





1354 Carling Avenue Community Transportation Study / Transportation Impact Study







1354 Carling Avenue

Community Transportation Study/ Transportation Impact Study

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Community Transportation Study/Transportation Impact Study

1. INTRODUCTION

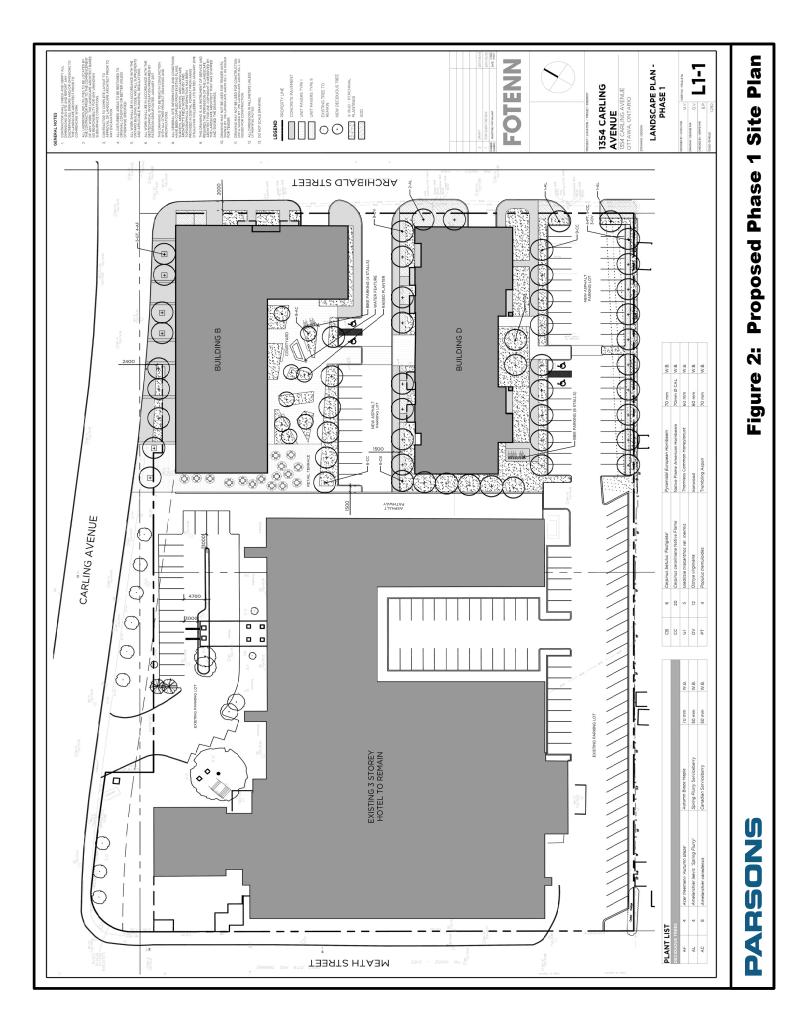
Holloway Lodging is proposing a new residential development consisting of four buildings on the properties municipally known as 1376 and 1354 Carling Avenue. Two buildings (Buildings A and B) front Carling Avenue and are both proposed with 20 storeys and two 9 storey buildings (Buildings C and D) are proposed further south on the site. The total number of residential units is 914 within the four buildings. Approximately 2,440 m² (26,200 ft²) of commercial is proposed fronting Carling Avenue as part of Buildings A and B.

