E			D			D			C	
Queue Length 50th (m)	42.7	75.8	0.0	19.2	71.3	7.9	46.5	81.8		68.8	96.7	
Queue Length 95th (m)	#64.5	97.8	15.5	31.5	96.8	28.3	#78.3	135.5		#99.1	182.3	
Internal Link Dist (m)		194.9			176.1			237.1			319.4	
Turn Bay Length (m)	50.0		100.0	60.0		40.0	55.0			65.0		
Base Capacity (vph)	212	460	487	176	431	439	214	1458		295	1546	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.86	0.59	0.29	0.49	0.59	0.37	0.71	0.68		0.76	0.77	

Intersection Summary
Cycle Length: 140

Actuated Cycle Length: 140
Offset: 60 (43%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 105
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.86
Intersection Signal Delay: 40.6 Intersection LOS: D
Intersection Capacity Utilization 83.9% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 13: Hespeler Rd & Bishop St



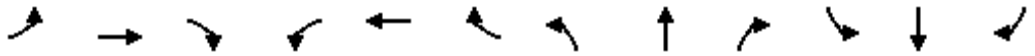
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	4	1	12	12	1	37	9	864	30	77	917	14
Confl. Peds. (#/hr)							2		1	1		2
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	0%	1%	0%	3%	0%	2%	3%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	4	14	0	13	42	0	10	993	0	86	1035	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Detector Phase	4	4		8	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		4.0	10.0		7.0	10.0	
Minimum Split (s)	36.0	36.0		36.0	36.0		9.0	30.0		12.0	30.0	
Total Split (s)	38.0	38.0		38.0	38.0		11.0	78.0		24.0	91.0	
Total Split (%)	27.1%	27.1%		27.1%	27.1%		7.9%	55.7%		17.1%	65.0%	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	4.0		3.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		5.0	6.0		5.0	6.0	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes				Yes	
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Act Effct Green (s)	8.2	8.2		8.2	8.2		6.4	105.4		12.1	121.2	
Actuated g/C Ratio	0.06	0.06		0.06	0.06		0.05	0.75		0.09	0.87	
v/c Ratio	0.05	0.13		0.16	0.32		0.12	0.38		0.56	0.34	
Control Delay	63.2	31.2		66.8	24.7		64.6	1.6		81.8	1.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.1		0.0	0.0	
Total Delay	63.2	31.2		66.8	24.7		64.6	1.6		81.8	1.0	
LOS	E	C		E	C		E	A		F	A	
Approach Delay		38.3			34.6			2.3			7.2	
Approach LOS		D			C			A			A	
Queue Length 50th (m)	1.1	0.3		3.7	0.3		3.0	12.1		26.3	4.2	
Queue Length 95th (m)	5.4	7.9		11.1	12.8		m5.4	15.9		m36.6	16.5	
Internal Link Dist (m)		16.7			46.1			170.1			237.1	
Turn Bay Length (m)							30.0			90.0		
Base Capacity (vph)	317	383		324	398		84	2628		240	3028	
Starvation Cap Reductn	0	0		0	0		0	435		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.01	0.04		0.04	0.11		0.12	0.45		0.36	0.34	

Intersection Summary
Cycle Length: 140

Actuated Cycle Length: 140	
Offset: 75 (54%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.56	
Intersection Signal Delay: 5.9	Intersection LOS: A
Intersection Capacity Utilization 52.2%	ICU Level of Service A
Analysis Period (min) 15	

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 14: Hespeler Rd & Cambridge Centre

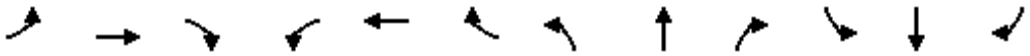


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	63	109	167	87	167	66	214	990	109	105	891	81
Confl. Peds. (#/hr)	14		2	2		14	2		3	3		2
Confl. Bikes (#/hr)												
Peak Hour Factor	0.88	0.88	0.88	0.91	0.91	0.91	0.91	0.91	0.91	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	9%	7%	8%	14%	4%	13%	6%	6%	14%	10%	8%	7%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	72	124	190	96	184	73	235	1208	0	111	1023	0
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8						
Detector Phase	4	4	4	3	8	8	5	2		1	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0	8.0	7.0	8.0	8.0	7.0	10.0		7.0	10.0	
Minimum Split (s)	39.0	39.0	39.0	13.0	39.0	39.0	14.0	31.0		12.0	31.0	
Total Split (s)	39.0	39.0	39.0	13.0	52.0	52.0	31.0	68.0		20.0	57.0	
Total Split (%)	27.9%	27.9%	27.9%	9.3%	37.1%	37.1%	22.1%	48.6%		14.3%	40.7%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.0	4.0		3.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	5.0	6.0		5.0	6.0	
Lead/Lag	Lag	Lag	Lag	Lead			Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	None	C-Max		None	C-Max	
Act Effct Green (s)	15.3	15.3	15.3	28.3	28.3	28.3	24.6	80.0		14.8	70.1	
Actuated g/C Ratio	0.11	0.11	0.11	0.20	0.20	0.20	0.18	0.57		0.11	0.50	
v/c Ratio	0.61	0.64	0.58	0.55	0.50	0.20	0.79	0.64		0.65	0.62	
Control Delay	79.1	74.1	14.4	58.8	53.8	4.4	56.8	31.0		85.7	12.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.2	
Total Delay	79.1	74.1	14.4	58.8	53.8	4.4	56.8	31.0		85.7	13.1	
LOS	E	E	B	E	D	A	E	C		F	B	
Approach Delay		45.7			44.9			35.2			20.2	
Approach LOS		D			D			D			C	
Queue Length 50th (m)	20.4	35.2	0.0	24.1	48.2	0.0	71.6	113.1		32.9	33.4	
Queue Length 95th (m)	35.6	53.5	20.8	39.4	69.2	6.6	m91.6	150.6		50.6	90.2	
Internal Link Dist (m)		140.3			115.8			240.5			170.1	
Turn Bay Length (m)	50.0		50.0	100.0		20.0	75.0			80.0		
Base Capacity (vph)	259	418	492	176	600	523	335	1901		192	1655	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	144	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.28	0.30	0.39	0.55	0.31	0.14	0.70	0.64		0.58	0.68	

Intersection Summary
Cycle Length: 140

Actuated Cycle Length: 140
Offset: 84 (60%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 110
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.79
Intersection Signal Delay: 32.3 Intersection LOS: C
Intersection Capacity Utilization 80.7% ICU Level of Service D
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 15: Hespeler Rd & Dunbar Rd

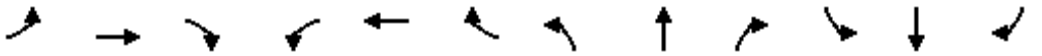


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	15	16	13	300	32	33	57	1313	279	63	868	25
Confl. Peds. (#/hr)	13					13	5		1	1		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.61	0.61	0.61	0.89	0.89	0.89	0.97	0.97	0.97	0.81	0.81	0.81
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	3%	0%	4%	0%	5%	6%	9%	10%	4%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	25	26	21	337	73	0	59	1642	0	78	1103	0
Turn Type	Perm	NA	Perm	pm+pt	NA		Prot	NA		Prot	NA	
Protected Phases		4		3	8		5	2		1	6	
Permitted Phases	4		4	8								
Detector Phase	4	4	4	3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	5.0	8.0		5.0	10.0		5.0	10.0	
Minimum Split (s)	36.0	36.0	36.0	12.0	36.0		11.0	31.0		11.0	31.0	
Total Split (s)	36.0	36.0	36.0	15.0	51.0		15.0	77.0		12.0	74.0	
Total Split (%)	25.7%	25.7%	25.7%	10.7%	36.4%		10.7%	55.0%		8.6%	52.9%	
Yellow Time (s)	4.0	4.0	4.0	3.0	4.0		3.0	4.0		3.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	1.0	2.0		2.0	2.0		2.0	2.0	
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)	6.0	6.0	6.0	4.0	6.0		5.0	6.0		5.0	6.0	
Lead/Lag	Lag	Lag	Lag	Lead			Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		None	C-Max		None	C-Max	
Act Effct Green (s)	10.3	10.3	10.3	24.1	22.1		9.9	87.1		13.8	93.2	
Actuated g/C Ratio	0.07	0.07	0.07	0.17	0.16		0.07	0.62		0.10	0.67	
v/c Ratio	0.26	0.19	0.10	1.50	0.24		0.46	0.79		0.48	0.51	
Control Delay	68.1	64.1	1.0	287.8	28.6		71.1	10.9		93.5	4.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	68.1	64.1	1.0	287.8	28.6		71.1	10.9		93.5	4.0	
LOS	E	E	A	F	C		E	B		F	A	
Approach Delay		47.1			241.7			13.0			9.9	
Approach LOS		D			F			B			A	
Queue Length 50th (m)	7.0	7.3	0.0	~130.3	8.9		16.8	65.4		22.5	41.2	
Queue Length 95th (m)	11.5	11.7	0.0	#187.2	23.0		m29.6	89.0		38.1	17.6	
Internal Link Dist (m)		16.2			159.9			360.5			240.5	
Turn Bay Length (m)							35.0			100.0		
Base Capacity (vph)	283	407	419	224	569		141	2084		163	2178	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.09	0.06	0.05	1.50	0.13		0.42	0.79		0.48	0.51	

Intersection Summary
Cycle Length: 140

Actuated Cycle Length: 140
Offset: 105 (75%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 120
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.50
Intersection Signal Delay: 40.5 Intersection LOS: D
Intersection Capacity Utilization 86.2% ICU Level of Service E
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 16: Hespeler Rd & Can Amera Pkwy

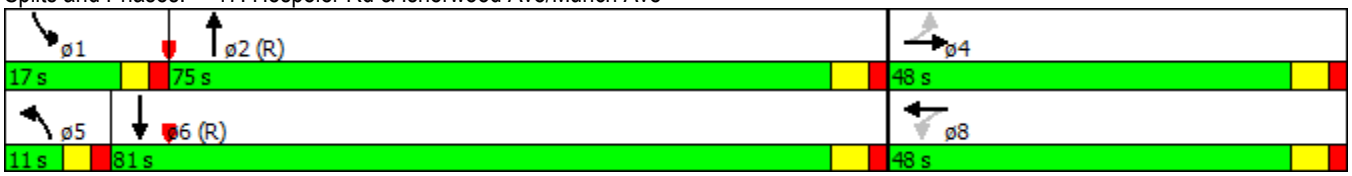


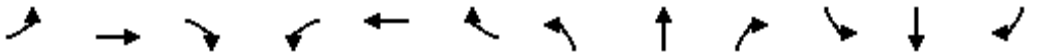
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	78	12	36	73	14	343	31	1153	37	65	948	189
Confl. Peds. (#/hr)	3		2	2		3	3		11	11		3
Confl. Bikes (#/hr)												
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	1%	0%	4%	0%	20%	1%	0%	4%	0%	1%	3%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	78	48	0	73	357	0	31	1190	0	65	1137	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Detector Phase	4	4		8	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		5.0	10.0		5.0	10.0	
Minimum Split (s)	34.0	34.0		34.0	34.0		10.0	24.0		10.0	24.0	
Total Split (s)	48.0	48.0		48.0	48.0		11.0	75.0		17.0	81.0	
Total Split (%)	34.3%	34.3%		34.3%	34.3%		7.9%	53.6%		12.1%	57.9%	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	4.0		3.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		5.0	6.0		5.0	6.0	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Act Effct Green (s)	26.5	26.5		26.5	26.5		7.7	88.4		10.4	93.2	
Actuated g/C Ratio	0.19	0.19		0.19	0.19		0.06	0.63		0.07	0.67	
v/c Ratio	1.47	0.14		0.28	0.87		0.31	0.55		0.49	0.50	
Control Delay	326.1	17.7		48.4	52.9		94.5	3.8		71.6	8.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	326.1	17.7		48.4	52.9		94.5	3.8		71.6	8.9	
LOS	F	B		D	D		F	A		E	A	
Approach Delay		208.6			52.1			6.1			12.3	
Approach LOS		F			D			A			B	
Queue Length 50th (m)	~30.9	2.9		18.4	64.3		9.6	3.5		17.6	62.1	
Queue Length 95th (m)	#59.4	13.0		30.6	94.8		m9.4	m105.0		m28.9	m68.3	
Internal Link Dist (m)		27.2			68.8			266.1			360.5	
Turn Bay Length (m)				25.0			25.0			80.0		
Base Capacity (vph)	85	510		412	570		100	2179		159	2282	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.92	0.09		0.18	0.63		0.31	0.55		0.41	0.50	