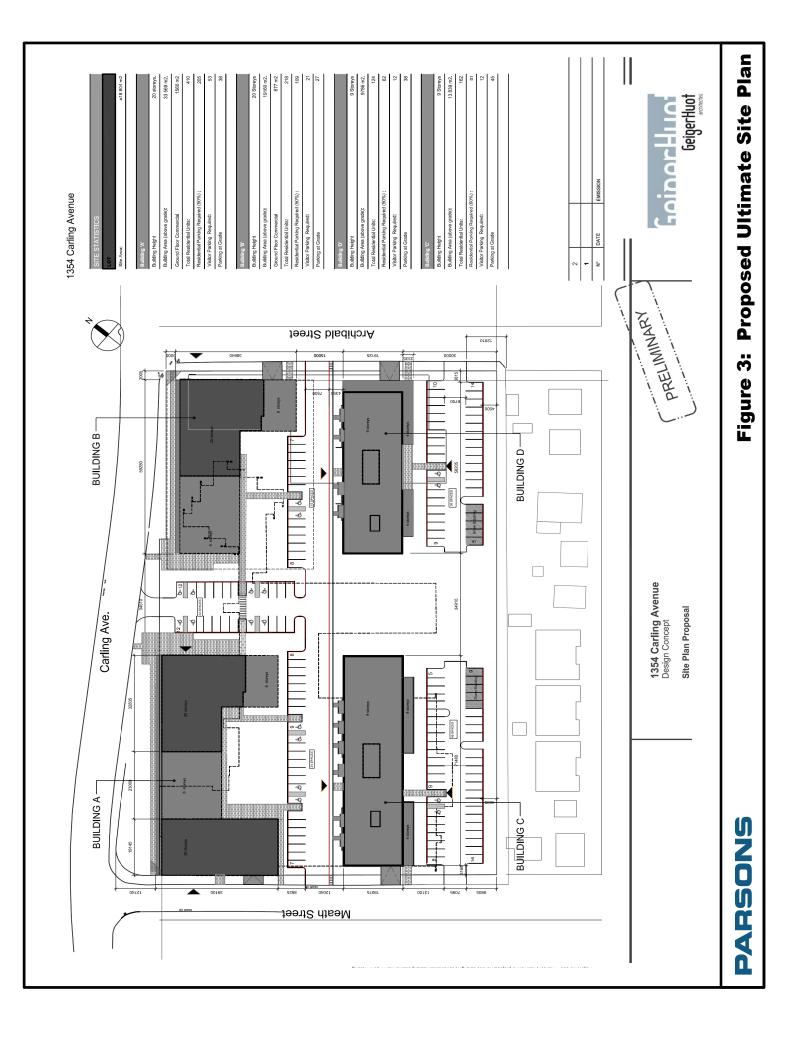
The site is currently occupied by a hotel (Travelodge) and parking structure with multiple (3) driveway connections to Carling Avenue and to a private road at the south end of the site. Access to the future development is proposed via one right-in/right-out driveway to Carling Avenue, four full-movement driveways to Meath Street and four full-movement driveways to Archibald Street (underground and surface parking lot accesses). Within the vicinity of HWY 417, the east and westbound sections of Carling Avenue are divided. As such, all access to/from Carling Avenue at this location will operate as right-in/right-out in the eastbound direction. The local context of the site is provided as Figure 1 and the proposed Phase 1 Site Plan and Ultimate Site Plan are provided as Figures 2 and 3, respectively.



Figure 1: Local Context

The site is planned to be developed in two phases. The first phase will consist of Building 'B' and Building 'D' (identified on the Site Plan) and the existing hotel will remain. The Ultimate Phase will include all four buildings and the removal of the existing hotel. For the purpose of this assessment, horizon years will be analyzed for the year 2019 representing full occupancy of Phase 1, and at the year 2024, representing ultimate build out. The study area will consist of the signalized and unsignalized intersections of Carling EB/Kirkwood South, Carling WB/Kirkwood North, Carling/Westgate Shopping Centre, Carling/Merivale, and the unsignalized Merivale/Thames.





As part of the rezoning and Site Plan Application processes, the City of Ottawa requires a submission of a formal Transportation Impact Assessment (TIA) consistent with their guidelines dated October 2006. With respect to these guidelines and for a rezoning/Site Plan application, a Community Transportation Study (CTS)/Transportation Impact Study (TIS) is considered the appropriate type of study. As such, a combined CTS/TIS is provided in support of the proposed development.

2. EXISTING CONDITIONS

2.1. AREA ROAD NETWORK

Carling Avenue is an east-west arterial roadway with a six-lane cross-section and a 44.5 m right-of-way (ROW) within the study area. It extends from March Road in the west and Bronson Avenue in the east. Within the study area, the unposted speed limit is understood to be 50 km/h.

Merivale Road is a north-south arterial roadway with a two-lane cross-section and a 30 m ROW within the study area. It extends from Island Park Drive in the north and Prince of Wales Drive in the south. Within the study area, the posted speed limit is 50 km/h.

Kirkwood Avenue is a north-south arterial roadway with a four-lane cross-section within the study area. It extends from Wilber Avenue in the north and Merivale Road in the south. Within the study area, the posted speed limit is 50 km/h.