Intersection Summary
Cycle Length: 140

Actuated Cycle Length: 140
Offset: 98 (70%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.47
Intersection Signal Delay: 23.8 Intersection LOS: C
Intersection Capacity Utilization 85.5% ICU Level of Service E
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 17: Hespeler Rd & Isherwood Ave/Munch Ave





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	1	12	182	6	78	14	1641	95	60	945	14
Confl. Peds. (#/hr)	13		11	11		13	13		16	16		13
Confl. Bikes (#/hr)												
Peak Hour Factor	0.64	0.64	0.64	0.83	0.83	0.83	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	20%	0%	8%	3%	0%	8%	8%	5%	3%	9%	8%	8%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	8	21	0	219	101	0	14	1692	98	62	974	14
Turn Type	Perm	NA		Perm	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6
Detector Phase	4	4		8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		4.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	41.0	41.0		41.0	41.0		9.5	25.0	25.0	10.0	25.0	25.0
Total Split (s)	41.0	41.0		41.0	41.0		10.6	76.0	76.0	11.0	76.4	76.4
Total Split (%)	29.3%	29.3%		29.3%	29.3%		7.6%	54.3%	54.3%	7.9%	54.6%	54.6%
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0		6.0	6.0		5.0	6.0	6.0	5.0	6.0	6.0
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes				Yes	Yes
Recall Mode	None	None		None	None		None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	27.3	27.3		27.3	27.3		5.6	70.0	70.0	6.0	76.8	76.8
Actuated g/C Ratio	0.20	0.20		0.20	0.20		0.04	0.50	0.50	0.04	0.55	0.55
v/c Ratio	0.04	0.07		0.83	0.28		0.21	0.98	0.12	0.89	0.53	0.02
Control Delay	42.2	17.7		78.3	11.3		72.9	52.8	0.8	138.3	24.4	0.0
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.2	17.7		78.3	11.3		72.9	52.8	0.8	138.3	24.4	0.0
LOS	D	B		E	B		E	D	A	F	C	A
Approach Delay		24.5			57.2			50.1			30.8	
Approach LOS		C			E			D			C	
Queue Length 50th (m)	1.9	0.5		61.6	1.7		4.0	249.4	0.0	17.3	128.4	0.0
Queue Length 95th (m)	4.5	4.3		79.1	13.8		12.0	#309.4	2.2	#48.0	154.6	m0.0
Internal Link Dist (m)		25.4			59.1			163.9			379.0	
Turn Bay Length (m)				40.0			30.0		50.0	30.0		30.0
Base Capacity (vph)	263	388		338	441		66	1719	794	70	1833	829
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.05		0.65	0.23		0.21	0.98	0.12	0.89	0.53	0.02

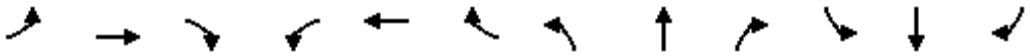
Intersection Summary
Cycle Length: 140

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Growth Factor	
Heavy Vehicles (%)	
Bus Blockages (#/hr)	
Parking (#/hr)	
Mid-Block Traffic (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	12.0
Total Split (s)	12.0
Total Split (%)	9%
Yellow Time (s)	5.0
All-Red Time (s)	6.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	Max
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (m)	
Queue Length 95th (m)	
Internal Link Dist (m)	
Turn Bay Length (m)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Actuated Cycle Length: 140
Offset: 33 (24%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 130
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.98
Intersection Signal Delay: 44.3 Intersection LOS: D
Intersection Capacity Utilization 81.0% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 18: Hespeler Rd & Jaffray St/Avenue Rd



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	90	166	32	33	188	82	33	182	56	21	36	47
Confl. Peds. (#/hr)	35		21	21		35	31		29	29		31
Confl. Bikes (#/hr)												
Peak Hour Factor	0.91	0.91	0.91	0.93	0.93	0.93	0.81	0.81	0.81	0.85	0.85	0.85
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	13%	1%	10%	13%	3%	2%	15%	8%	11%	9%	13%	8%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	99	217	0	35	290	0	41	294	0	25	97	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		2			6		3	8		7	4	
Permitted Phases	2			6								
Detector Phase	2	2		6	6		3	8		7	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		4.0	5.0		4.0	5.0	
Minimum Split (s)	25.0	25.0		25.0	25.0		9.0	27.0		9.0	27.0	
Total Split (s)	38.5	38.5		38.5	38.5		14.0	34.0		10.0	30.0	
Total Split (%)	42.8%	42.8%		42.8%	42.8%		15.6%	37.8%		11.1%	33.3%	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	4.0		3.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		5.0	6.0		5.0	6.0	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Recall Mode	Min	Min		Min	Min		None	None		None	None	
Act Effct Green (s)	14.5	14.5		14.5	14.5		7.3	14.8		5.4	13.8	
Actuated g/C Ratio	0.27	0.27		0.27	0.27		0.14	0.28		0.10	0.26	
v/c Ratio	0.45	0.44		0.13	0.60		0.19	0.63		0.15	0.23	
Control Delay	26.4	20.1		18.9	22.9		29.0	24.1		32.3	12.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	26.4	20.1		18.9	22.9		29.0	24.1		32.3	12.3	
LOS	C	C		B	C		C	C		C	B	
Approach Delay		22.1			22.5			24.7			16.4	
Approach LOS		C			C			C			B	
Queue Length 50th (m)	6.7	13.8		2.2	18.6		3.1	19.7		2.0	2.6	
Queue Length 95th (m)	26.4	43.6		10.7	57.6		13.6	51.8		10.7	15.1	
Internal Link Dist (m)		51.5			56.6			26.2			35.7	
Turn Bay Length (m)	20.0			20.0						20.0		
Base Capacity (vph)	532	1184		662	1133		286	947		168	757	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.19	0.18		0.05	0.26		0.14	0.31		0.15	0.13	

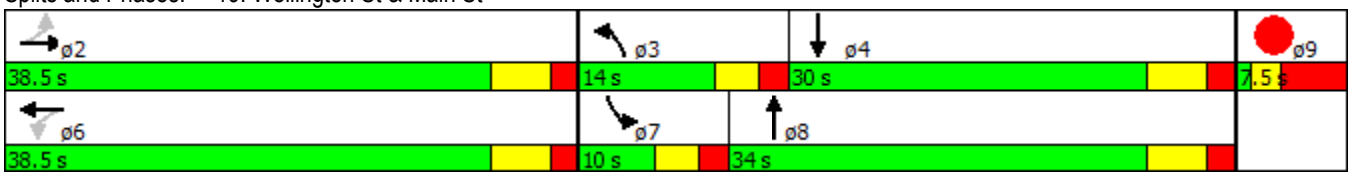
Intersection Summary
Cycle Length: 90

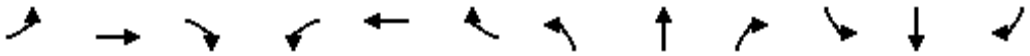
Lane Group	ø9
Lane Configurations	
Volume (vph)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Growth Factor	
Heavy Vehicles (%)	
Bus Blockages (#/hr)	
Parking (#/hr)	
Mid-Block Traffic (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	7.5
Total Split (s)	7.5
Total Split (%)	8%
Yellow Time (s)	2.0
All-Red Time (s)	4.5
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	Max
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (m)	
Queue Length 95th (m)	
Internal Link Dist (m)	
Turn Bay Length (m)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Actuated Cycle Length: 53.6	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.63	
Intersection Signal Delay: 22.4	Intersection LOS: C
Intersection Capacity Utilization 53.3%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 19: Wellington St & Main St





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	170	113	2	43	0	80	0	30	10	49	118	0
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	8%	0%	0%	0%	20%	0%	10%	0%	5%	0%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	317	0	0	137	0	0	44	0	54	131	0
Turn Type	Perm	NA		Perm	NA			NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8						6		
Detector Phase	4	4		8	8			2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0			5.0		5.0	5.0	
Minimum Split (s)	27.0	27.0		27.0	27.0			27.0		27.0	27.0	
Total Split (s)	48.0	48.0		48.0	48.0			34.5		34.5	34.5	
Total Split (%)	53.3%	53.3%		53.3%	53.3%			38.3%		38.3%	38.3%	
Yellow Time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0			2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0		0.0	0.0	
Total Lost Time (s)		6.0			6.0			6.0		6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None			Min		Min	Min	
Act Effct Green (s)		13.9			13.9			8.6		8.6	8.6	
Actuated g/C Ratio		0.33			0.33			0.20		0.20	0.20	
v/c Ratio		0.63			0.28			0.12		0.20	0.34	
Control Delay		18.4			5.3			13.3		17.3	18.2	
Queue Delay		0.0			0.0			0.0		0.0	0.0	
Total Delay		18.4			5.3			13.3		17.3	18.2	
LOS		B			A			B		B	B	
Approach Delay		18.4			5.3			13.3			17.9	
Approach LOS		B			A			B			B	
Queue Length 50th (m)		19.5			1.1			2.0		3.4	8.5	
Queue Length 95th (m)		42.4			9.8			9.0		11.8	22.7	
Internal Link Dist (m)		68.8			103.6			15.3			241.2	
Turn Bay Length (m)										25.0		
Base Capacity (vph)		1461			1191			1174		903	1303	
Starvation Cap Reductn		12			0			0		0	0	
Spillback Cap Reductn		0			0			0		0	0	
Storage Cap Reductn		0			0			0		0	0	
Reduced v/c Ratio		0.22			0.12			0.04		0.06	0.10	

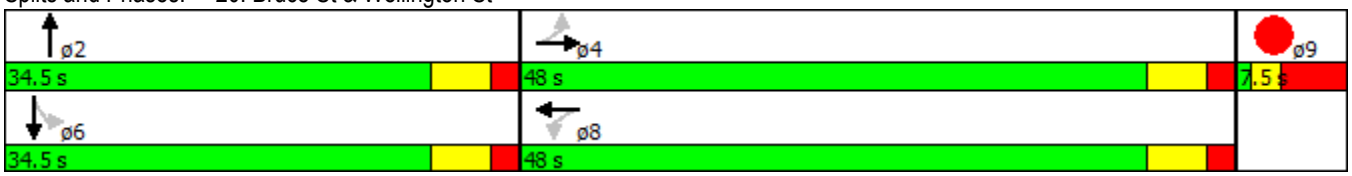
Intersection Summary
Cycle Length: 90

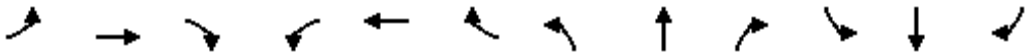
Lane Group	ø9
Lane Configurations	
Volume (vph)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Growth Factor	
Heavy Vehicles (%)	
Bus Blockages (#/hr)	
Parking (#/hr)	
Mid-Block Traffic (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	7.5
Total Split (s)	7.5
Total Split (%)	8%
Yellow Time (s)	2.0
All-Red Time (s)	4.5
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	Max
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (m)	
Queue Length 95th (m)	
Internal Link Dist (m)	
Turn Bay Length (m)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Actuated Cycle Length: 42.3	
Natural Cycle: 65	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.63	
Intersection Signal Delay: 15.3	Intersection LOS: B
Intersection Capacity Utilization 41.5%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 20: Bruce St & Wellington St



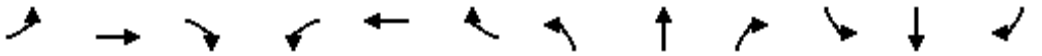


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	60	0	0	0	0	0	508	82	56	538	60
Confl. Peds. (#/hr)	2		3	3		2	17		23	23		17
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	100%	0%	0%	0%	0%	0%	7%	0%	0%	4%	100%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	67	0	0	0	0	0	655	0	0	727	0
Turn Type		NA						NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases										6		
Detector Phase		4						2		6	6	
Switch Phase												
Minimum Initial (s)		5.0						5.0		5.0	5.0	
Minimum Split (s)		27.0						27.0		27.0	27.0	
Total Split (s)		27.0						63.0		63.0	63.0	
Total Split (%)		30.0%						70.0%		70.0%	70.0%	
Yellow Time (s)		4.0						4.0		4.0	4.0	
All-Red Time (s)		2.0						2.0		2.0	2.0	
Lost Time Adjust (s)		0.0						0.0			0.0	
Total Lost Time (s)		6.0						6.0			6.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		None						Min		Min	Min	
Act Effct Green (s)		11.3						51.3			51.3	
Actuated g/C Ratio		0.18						0.81			0.81	
v/c Ratio		0.40						0.47			0.60	
Control Delay		37.4						6.5			9.2	
Queue Delay		0.0						0.0			0.0	
Total Delay		37.4						6.5			9.2	
LOS		D						A			A	
Approach Delay		37.4						6.5			9.2	
Approach LOS		D						A			A	
Queue Length 50th (m)		8.3						37.6			51.2	
Queue Length 95th (m)		24.5						82.0			119.3	
Internal Link Dist (m)		95.9			68.8			21.8			90.7	
Turn Bay Length (m)												
Base Capacity (vph)		368						1470			1270	
Starvation Cap Reductn		0						0			0	
Spillback Cap Reductn		0						0			0	
Storage Cap Reductn		0						0			0	
Reduced v/c Ratio		0.18						0.45			0.57	

Intersection Summary
Cycle Length: 90

Actuated Cycle Length: 63.7	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.60	
Intersection Signal Delay: 9.3	Intersection LOS: A
Intersection Capacity Utilization 87.7%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 21: Bruce St & Ainslie St

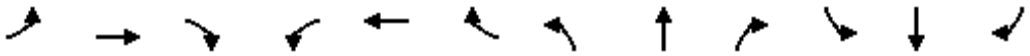


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	310	2	75	26	32	24	114	1470	22	24	2247	327
Confl. Peds. (#/hr)			5	5					1	1		
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	3%	0%	0%	0%	2%	0%	0%	2%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	344	85	0	29	63	0	127	1657	0	27	2497	363
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								6
Detector Phase	4	4		8	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		5.0	20.0		5.0	20.0	20.0
Minimum Split (s)	34.1	34.1		34.1	34.1		10.0	33.5		10.0	33.5	33.5
Total Split (s)	38.0	38.0		38.0	38.0		13.0	92.0		10.0	89.0	89.0
Total Split (%)	27.1%	27.1%		27.1%	27.1%		9.3%	65.7%		7.1%	63.6%	63.6%
Yellow Time (s)	3.3	3.3		3.3	3.3		3.0	3.7		3.0	3.7	3.7
All-Red Time (s)	3.8	3.8		3.8	3.8		2.0	3.8		2.0	3.8	3.8
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)	7.1	7.1		7.1	7.1		5.0	7.5		5.0	7.5	7.5
Lead/Lag							Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	C-Max
Act Effct Green (s)	30.9	30.9		30.9	30.9		8.0	88.5		5.0	81.5	81.5
Actuated g/C Ratio	0.22	0.22		0.22	0.22		0.06	0.63		0.04	0.58	0.58
v/c Ratio	1.15	0.21		0.10	0.15		1.23	0.74		0.42	1.21	0.36
Control Delay	145.6	16.0		44.8	29.4		208.5	11.1		85.8	128.8	8.0
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	145.6	16.0		44.8	29.4		208.5	11.1		85.8	128.8	8.0
LOS	F	B		D	C		F	B		F	F	A
Approach Delay		119.9			34.2			25.2			113.2	
Approach LOS		F			C			C			F	
Queue Length 50th (m)	~117.3	4.4		6.8	8.9		~46.5	47.6		7.9	~466.8	23.3
Queue Length 95th (m)	#180.7	19.3		16.2	22.0		m#80.7	107.4		18.7	#506.9	43.1
Internal Link Dist (m)		79.9			78.0			194.3			108.8	
Turn Bay Length (m)							60.0			45.0		
Base Capacity (vph)	300	402		283	411		103	2233		64	2060	1018
Starvation Cap Reductn	0	0		0	0		0	1		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	1.15	0.21		0.10	0.15		1.23	0.74		0.42	1.21	0.36

Intersection Summary
Cycle Length: 140

Actuated Cycle Length: 140
Offset: 78 (56%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.23
Intersection Signal Delay: 82.1 Intersection LOS: F
Intersection Capacity Utilization 108.6% ICU Level of Service G
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: King St & Deer Ridge Dr

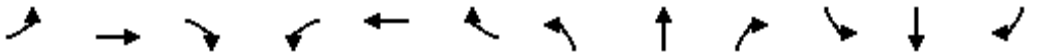


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	49	55	124	17	28	135	62	1229	10	115	1470	19
Confl. Peds. (#/hr)	17		2	2		17			1	1		
Confl. Bikes (#/hr)												
Peak Hour Factor	0.74	0.74	0.74	0.95	0.95	0.95	0.90	0.90	0.90	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	0%	2%	0%	2%	0%	0%	2%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	66	242	0	18	171	0	69	1377	0	120	1551	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Detector Phase	4	4		8	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	27.0	27.0		27.0	27.0		10.0	22.0		10.0	22.0	
Total Split (s)	36.0	36.0		36.0	36.0		16.0	82.0		22.0	88.0	
Total Split (%)	25.7%	25.7%		25.7%	25.7%		11.4%	58.6%		15.7%	62.9%	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	4.0		3.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		5.0	6.0		5.0	6.0	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		None	C-Max		Max	C-Max	
Act Effct Green (s)	19.9	19.9		19.9	19.9		10.3	76.0		27.1	95.2	
Actuated g/C Ratio	0.14	0.14		0.14	0.14		0.07	0.54		0.19	0.68	
v/c Ratio	0.58	0.80		0.31	0.50		0.52	0.72		0.34	0.65	
Control Delay	74.4	58.9		64.4	17.1		87.3	6.3		76.5	2.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.5	
Total Delay	74.4	58.9		64.4	17.1		87.3	6.3		76.5	2.9	
LOS	E	E		E	B		F	A		E	A	
Approach Delay		62.2			21.6			10.2			8.2	
Approach LOS		E			C			B			A	
Queue Length 50th (m)	18.2	48.6		4.8	7.5		20.7	23.2		37.1	14.2	
Queue Length 95th (m)	26.5	55.2		12.7	28.5		m31.1	25.8		m32.0	m13.5	
Internal Link Dist (m)		46.0			33.8			137.9			194.3	
Turn Bay Length (m)							60.0			80.0		
Base Capacity (vph)	172	419		90	448		149	1920		349	2401	
Starvation Cap Reductn	0	0		0	0		0	0		0	398	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.38	0.58		0.20	0.38		0.46	0.72		0.34	0.77	

Intersection Summary
Cycle Length: 140

Actuated Cycle Length: 140
Offset: 94 (67%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.80
Intersection Signal Delay: 14.3 Intersection LOS: B
Intersection Capacity Utilization 86.8% ICU Level of Service E
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: King St & Sportsworld Crossing Rd

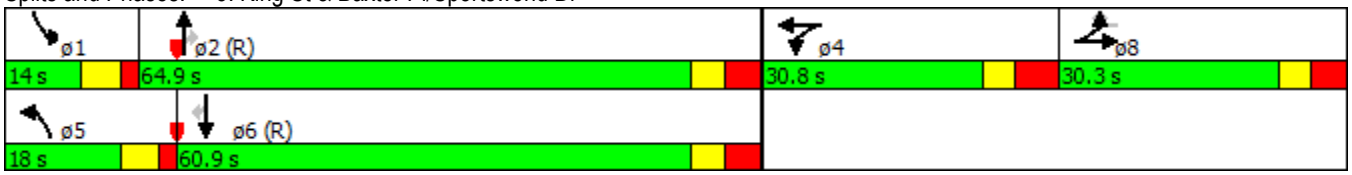


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	46	56	107	393	42	62	145	1086	182	141	1328	60
Confl. Peds. (#/hr)	1		1	1		1			1	1		
Confl. Bikes (#/hr)												
Peak Hour Factor	0.88	0.88	0.88	0.84	0.84	0.84	0.92	0.92	0.92	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	4%	3%	8%	0%	1%	0%	2%	5%	1%	2%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)				45%								
Lane Group Flow (vph)	52	186	0	257	261	74	158	1180	198	152	1428	65
Turn Type	Split	NA		Split	NA	custom	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	8	8		4	4		5	2		1	6	
Permitted Phases						8			2			6
Detector Phase	8	8		4	4	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	8.0	8.0		10.0	10.0	8.0	6.0	20.0	20.0	7.0	20.0	20.0
Minimum Split (s)	30.3	30.3		30.8	30.8	30.3	12.0	27.5	27.5	13.0	27.5	27.5
Total Split (s)	30.3	30.3		30.8	30.8	30.3	18.0	64.9	64.9	14.0	60.9	60.9
Total Split (%)	21.6%	21.6%		22.0%	22.0%	21.6%	12.9%	46.4%	46.4%	10.0%	43.5%	43.5%
Yellow Time (s)	3.3	3.3		3.3	3.3	3.3	4.0	3.7	3.7	4.0	3.7	3.7
All-Red Time (s)	4.0	4.0		4.5	4.5	4.0	2.0	3.8	3.8	2.0	3.8	3.8
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.3	7.3		7.8	7.8	7.3	6.0	7.5	7.5	6.0	7.5	7.5
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None		None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	10.0	10.0		23.0	23.0	10.0	20.4	66.6	66.6	11.7	57.9	57.9
Actuated g/C Ratio	0.07	0.07		0.16	0.16	0.07	0.15	0.48	0.48	0.08	0.41	0.41
v/c Ratio	0.42	0.57		0.99	0.98	0.30	0.60	0.70	0.25	0.52	0.98	0.09
Control Delay	72.1	32.1		110.7	107.3	3.1	47.2	38.7	15.3	54.4	63.7	1.6
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	72.1	32.1		110.7	107.3	3.1	47.2	38.7	15.3	54.4	63.7	1.6
LOS	E	C		F	F	A	D	D	B	D	E	A
Approach Delay		40.8			95.8			36.6			60.4	
Approach LOS		D			F			D			E	
Queue Length 50th (m)	14.8	10.8		79.5	80.7	0.0	40.1	183.5	28.6	23.2	183.4	0.0
Queue Length 95th (m)	28.2	22.4		#125.7	#126.8	0.0	m61.0	m209.8	m52.7	34.9	#281.8	m1.3
Internal Link Dist (m)		25.1			83.4			489.7			202.0	
Turn Bay Length (m)							50.0		50.0	110.0		55.0
Base Capacity (vph)	282	607		260	267	378	263	1684	795	290	1464	731
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.31		0.99	0.98	0.20	0.60	0.70	0.25	0.52	0.98	0.09