Meath Street and Archibald Street are north-south local roadways with two-lane cross-sections and on-street parking permitted along the west side of the streets. Both roadways form 'T'-intersections with Carling Avenue, permitting northbound right and eastbound right turning movements only. A private roadway connects these roads directly south of the subject site. South of this private roadway, both Meath Street and Archibald Street operate as one-way roadways in the northbound direction. It is assumed that this restriction was put in place to prevent 'cut-through' traffic from Carling Avenue to Merivale Road, via Thames Street. The unposted speed limit along these roadways is understood to be 50 km/h.

Thames Street is an east-west local roadway with a two-lane cross-section and on-street parking permitted along the south side of the roadway. Thames Street forms a 'T'-intersection with Merivale Road and is cul-de-sac at the west end. The unposted speed limit is understood to be 50 km/h.

Highway 417 is an east-west Provincial Freeway with a six-lane cross-section within the study area. This highway is part of the Trans-Canada Highway and extends beyond the borders of Ottawa in both the west and east ends. The posted speed limit is 100 km/h. Access/egress to/from HWY 417 is provided via multiple on/off ramps on Carling Avenue within the vicinity of the Carling/Kirkwood intersections.

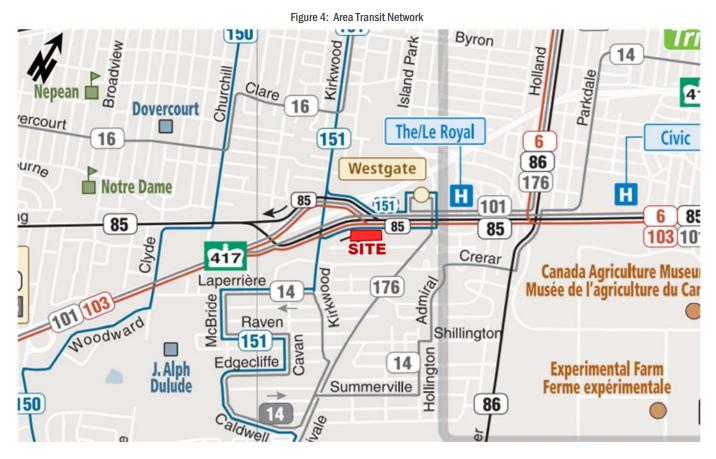
2.2. PEDESTRIAN/CYCLING NETWORK

Sidewalk facilities in the vicinity of the site are provided along both sides of Carling Avenue, Kirkwood Avenue, and Merivale Road. No sidewalks are provided along the local roadways Archibald Street, Meath Street and Thames Street. Dedicated bicycle facilities are currently provided in the form of bike lanes in both directions along Carling Avenue (west of Merivale Road) and along Merivale Road (north of Carling Avenue). Kirkwood Avenue is identified as a 'suggested route'.

According to the City's Cycling Plan, Merivale Road and Carling Avenue are classified as "Spine Routes" and Kirkwood Avenue is classified as a "Local Route".

2.3. TRANSIT NETWORK

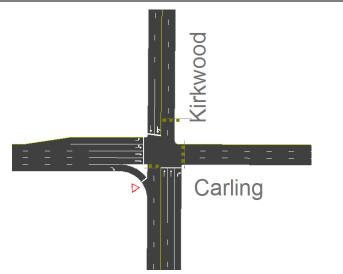
Transit service within the vicinity of the site is currently provided by OC Transpo Routes #85, 101, 103, and 151. Regular/Local Routes #85, 101, 151 provide frequent all-day service and Peak Hour Route #103 provides service during the weekday peak hours only. Bus stops for all routes are located along Carling Avenue within 150 m walking distance from the proposed development.



2.4. EXISTING STUDY AREA INTERSECTIONS

Carling EB/Kirkwood South

The Carling EB/Kirkwood S intersection is a signalized four-legged intersection. The eastbound approach consists of a single channelized right-turn lane, two through lanes, a shared through/left-turn lane and a left-turn lane. The southbound approach consists of a shared through/left-turn lane and a single through lane. The northbound approach consists of two through lanes and a single right-turn lane. At this location, the only restricted movement is the 'no right-turn on red' in the northbound direction. Also, Carling Avenue operates in the eastbound direction only at this location.