Intersection Summary
Cycle Length: 140

Actuated Cycle Length: 140
Offset: 88 (63%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 145
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.99
Intersection Signal Delay: 55.3 Intersection LOS: E
Intersection Capacity Utilization 87.8% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: King St & Baxter Pl/Sportsworld Dr



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	541	55	1259	37	43	2080
Confl. Peds. (#/hr)		1		1	1	
Confl. Bikes (#/hr)						
Peak Hour Factor	0.82	0.82	0.92	0.92	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	1%	0%	3%	3%	0%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	727	0	1408	0	45	2189
Turn Type	Prot		NA		Prot	NA
Protected Phases	8		2		1	6
Permitted Phases						
Detector Phase	8		2		1	6
Switch Phase						
Minimum Initial (s)	10.0		25.0		5.0	25.0
Minimum Split (s)	33.0		31.0		10.0	31.0
Total Split (s)	38.0		88.0		14.0	102.0
Total Split (%)	27.1%		62.9%		10.0%	72.9%
Yellow Time (s)	4.0		4.0		3.0	4.0
All-Red Time (s)	2.0		2.0		2.0	2.0
Lost Time Adjust (s)	0.0		0.0		0.0	0.0
Total Lost Time (s)	6.0		6.0		5.0	6.0
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?						
Recall Mode	None		C-Max		None	C-Max
Act Effct Green (s)	31.4		85.7		8.0	96.6
Actuated g/C Ratio	0.22		0.61		0.06	0.69
v/c Ratio	0.94		0.66		0.44	0.90
Control Delay	72.9		20.3		88.7	12.7
Queue Delay	0.0		0.0		0.0	0.0
Total Delay	72.9		20.3		88.7	12.7
LOS	E		C		F	B
Approach Delay	72.9		20.3			14.2
Approach LOS	E		C			B
Queue Length 50th (m)	106.5		142.9		12.0	263.6
Queue Length 95th (m)	117.0		168.8		m14.4	m275.5
Internal Link Dist (m)	81.1		69.3			489.7
Turn Bay Length (m)					50.0	
Base Capacity (vph)	791		2138		116	2419
Starvation Cap Reductn	0		0		0	0
Spillback Cap Reductn	0		0		0	0
Storage Cap Reductn	0		0		0	0
Reduced v/c Ratio	0.92		0.66		0.39	0.90

Intersection Summary
Cycle Length: 140

Actuated Cycle Length: 140
Offset: 132 (94%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.94
Intersection Signal Delay: 25.9 Intersection LOS: C
Intersection Capacity Utilization 84.7% ICU Level of Service E
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

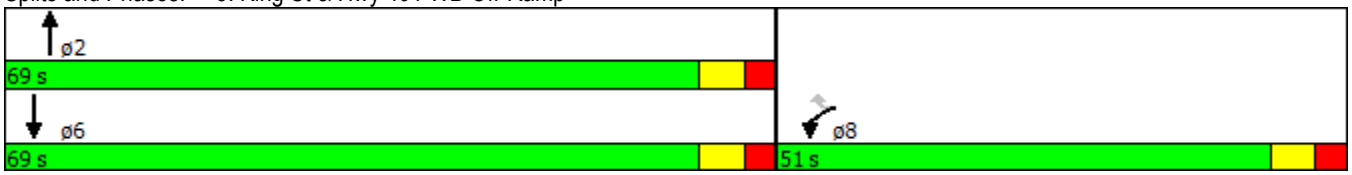
Splits and Phases: 4: King St & Tu Ln St

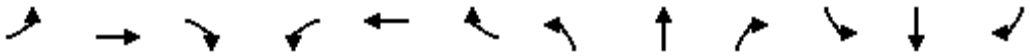
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	117	604	1207	0	0	1718
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	4%	0%	0%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	130	671	1341	0	0	1909
Turn Type	Prot	Perm	NA			NA
Protected Phases	8		2			6
Permitted Phases		8				
Detector Phase	8	8	2			6
Switch Phase						
Minimum Initial (s)	10.0	10.0	20.0			20.0
Minimum Split (s)	30.0	30.0	30.0			27.0
Total Split (s)	51.0	51.0	69.0			69.0
Total Split (%)	42.5%	42.5%	57.5%			57.5%
Yellow Time (s)	4.0	4.0	4.0			4.0
All-Red Time (s)	3.0	3.0	3.0			3.0
Lost Time Adjust (s)	0.0	0.0	0.0			0.0
Total Lost Time (s)	7.0	7.0	7.0			7.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	Max			Max
Act Effct Green (s)	44.0	44.0	62.0			62.0
Actuated g/C Ratio	0.37	0.37	0.52			0.52
v/c Ratio	0.20	1.12	0.75			1.03
Control Delay	27.1	107.6	26.1			59.5
Queue Delay	0.0	0.0	0.0			0.0
Total Delay	27.1	107.6	26.1			59.5
LOS	C	F	C			E
Approach Delay	94.5		26.1			59.5
Approach LOS	F		C			E
Queue Length 50th (m)	21.8	~186.0	133.1			~267.5
Queue Length 95th (m)	37.1	#261.1	161.5			#312.1
Internal Link Dist (m)	84.8		273.9			107.6
Turn Bay Length (m)						
Base Capacity (vph)	649	601	1793			1846
Starvation Cap Reductn	0	0	0			0
Spillback Cap Reductn	0	0	0			0
Storage Cap Reductn	0	0	0			0
Reduced v/c Ratio	0.20	1.12	0.75			1.03

Intersection Summary
Cycle Length: 120

Actuated Cycle Length: 120
Natural Cycle: 120
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.12
Intersection Signal Delay: 55.4 Intersection LOS: E
Intersection Capacity Utilization 93.3% ICU Level of Service F
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 5: King St & Hwy 401 WB Off-Ramp





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	450	0	100	0	0	0	0	841	0	528	1225	0
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	0%	2%	0%	0%	0%	0%	2%	0%	3%	1%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	500	0	111	0	0	0	0	934	0	587	1361	0
Turn Type	Prot		Perm					NA		Prot	NA	
Protected Phases	4							2		1	6	
Permitted Phases			4									
Detector Phase	4		4					2		1	6	
Switch Phase												
Minimum Initial (s)	10.0		10.0					20.0		5.0	20.0	
Minimum Split (s)	32.0		32.0					27.0		10.0	32.0	
Total Split (s)	42.0		42.0					38.0		40.0	78.0	
Total Split (%)	35.0%		35.0%					31.7%		33.3%	65.0%	
Yellow Time (s)	4.0		4.0					4.0		3.0	4.0	
All-Red Time (s)	3.0		3.0					3.0		2.0	3.0	
Lost Time Adjust (s)	0.0		0.0					0.0		0.0	0.0	
Total Lost Time (s)	7.0		7.0					7.0		5.0	7.0	
Lead/Lag								Lag		Lead		
Lead-Lag Optimize?												
Recall Mode	None		None					Max		None	Max	
Act Effct Green (s)	34.9		34.9					31.0		35.0	71.0	
Actuated g/C Ratio	0.29		0.29					0.26		0.29	0.59	
v/c Ratio	0.97		0.21					1.02		1.15	0.64	
Control Delay	75.9		11.9					79.1		126.4	17.9	
Queue Delay	0.0		0.0					0.0		0.0	0.0	
Total Delay	75.9		11.9					79.1		126.4	17.9	
LOS	E		B					E		F	B	
Approach Delay								79.1			50.6	
Approach LOS								E			D	
Queue Length 50th (m)	122.4		5.2					~129.4		~171.0	110.7	
Queue Length 95th (m)	#192.3		19.3					#171.2		#242.2	133.7	
Internal Link Dist (m)		74.1			49.5			213.0			273.9	
Turn Bay Length (m)										185.0		
Base Capacity (vph)	517		520					915		511	2117	
Starvation Cap Reductn	0		0					0		0	0	
Spillback Cap Reductn	0		0					0		0	0	
Storage Cap Reductn	0		0					0		0	0	
Reduced v/c Ratio	0.97		0.21					1.02		1.15	0.64	

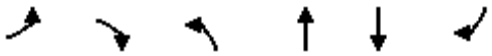
Intersection Summary
Cycle Length: 120

Actuated Cycle Length: 119.9	
Natural Cycle: 140	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.15	
Intersection Signal Delay: 60.6	Intersection LOS: E
Intersection Capacity Utilization 93.3%	ICU Level of Service F
Analysis Period (min) 15	

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Splits and Phases: 6: Hwy 401 EB Off-Ramp & King St

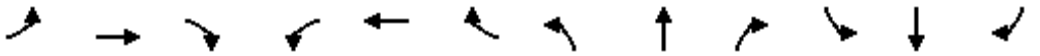


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	257	61	82	374	556	344
Confl. Peds. (#/hr)	8	1	1			1
Confl. Bikes (#/hr)						
Peak Hour Factor	0.97	0.97	0.87	0.87	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	0%	1%	2%	1%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	265	63	94	430	947	0
Turn Type	Prot	Perm	Prot	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases		4				
Detector Phase	4	4	5	2	6	
Switch Phase						
Minimum Initial (s)	7.0	7.0	5.0	5.0	5.0	
Minimum Split (s)	36.0	36.0	10.0	29.0	29.0	
Total Split (s)	40.0	40.0	19.0	70.0	51.0	
Total Split (%)	36.4%	36.4%	17.3%	63.6%	46.4%	
Yellow Time (s)	4.0	4.0	3.0	4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	5.0	6.0	6.0	
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?						
Recall Mode	None	None	None	C-Max	C-Max	
Act Effct Green (s)	22.0	22.0	11.1	76.0	62.3	
Actuated g/C Ratio	0.20	0.20	0.10	0.69	0.57	
v/c Ratio	0.76	0.17	0.53	0.18	0.49	
Control Delay	55.0	9.2	56.8	6.8	14.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	55.0	9.2	56.8	6.8	14.8	
LOS	D	A	E	A	B	
Approach Delay	46.2			15.8	14.8	
Approach LOS	D			B	B	
Queue Length 50th (m)	56.9	0.0	20.5	16.0	56.2	
Queue Length 95th (m)	79.5	10.5	34.9	26.5	92.8	
Internal Link Dist (m)	60.5			156.7	213.0	
Turn Bay Length (m)	25.0		30.0			
Base Capacity (vph)	541	536	231	2445	1949	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.49	0.12	0.41	0.18	0.49	

Intersection Summary
Cycle Length: 110

Actuated Cycle Length: 110	
Offset: 85 (77%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.76	
Intersection Signal Delay: 20.8	Intersection LOS: C
Intersection Capacity Utilization 59.7%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 7: Shantz Hill Rd & Preston Pwky



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	38	34	330	6	697	39	259	612	46
Confl. Peds. (#/hr)				20		5			10	10		
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.91	0.91	0.91	0.93	0.93	0.93	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	6%	3%	0%	4%	3%	6%	3%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	79	363	6	749	42	273	644	48
Turn Type				Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases					8		5	2		1	6	
Permitted Phases				8		8	2		2	6		6
Detector Phase				8	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)				8.0	8.0	8.0	5.0	10.0	10.0	4.0	10.0	10.0
Minimum Split (s)				30.0	30.0	30.0	9.0	25.0	25.0	8.0	25.0	25.0
Total Split (s)				30.0	30.0	30.0	9.0	36.5	36.5	16.0	43.5	43.5
Total Split (%)				33.3%	33.3%	33.3%	10.0%	40.6%	40.6%	17.8%	48.3%	48.3%
Yellow Time (s)				4.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)				2.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)					0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)					6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?								Yes	Yes	Yes		
Recall Mode				None	None	None	Max	C-Max	C-Max	None	Max	Max
Act Effct Green (s)					17.4	17.4	38.0	31.0	31.0	48.5	37.5	37.5
Actuated g/C Ratio					0.19	0.19	0.42	0.34	0.34	0.54	0.42	0.42
v/c Ratio					0.23	0.70	0.03	0.63	0.06	0.73	0.84	0.06
Control Delay					30.9	41.2	10.7	27.7	0.2	24.1	35.4	0.2
Queue Delay					0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay					30.9	41.2	10.7	27.7	0.2	24.1	35.4	0.2
LOS					C	D	B	C	A	C	D	A
Approach Delay					39.4			26.1			30.4	
Approach LOS					D			C			C	
Queue Length 50th (m)					12.2	35.3	0.5	59.7	0.0	25.7	102.3	0.0
Queue Length 95th (m)					23.1	48.4	2.3	79.6	0.0	#49.0	#165.5	0.0
Internal Link Dist (m)		85.2			196.5			54.2			93.0	
Turn Bay Length (m)							25.0		30.0			35.0
Base Capacity (vph)					472	712	234	1195	649	383	768	768
Starvation Cap Reductn					0	0	0	0	0	0	0	0
Spillback Cap Reductn					0	0	0	0	0	0	0	0
Storage Cap Reductn					0	0	0	0	0	0	0	0
Reduced v/c Ratio					0.17	0.51	0.03	0.63	0.06	0.71	0.84	0.06

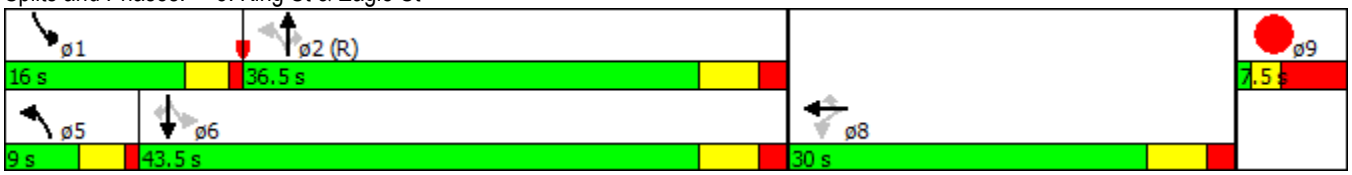
Intersection Summary
Cycle Length: 90

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Growth Factor	
Heavy Vehicles (%)	
Bus Blockages (#/hr)	
Parking (#/hr)	
Mid-Block Traffic (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	7.5
Total Split (s)	7.5
Total Split (%)	8%
Yellow Time (s)	2.0
All-Red Time (s)	4.5
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	Max
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (m)	
Queue Length 95th (m)	
Internal Link Dist (m)	
Turn Bay Length (m)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

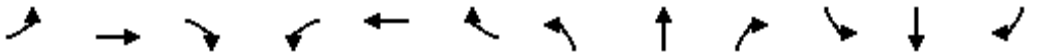
Intersection Summary

Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 30.6 Intersection LOS: C
Intersection Capacity Utilization 57.8% ICU Level of Service B
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 8: King St & Eagle St



9: Hespeler Rd & Travelodge Access



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	139	4	51	5	0	21	90	1477	9	24	1125	128
Confl. Peds. (#/hr)	3					3	1		2	2		1
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	0%	1%	0%	0%	0%	0%	4%	0%	0%	5%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	154	61	0	6	23	0	100	1651	0	27	1392	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Detector Phase	4	4		8	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		7.0	10.0		7.0	10.0	
Minimum Split (s)	35.0	35.0		35.0	35.0		12.0	25.0		12.0	25.0	
Total Split (s)	35.0	35.0		35.0	35.0		17.0	81.0		12.0	76.0	
Total Split (%)	25.0%	25.0%		25.0%	25.0%		12.1%	57.9%		8.6%	54.3%	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	4.0		3.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		5.0	6.0		5.0	6.0	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Act Effct Green (s)	20.9	20.9		20.9	20.9		11.1	79.8		7.0	70.9	
Actuated g/C Ratio	0.15	0.15		0.15	0.15		0.08	0.57		0.05	0.51	
v/c Ratio	0.75	0.21		0.03	0.06		0.70	0.84		0.30	0.81	
Control Delay	78.4	14.5		47.0	0.3		91.5	22.2		73.1	33.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	1.0		0.0	0.0	
Total Delay	78.4	14.5		47.0	0.3		91.5	23.2		73.1	33.4	
LOS	E	B		D	A		F	C		E	C	
Approach Delay		60.3			10.0			27.1			34.2	
Approach LOS		E			A			C			C	
Queue Length 50th (m)	43.6	1.0		1.5	0.0		31.0	132.7		7.7	175.2	
Queue Length 95th (m)	65.2	13.6		5.5	0.0		m41.7	168.6		18.4	207.7	
Internal Link Dist (m)		38.8			40.1			172.4			59.0	
Turn Bay Length (m)							30.0					
Base Capacity (vph)	285	380		282	446		154	1977		90	1723	
Starvation Cap Reductn	0	0		0	0		0	131		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.54	0.16		0.02	0.05		0.65	0.89		0.30	0.81	

Intersection Summary
Cycle Length: 140

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Growth Factor	
Heavy Vehicles (%)	
Bus Blockages (#/hr)	
Parking (#/hr)	
Mid-Block Traffic (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	12.0
Total Split (s)	12.0
Total Split (%)	9%
Yellow Time (s)	5.0
All-Red Time (s)	6.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	Max
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (m)	
Queue Length 95th (m)	
Internal Link Dist (m)	
Turn Bay Length (m)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

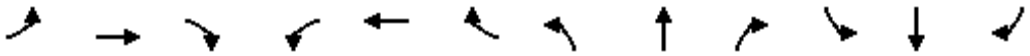
Intersection Summary

9: Hespeler Rd & Travelodge Access

Actuated Cycle Length: 140	
Offset: 22 (16%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.84	
Intersection Signal Delay: 32.0	Intersection LOS: C
Intersection Capacity Utilization 75.5%	ICU Level of Service D
Analysis Period (min) 15	

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 9: Hespeler Rd & Travelodge Access

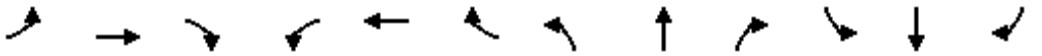


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	67	4	32	65	3	102	61	1594	46	76	1355	46
Confl. Peds. (#/hr)	4		5	5		4	2		2	2		2
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	0%	0%	0%	0%	0%	2%	5%	0%	0%	5%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	74	40	0	72	116	0	68	1822	0	84	1557	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Detector Phase	4	4		8	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		7.0	10.0		7.0	10.0	
Minimum Split (s)	33.0	33.0		33.0	33.0		12.0	25.0		12.0	25.0	
Total Split (s)	33.0	33.0		33.0	33.0		17.0	91.0		16.0	90.0	
Total Split (%)	23.6%	23.6%		23.6%	23.6%		12.1%	65.0%		11.4%	64.3%	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	4.0		3.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		5.0	6.0		5.0	6.0	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Act Effct Green (s)	14.3	14.3		14.3	14.3		10.8	96.9		11.9	100.3	
Actuated g/C Ratio	0.10	0.10		0.10	0.10		0.08	0.69		0.08	0.72	
v/c Ratio	0.71	0.20		0.51	0.44		0.50	0.77		0.55	0.63	
Control Delay	94.2	20.9		71.1	15.3		65.7	7.2		79.1	3.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.2		0.0	0.0	
Total Delay	94.2	20.9		71.1	15.3		65.7	7.4		79.1	3.2	
LOS	F	C		E	B		E	A		E	A	
Approach Delay		68.5			36.7			9.5			7.1	
Approach LOS		E			D			A			A	
Queue Length 50th (m)	21.3	1.1		20.3	0.8		20.4	53.0		25.7	19.5	
Queue Length 95th (m)	37.8	12.4		35.8	19.0		m24.4	m63.1		m34.5	30.1	
Internal Link Dist (m)		13.6			13.3			147.8			172.4	
Turn Bay Length (m)							30.0			30.0		
Base Capacity (vph)	196	340		265	398		159	2371		164	2453	
Starvation Cap Reductn	0	0		0	0		0	115		0	69	
Spillback Cap Reductn	0	0		0	2		0	73		0	77	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.38	0.12		0.27	0.29		0.43	0.81		0.51	0.66	

Intersection Summary
Cycle Length: 140

Actuated Cycle Length: 140
Offset: 19 (14%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.77
Intersection Signal Delay: 11.6 Intersection LOS: B
Intersection Capacity Utilization 77.8% ICU Level of Service D
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 10: Hespeler Rd & Party City Access

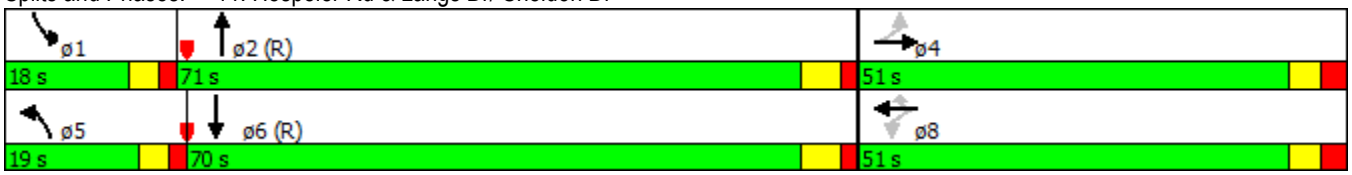


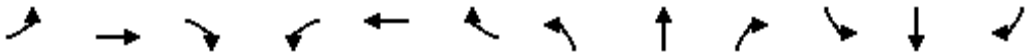
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	88	228	129	124	355	296	122	1294	141	135	1148	94
Confl. Peds. (#/hr)	12		5	5		12	11		16	16		11
Confl. Bikes (#/hr)												
Peak Hour Factor	0.84	0.84	0.84	0.87	0.87	0.87	0.92	0.92	0.92	0.88	0.88	0.88
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	1%	2%	4%	1%	2%	2%	2%	4%	1%	5%	2%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	105	425	0	143	408	340	133	1560	0	153	1412	0
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Detector Phase	4	4		8	8	8	5	2		1	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0	8.0	7.0	10.0		7.0	10.0	
Minimum Split (s)	38.3	38.3		38.3	38.3	38.3	12.0	30.0		12.0	30.0	
Total Split (s)	51.0	51.0		51.0	51.0	51.0	19.0	71.0		18.0	70.0	
Total Split (%)	36.4%	36.4%		36.4%	36.4%	36.4%	13.6%	50.7%		12.9%	50.0%	
Yellow Time (s)	3.3	3.3		3.3	3.3	3.3	3.0	4.0		3.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0	3.0	2.0	2.0		2.0	2.0	
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)	6.3	6.3		6.3	6.3	6.3	5.0	6.0		5.0	6.0	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Recall Mode	None	None		None	None	None	None	C-Max		None	C-Max	
Act Effct Green (s)	44.2	44.2		44.2	44.2	44.2	13.3	65.0		13.5	65.2	
Actuated g/C Ratio	0.32	0.32		0.32	0.32	0.32	0.10	0.46		0.10	0.47	
v/c Ratio	0.67	0.75		1.00	0.70	0.55	0.79	0.98		0.93	0.87	
Control Delay	64.4	50.5		122.3	49.2	19.4	101.1	34.2		119.8	24.5	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	2.1	
Total Delay	64.4	50.5		122.3	49.2	19.4	101.1	34.2		119.8	26.5	
LOS	E	D		F	D	B	F	C		F	C	
Approach Delay		53.3			49.6			39.5			35.7	
Approach LOS		D			D			D			D	
Queue Length 50th (m)	26.4	105.8		41.4	103.7	33.0	37.5	143.7		43.6	72.9	
Queue Length 95th (m)	#47.6	133.4		#83.6	136.0	60.6	#70.6	#282.9		#90.3	143.7	
Internal Link Dist (m)		203.6			142.8			428.9			147.8	
Turn Bay Length (m)	115.0			70.0		70.0	40.0			30.0		
Base Capacity (vph)	158	569		145	594	625	177	1587		165	1627	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	109	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.66	0.75		0.99	0.69	0.54	0.75	0.98		0.93	0.93	

Intersection Summary
Cycle Length: 140

Actuated Cycle Length: 140
Offset: 28 (20%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 115
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.00
Intersection Signal Delay: 41.7 Intersection LOS: D
Intersection Capacity Utilization 95.5% ICU Level of Service F
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 11: Hespeler Rd & Langs Dr/ Sheldon Dr





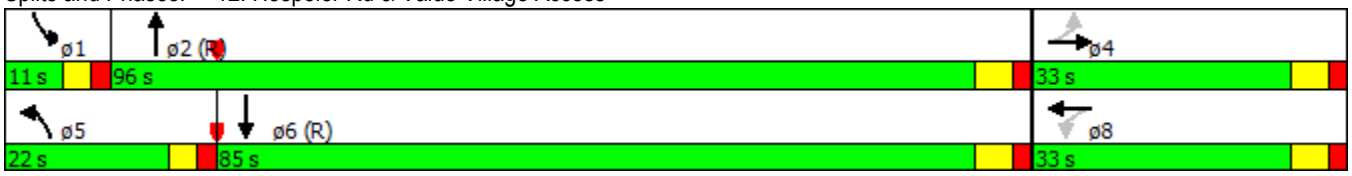
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	86	5	125	43	9	16	108	1470	35	30	1175	33
Confl. Peds. (#/hr)	7		2	2		7	3		2	2		3
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	1%	3%	0%	0%	3%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	96	145	0	48	28	0	120	1672	0	33	1343	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Detector Phase	4	4		8	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		5.0	10.0		5.0	10.0	
Minimum Split (s)	33.0	33.0		33.0	33.0		11.0	25.0		11.0	25.0	
Total Split (s)	33.0	33.0		33.0	33.0		22.0	96.0		11.0	85.0	
Total Split (%)	23.6%	23.6%		23.6%	23.6%		15.7%	68.6%		7.9%	60.7%	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	4.0		3.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		5.0	6.0		5.0	6.0	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Act Effct Green (s)	15.0	15.0		15.0	15.0		14.7	104.4		8.0	93.4	
Actuated g/C Ratio	0.11	0.11		0.11	0.11		0.10	0.75		0.06	0.67	
v/c Ratio	0.65	0.49		0.53	0.14		0.64	0.64		0.32	0.58	
Control Delay	78.8	15.3		78.9	29.8		76.0	4.1		48.4	21.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	78.8	15.3		78.9	29.8		76.0	4.1		48.4	21.4	
LOS	E	B		E	C		E	A		D	C	
Approach Delay		40.6			60.8			8.9			22.0	
Approach LOS		D			E			A			C	
Queue Length 50th (m)	27.3	1.6		13.5	2.7		36.5	36.1		8.8	122.0	
Queue Length 95th (m)	45.3	21.7		26.8	12.1		m39.2	m40.5		m10.8	m155.5	
Internal Link Dist (m)		34.5			40.9			319.4			428.9	
Turn Bay Length (m)							50.0			40.0		
Base Capacity (vph)	267	421		162	341		224	2607		105	2328	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.36	0.34		0.30	0.08		0.54	0.64		0.31	0.58	

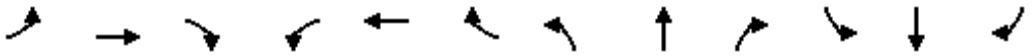
Intersection Summary
Cycle Length: 140

Actuated Cycle Length: 140	
Offset: 4 (3%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.65	
Intersection Signal Delay: 17.4	Intersection LOS: B
Intersection Capacity Utilization 81.7%	ICU Level of Service D
Analysis Period (min) 15	

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 12: Hespeler Rd & Value Village Access



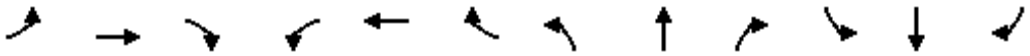


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	190	353	223	126	380	204	202	1190	89	202	1137	174
Confl. Peds. (#/hr)	10		16	16		10	16		29	29		16
Confl. Bikes (#/hr)												
Peak Hour Factor	0.91	0.91	0.91	0.85	0.85	0.85	0.91	0.91	0.91	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	1%	2%	7%	5%	3%	8%	4%	12%	1%	2%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	209	388	245	148	447	240	222	1406	0	217	1410	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8						
Detector Phase	7	4	4	3	8	8	5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	8.0	8.0	5.0	8.0	8.0	7.0	10.0		7.0	10.0	
Minimum Split (s)	9.0	40.0	40.0	9.0	40.0	40.0	12.0	30.0		12.0	30.0	
Total Split (s)	15.0	42.0	42.0	13.0	40.0	40.0	23.0	63.0		22.0	62.0	
Total Split (%)	10.7%	30.0%	30.0%	9.3%	28.6%	28.6%	16.4%	45.0%		15.7%	44.3%	
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0		3.0	4.0	
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	5.0	6.0		5.0	6.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	None	C-Max		None	C-Max	
Act Effct Green (s)	49.0	36.0	36.0	45.0	34.0	34.0	18.0	57.0		17.0	56.0	
Actuated g/C Ratio	0.35	0.26	0.26	0.32	0.24	0.24	0.13	0.41		0.12	0.40	
v/c Ratio	1.08	0.80	0.43	0.73	1.02	0.53	1.04	1.02		1.00	1.02	
Control Delay	122.4	62.5	7.2	54.4	99.4	29.2	133.2	64.3		116.5	62.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	122.4	62.5	7.2	54.4	99.4	29.2	133.2	64.3		116.5	62.2	
LOS	F	E	A	D	F	C	F	E		F	E	
Approach Delay		61.3			71.3			73.7			69.4	
Approach LOS		E			E			E			E	
Queue Length 50th (m)	~50.9	106.5	0.0	29.9	~137.4	32.8	~67.8	~173.8		~67.0	~227.9	
Queue Length 95th (m)	#104.9	#154.3	21.8	#47.5	#187.6	55.5	#125.2	#266.7		#121.3	#266.8	
Internal Link Dist (m)		194.9			176.1			237.1			319.4	
Turn Bay Length (m)	50.0		100.0	60.0		40.0	55.0			65.0		
Base Capacity (vph)	193	483	576	203	439	454	214	1385		216	1382	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	1.08	0.80	0.43	0.73	1.02	0.53	1.04	1.02		1.00	1.02	

Intersection Summary
Cycle Length: 140

Actuated Cycle Length: 140
Offset: 128 (91%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 145
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.08
Intersection Signal Delay: 69.7 Intersection LOS: E
Intersection Capacity Utilization 98.8% ICU Level of Service F
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 13: Hespeler Rd & Bishop St



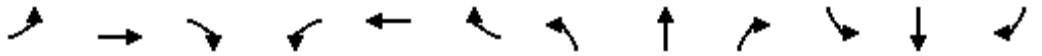
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	15	1	11	34	5	72	10	1118	62	101	1178	8
Confl. Peds. (#/hr)							2		1	1		2
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	0%	1%	0%	3%	0%	2%	3%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	17	13	0	38	86	0	11	1311	0	112	1318	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Detector Phase	4	4		8	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		4.0	10.0		7.0	10.0	
Minimum Split (s)	36.0	36.0		36.0	36.0		9.0	30.0		12.0	30.0	
Total Split (s)	36.0	36.0		36.0	36.0		9.0	81.0		23.0	95.0	
Total Split (%)	25.7%	25.7%		25.7%	25.7%		6.4%	57.9%		16.4%	67.9%	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	4.0		3.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		5.0	6.0		5.0	6.0	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes				Yes	
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Act Effct Green (s)	9.8	9.8		9.8	9.8		6.5	99.1		14.1	113.2	
Actuated g/C Ratio	0.07	0.07		0.07	0.07		0.05	0.71		0.10	0.81	
v/c Ratio	0.19	0.10		0.38	0.46		0.13	0.53		0.63	0.47	
Control Delay	65.5	30.0		72.8	22.5		58.4	3.8		60.0	2.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.1		0.0	0.1	
Total Delay	65.5	30.0		72.8	22.5		58.4	3.9		60.0	2.5	
LOS	E	C		E	C		E	A		E	A	
Approach Delay		50.1			37.9			4.3			7.0	
Approach LOS		D			D			A			A	
Queue Length 50th (m)	4.8	0.3		10.8	1.7		3.3	28.0		34.1	20.5	
Queue Length 95th (m)	12.8	7.4		22.8	18.8		m5.1	34.8		m37.1	m33.3	
Internal Link Dist (m)		16.7			46.1			170.1			237.1	
Turn Bay Length (m)							30.0			90.0		
Base Capacity (vph)	270	360		304	409		83	2465		231	2832	
Starvation Cap Reductn	0	0		0	0		0	291		0	394	
Spillback Cap Reductn	0	0		0	0		0	0		0	395	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.06	0.04		0.13	0.21		0.13	0.60		0.48	0.54	

Intersection Summary
Cycle Length: 140

Actuated Cycle Length: 140	
Offset: 124 (89%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.63	
Intersection Signal Delay: 7.6	Intersection LOS: A
Intersection Capacity Utilization 61.4%	ICU Level of Service B
Analysis Period (min) 15	

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 14: Hespeler Rd & Cambridge Centre

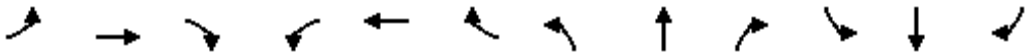


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	82	217	297	223	248	128	207	1186	128	160	1278	89
Confl. Peds. (#/hr)	9		2	2		9	6		2	2		6
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.86	0.86	0.86	0.99	0.99	0.99	0.88	0.88	0.88
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	1%	2%	1%	5%	1%	8%	1%	4%	8%	7%	2%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	89	236	323	259	288	149	209	1327	0	182	1553	0
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8						
Detector Phase	4	4	4	3	8	8	5	2		1	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0	8.0	7.0	8.0	8.0	7.0	10.0		7.0	10.0	
Minimum Split (s)	39.0	39.0	39.0	13.0	39.0	39.0	14.0	31.0		12.0	31.0	
Total Split (s)	39.0	39.0	39.0	16.0	55.0	55.0	21.0	64.0		21.0	64.0	
Total Split (%)	27.9%	27.9%	27.9%	11.4%	39.3%	39.3%	15.0%	45.7%		15.0%	45.7%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.0	4.0		3.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	5.0	6.0		5.0	6.0	
Lead/Lag	Lag	Lag	Lag	Lead			Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	None	C-Max		None	C-Max	
Act Effct Green (s)	23.3	23.3	23.3	39.3	39.3	39.3	22.5	63.4		20.3	61.2	
Actuated g/C Ratio	0.17	0.17	0.17	0.28	0.28	0.28	0.16	0.45		0.14	0.44	
v/c Ratio	0.49	0.76	0.72	1.20	0.55	0.32	0.73	0.86		0.75	1.01	
Control Delay	61.0	71.0	25.7	167.1	46.1	20.9	79.1	20.6		73.7	64.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	22.2	
Total Delay	61.0	71.0	25.7	167.1	46.1	20.9	79.1	20.6		73.7	86.2	
LOS	E	E	C	F	D	C	E	C		E	F	
Approach Delay		47.1			85.7			28.6			84.9	
Approach LOS		D			F			C			F	
Queue Length 50th (m)	23.9	66.6	26.7	~79.9	71.8	17.2	65.0	93.6		54.3	~253.4	
Queue Length 95th (m)	40.1	91.0	58.9	#116.9	88.9	31.5	m56.3	m47.5		#92.5	#290.4	
Internal Link Dist (m)		140.3			115.8			240.5			170.1	
Turn Bay Length (m)	50.0		50.0	100.0		20.0	75.0			80.0		
Base Capacity (vph)	256	439	543	215	658	558	287	1544		244	1532	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	30	
Spillback Cap Reductn	0	0	5	0	0	0	0	0		0	87	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.35	0.54	0.60	1.20	0.44	0.27	0.73	0.86		0.75	1.07	

Intersection Summary
Cycle Length: 140

Actuated Cycle Length: 140
Offset: 127 (91%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 140
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.20
Intersection Signal Delay: 61.0 Intersection LOS: E
Intersection Capacity Utilization 93.6% ICU Level of Service F
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 15: Hespeler Rd & Dunbar Rd

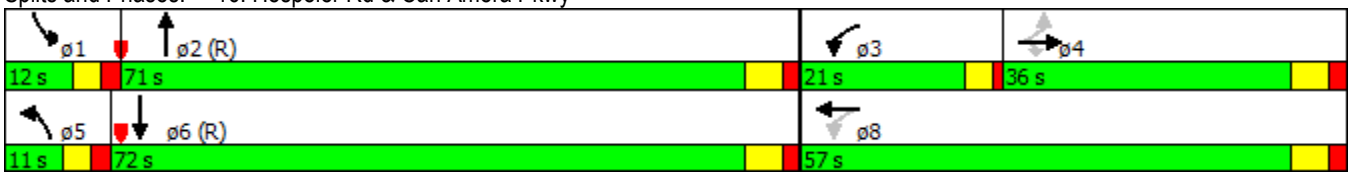


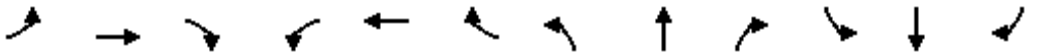
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	44	26	40	591	37	52	50	1547	319	105	1616	32
Confl. Peds. (#/hr)	5		7	7		5	4		5	5		4
Confl. Bikes (#/hr)												
Peak Hour Factor	0.76	0.76	0.76	0.88	0.88	0.88	0.88	0.88	0.88	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	1%	0%	7%	0%	4%	5%	0%	2%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	58	34	53	672	101	0	57	2120	0	117	1832	0
Turn Type	Perm	NA	Perm	pm+pt	NA		Prot	NA		Prot	NA	
Protected Phases		4		3	8		5	2		1	6	
Permitted Phases	4		4	8								
Detector Phase	4	4	4	3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	5.0	8.0		5.0	10.0		5.0	10.0	
Minimum Split (s)	36.0	36.0	36.0	12.0	36.0		11.0	31.0		11.0	31.0	
Total Split (s)	36.0	36.0	36.0	21.0	57.0		11.0	71.0		12.0	72.0	
Total Split (%)	25.7%	25.7%	25.7%	15.0%	40.7%		7.9%	50.7%		8.6%	51.4%	
Yellow Time (s)	4.0	4.0	4.0	3.0	4.0		3.0	4.0		3.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	1.0	2.0		2.0	2.0		2.0	2.0	
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)	6.0	6.0	6.0	4.0	6.0		5.0	6.0		5.0	6.0	
Lead/Lag	Lag	Lag	Lag	Lead			Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		None	C-Max		None	C-Max	
Act Effct Green (s)	12.4	12.4	12.4	32.2	30.2		10.3	73.2		19.6	84.8	
Actuated g/C Ratio	0.09	0.09	0.09	0.23	0.22		0.07	0.52		0.14	0.61	
v/c Ratio	0.50	0.20	0.23	2.07	0.25		0.43	1.20		0.46	0.86	
Control Delay	75.1	60.8	3.6	520.1	21.1		74.7	109.0		55.0	23.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.3	
Total Delay	75.1	60.8	3.6	520.1	21.1		74.7	109.0		55.0	24.1	
LOS	E	E	A	F	C		E	F		D	C	
Approach Delay		45.6			454.9			108.1			25.9	
Approach LOS		D			F			F			C	
Queue Length 50th (m)	16.5	9.4	0.0	~303.1	10.2		17.2	~388.5		34.4	138.7	
Queue Length 95th (m)	26.1	17.0	0.0	#357.7	24.3		m20.1	m#380.9		m35.8	m141.8	
Internal Link Dist (m)		16.2			159.9			360.5			240.5	
Turn Bay Length (m)							35.0			100.0		
Base Capacity (vph)	280	407	412	324	635		133	1769		252	2137	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	45	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.21	0.08	0.13	2.07	0.16		0.43	1.20		0.46	0.88	

Intersection Summary
Cycle Length: 140

Actuated Cycle Length: 140
Offset: 118 (84%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 2.07
Intersection Signal Delay: 127.7 Intersection LOS: F
Intersection Capacity Utilization 112.4% ICU Level of Service H
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 16: Hespeler Rd & Can Amera Pkwy



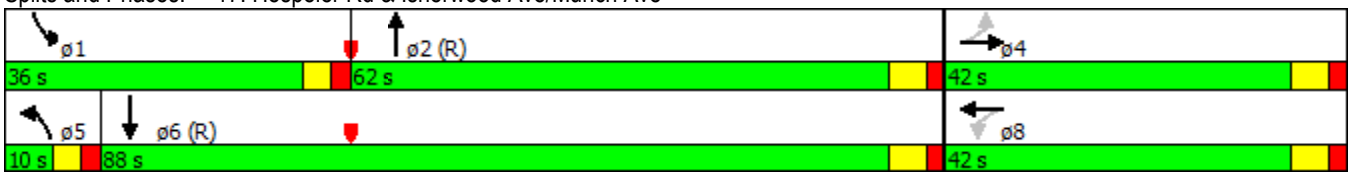


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	91	84	41	39	13	395	12	1426	83	417	1482	166
Confl. Peds. (#/hr)	3		2	2		3	3		11	11		3
Confl. Bikes (#/hr)												
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	1%	0%	4%	0%	20%	1%	0%	4%	0%	1%	3%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	91	125	0	39	408	0	12	1509	0	417	1648	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Detector Phase	4	4		8	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		5.0	10.0		5.0	10.0	
Minimum Split (s)	34.0	34.0		34.0	34.0		10.0	24.0		10.0	24.0	
Total Split (s)	42.0	42.0		42.0	42.0		10.0	62.0		36.0	88.0	
Total Split (%)	30.0%	30.0%		30.0%	30.0%		7.1%	44.3%		25.7%	62.9%	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	4.0		3.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		5.0	6.0		5.0	6.0	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Act Effct Green (s)	36.0	36.0		36.0	36.0		5.0	56.0		31.0	88.0	
Actuated g/C Ratio	0.26	0.26		0.26	0.26		0.04	0.40		0.22	0.63	
v/c Ratio	1.14	0.27		0.12	0.61		0.19	1.10		1.06	0.76	
Control Delay	189.2	37.5		41.4	11.9		93.9	85.5		76.4	25.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	189.2	37.5		41.4	11.9		93.9	85.5		76.4	25.5	
LOS	F	D		D	B		F	F		E	C	
Approach Delay		101.4			14.5			85.5			35.8	
Approach LOS		F			B			F			D	
Queue Length 50th (m)	~30.6	25.1		8.8	12.9		3.2	~267.7		~133.6	175.9	
Queue Length 95th (m)	#68.7	43.6		19.1	47.3		m3.8	m#304.0		m#130.7	m184.0	
Internal Link Dist (m)		27.2			68.8			266.1			360.5	
Turn Bay Length (m)				25.0			25.0			80.0		
Base Capacity (vph)	80	469		313	665		64	1378		395	2174	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	1.14	0.27		0.12	0.61		0.19	1.10		1.06	0.76	

Intersection Summary
Cycle Length: 140

Actuated Cycle Length: 140
Offset: 104 (74%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.14
Intersection Signal Delay: 54.7 Intersection LOS: D
Intersection Capacity Utilization 116.5% ICU Level of Service H
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 17: Hespeler Rd & Isherwood Ave/Munch Ave



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	11	6	10	158	5	99	9	1497	149	82	1817	11
Confl. Peds. (#/hr)	6		14	14		6	8		17	17		8
Confl. Bikes (#/hr)												
Peak Hour Factor	0.64	0.64	0.64	0.85	0.85	0.85	0.96	0.96	0.96	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	5%	1%	8%	3%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	17	25	0	186	122	0	9	1559	155	87	1933	12
Turn Type	Perm	NA		Perm	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6
Detector Phase	4	4		8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		4.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	41.0	41.0		41.0	41.0		9.5	25.0	25.0	10.0	25.0	25.0
Total Split (s)	41.0	41.0		41.0	41.0		9.5	74.0	74.0	13.0	77.5	77.5
Total Split (%)	29.3%	29.3%		29.3%	29.3%		6.8%	52.9%	52.9%	9.3%	55.4%	55.4%
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0		6.0	6.0		5.0	6.0	6.0	5.0	6.0	6.0
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes				Yes	Yes
Recall Mode	None	None		None	None		None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	24.1	24.1		24.1	24.1		4.5	68.0	68.0	8.0	79.1	79.1
Actuated g/C Ratio	0.17	0.17		0.17	0.17		0.03	0.49	0.49	0.06	0.56	0.56
v/c Ratio	0.09	0.08		0.78	0.35		0.16	0.93	0.20	0.92	0.98	0.01
Control Delay	46.2	24.6		76.7	16.8		72.0	45.3	4.0	128.0	41.3	0.0
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.2	24.6		76.7	16.8		72.0	45.3	4.0	128.0	41.3	0.0
LOS	D	C		E	B		E	D	A	F	D	A
Approach Delay		33.4			53.0			41.8			44.8	
Approach LOS		C			D			D			D	
Queue Length 50th (m)	4.2	2.2		52.5	7.2		2.6	220.3	1.0	24.5	299.4	0.0
Queue Length 95th (m)	7.6	6.2		70.3	21.2		9.1	#275.0	13.2	m#46.0	#381.4	m0.0
Internal Link Dist (m)		25.4			59.1			163.9			379.0	
Turn Bay Length (m)				40.0			30.0		50.0	30.0		30.0
Base Capacity (vph)	288	433		346	469		58	1669	786	95	1980	930
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.06		0.54	0.26		0.16	0.93	0.20	0.92	0.98	0.01

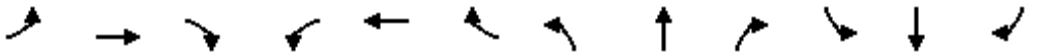
Intersection Summary
Cycle Length: 140

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Growth Factor	
Heavy Vehicles (%)	
Bus Blockages (#/hr)	
Parking (#/hr)	
Mid-Block Traffic (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	12.0
Total Split (s)	12.0
Total Split (%)	9%
Yellow Time (s)	5.0
All-Red Time (s)	6.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	Max
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (m)	
Queue Length 95th (m)	
Internal Link Dist (m)	
Turn Bay Length (m)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Actuated Cycle Length: 140
Offset: 15 (11%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.98
Intersection Signal Delay: 44.0 Intersection LOS: D
Intersection Capacity Utilization 85.6% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 18: Hespeler Rd & Jaffray St/Avenue Rd



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	96	143	48	71	207	62	69	127	61	63	146	146
Confl. Peds. (#/hr)	45		29	29		45	43		32	32		43
Confl. Bikes (#/hr)												
Peak Hour Factor	0.84	0.84	0.84	0.80	0.80	0.80	0.87	0.87	0.87	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	1%	6%	9%	0%	2%	4%	10%	8%	0%	5%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	114	227	0	89	337	0	79	216	0	70	324	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		2			6		3	8		7	4	
Permitted Phases	2			6								
Detector Phase	2	2		6	6		3	8		7	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		4.0	5.0		4.0	5.0	
Minimum Split (s)	25.0	25.0		25.0	25.0		9.0	27.0		9.0	27.0	
Total Split (s)	36.5	36.5		36.5	36.5		14.0	32.0		14.0	32.0	
Total Split (%)	40.6%	40.6%		40.6%	40.6%		15.6%	35.6%		15.6%	35.6%	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	4.0		3.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		5.0	6.0		5.0	6.0	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Recall Mode	Min	Min		Min	Min		None	None		None	None	
Act Effct Green (s)	18.0	18.0		18.0	18.0		8.2	19.6		8.0	16.8	
Actuated g/C Ratio	0.27	0.27		0.27	0.27		0.12	0.30		0.12	0.25	
v/c Ratio	0.61	0.46		0.34	0.68		0.37	0.44		0.32	0.72	
Control Delay	38.9	23.2		25.7	29.6		37.7	22.3		36.6	30.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	38.9	23.2		25.7	29.6		37.7	22.3		36.6	30.1	
LOS	D	C		C	C		D	C		D	C	
Approach Delay		28.5			28.8			26.4			31.2	
Approach LOS		C			C			C			C	
Queue Length 50th (m)	13.4	23.0		9.6	38.3		9.8	21.2		8.7	32.5	
Queue Length 95th (m)	31.3	43.9		21.2	63.0		26.9	46.2		25.3	70.8	
Internal Link Dist (m)		51.5			56.6			26.2			35.7	
Turn Bay Length (m)	20.0			20.0						20.0		
Base Capacity (vph)	347	892		484	902		259	707		269	727	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.33	0.25		0.18	0.37		0.31	0.31		0.26	0.45	

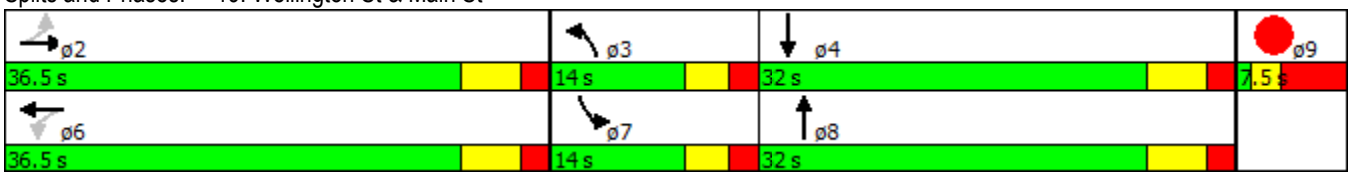
Intersection Summary
Cycle Length: 90

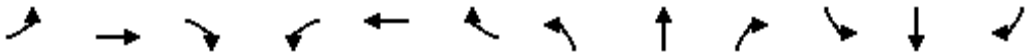
Lane Group	ø9
Lane Configurations	
Volume (vph)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Growth Factor	
Heavy Vehicles (%)	
Bus Blockages (#/hr)	
Parking (#/hr)	
Mid-Block Traffic (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	7.5
Total Split (s)	7.5
Total Split (%)	8%
Yellow Time (s)	2.0
All-Red Time (s)	4.5
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	Max
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (m)	
Queue Length 95th (m)	
Internal Link Dist (m)	
Turn Bay Length (m)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Actuated Cycle Length: 65.9	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.72	
Intersection Signal Delay: 28.9	Intersection LOS: C
Intersection Capacity Utilization 62.2%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 19: Wellington St & Main St





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	171	78	3	46	0	114	0	10	1	66	240	0
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	8%	0%	0%	0%	20%	0%	10%	0%	5%	0%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	280	0	0	178	0	0	12	0	73	267	0
Turn Type	Perm	NA		Perm	NA			NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8						6		
Detector Phase	4	4		8	8			2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0			5.0		5.0	5.0	
Minimum Split (s)	27.0	27.0		27.0	27.0			27.0		27.0	27.0	
Total Split (s)	44.0	44.0		44.0	44.0			38.5		38.5	38.5	
Total Split (%)	48.9%	48.9%		48.9%	48.9%			42.8%		42.8%	42.8%	
Yellow Time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0			2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0		0.0	0.0	
Total Lost Time (s)		6.0			6.0			6.0		6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None			Min		Min	Min	
Act Effct Green (s)		14.5			14.5			12.3		12.3	12.3	
Actuated g/C Ratio		0.31			0.31			0.26		0.26	0.26	
v/c Ratio		0.60			0.37			0.03		0.21	0.54	
Control Delay		20.1			7.5			13.7		16.1	20.1	
Queue Delay		0.0			0.0			0.0		0.0	0.0	
Total Delay		20.1			7.5			13.7		16.1	20.1	
LOS		C			A			B		B	C	
Approach Delay		20.1			7.5			13.7			19.2	
Approach LOS		C			A			B			B	
Queue Length 50th (m)		19.4			3.0			0.7		4.8	19.1	
Queue Length 95th (m)		44.5			15.4			4.0		14.9	44.3	
Internal Link Dist (m)		68.8			103.6			15.3			241.2	
Turn Bay Length (m)										25.0		
Base Capacity (vph)		1245			1075			1228		968	1355	
Starvation Cap Reductn		20			0			0		0	0	
Spillback Cap Reductn		0			0			0		0	0	
Storage Cap Reductn		0			0			0		0	0	
Reduced v/c Ratio		0.23			0.17			0.01		0.08	0.20	

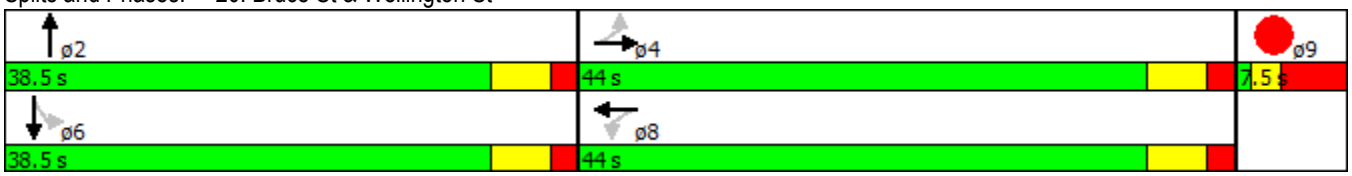
Intersection Summary
Cycle Length: 90

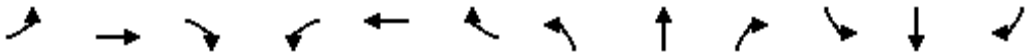
Lane Group	ø9
Lane Configurations	
Volume (vph)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Growth Factor	
Heavy Vehicles (%)	
Bus Blockages (#/hr)	
Parking (#/hr)	
Mid-Block Traffic (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	7.5
Total Split (s)	7.5
Total Split (%)	8%
Yellow Time (s)	2.0
All-Red Time (s)	4.5
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	Max
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (m)	
Queue Length 95th (m)	
Internal Link Dist (m)	
Turn Bay Length (m)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Actuated Cycle Length: 46.9	
Natural Cycle: 65	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.60	
Intersection Signal Delay: 16.8	Intersection LOS: B
Intersection Capacity Utilization 43.1%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 20: Bruce St & Wellington St





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	60	0	0	0	0	0	567	104	28	526	60
Confl. Peds. (#/hr)	2		3	3		2	17		23	23		17
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	100%	0%	0%	0%	0%	0%	7%	0%	0%	4%	100%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	67	0	0	0	0	0	746	0	0	682	0
Turn Type		NA						NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases										6		
Detector Phase		4						2		6	6	
Switch Phase												
Minimum Initial (s)		5.0						5.0		5.0	5.0	
Minimum Split (s)		27.0						27.0		27.0	27.0	
Total Split (s)		27.0						63.0		63.0	63.0	
Total Split (%)		30.0%						70.0%		70.0%	70.0%	
Yellow Time (s)		4.0						4.0		4.0	4.0	
All-Red Time (s)		2.0						2.0		2.0	2.0	
Lost Time Adjust (s)		0.0						0.0			0.0	
Total Lost Time (s)		6.0						6.0			6.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		None						Min		Min	Min	
Act Effct Green (s)		10.8						46.0			46.0	
Actuated g/C Ratio		0.19						0.79			0.79	
v/c Ratio		0.38						0.54			0.55	
Control Delay		33.0						7.9			8.4	
Queue Delay		0.0						0.0			0.0	
Total Delay		33.0						7.9			8.4	
LOS		C						A			A	
Approach Delay		33.0						7.9			8.4	
Approach LOS		C						A			A	
Queue Length 50th (m)		7.5						45.4			42.5	
Queue Length 95th (m)		22.2						103.5			99.8	
Internal Link Dist (m)		95.9			68.8			21.8			90.7	
Turn Bay Length (m)												
Base Capacity (vph)		396						1519			1372	
Starvation Cap Reductn		0						0			0	
Spillback Cap Reductn		0						0			0	
Storage Cap Reductn		0						0			0	
Reduced v/c Ratio		0.17						0.49			0.50	

Intersection Summary
Cycle Length: 90

Actuated Cycle Length: 58.2	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.55	
Intersection Signal Delay: 9.3	Intersection LOS: A
Intersection Capacity Utilization 70.0%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 21: Bruce St & Ainslie St