Merivale/Carling

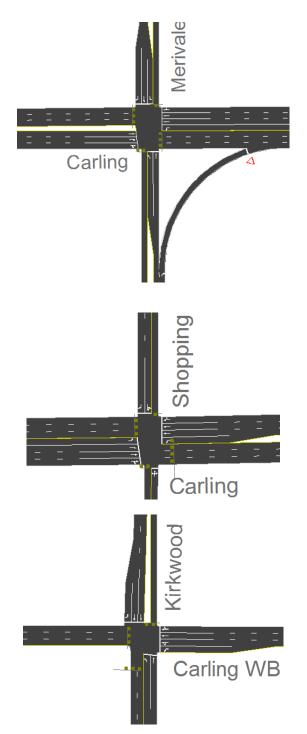
The Merivale/Carling intersection is a signalized fourlegged intersection. The westbound approach consists of a single left-turn lane, two through lanes and a shared through/right-turn lane. The eastbound approach consists a two through lanes and a shared through/right-turn lane. The southbound approach consists of a single left-turn lane, a single through lane and a single right-turn lane. The northbound approach consists of a single left-turn lane, a single through lane and a single channelized right-turn lane. At this location, the eastbound left-turn movement is prohibited and all other movements are permitted.

Carling/Westgate Shopping Centre

The Carling/Westgate Shopping Centre intersection is a signalized four-legged intersection. The east and westbound approaches both consist of a single left-turn lane, two through lanes and a shared through/right-turn lane. The southbound approach consists of a share through/left-turn lane and a single right-turn lane. The northbound approach consists of a single all-movement lane. At this location, there are no restricted or banned movements.

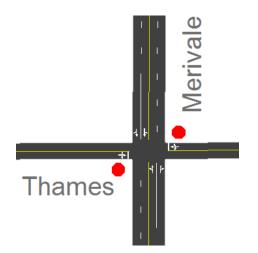
Carling WB/Kirkwood North

The Carling WB/Kirkwood N intersection is a signalized four-legged intersection. The westbound approach consists of a shared through/right-turn lane, a through lane, a shared through/left-turn lane and a left-turn lane. The southbound approach consists of a single right-turn lane and two through lanes. The northbound approach consists of a single through lane and a single left-turn lane. At this location, there are no restricted or banned movements; however, Carling Avenue operates in the westbound direction only.



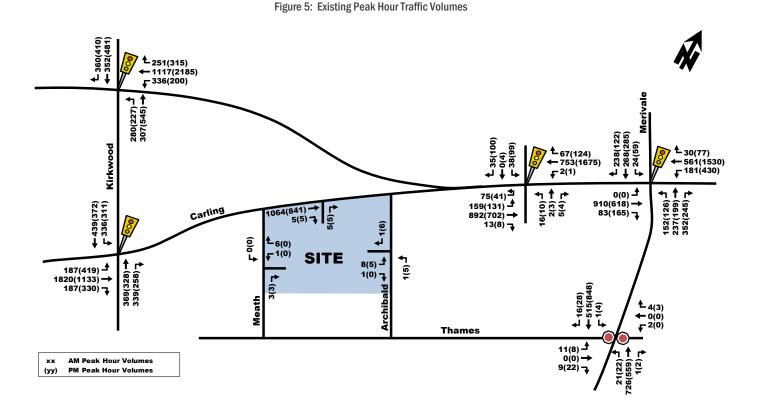
Merivale/Thames

The Merivale/Thames intersection is an unsignalized fourlegged intersection with STOP control on the minor approaches only. The north and southbound approaches consist of two through lanes, with turning movement permitted from the through lanes. The eastbound approach (Thames Street) consists of a single fullmovement lane. The westbound approach is a short residential loop off Merivale Road that consists of a single full movement lane.



2.5. EXISTING INTERSECTION OPERATIONS

Illustrated as Figure 5, are the most recent weekday morning and afternoon peak hour traffic volumes obtained from the City of Ottawa for the signalized Carling/Kirkwood N, Carling/Kirkwood S, Carling/Shopping Centre, and Carling/Merivale intersections. The unsignalized Merivale/Thames intersection and the Travelodge driveway were counted by Parsons in March 2017. It is noteworthy that the existing access to the parking structure from Carling Avenue was under construction at the time and as such the traffic volumes from the private driveway were counted (off of Archibald and Meath). In addition, the Merivale/Carling intersection count data dated August 2016 is noted as being lower than the October 2015 count, and as such, the higher 2015 count was used as a conservative method. Peak hour traffic volumes are included as Appendix A.



1354 Carling Avenue - Community Traffic Study/Transportation Impact Study

The following Table 1 provides a summary of existing traffic operations at study area intersections based on the SYNCHRO (V9) traffic analysis software. The subject intersections were assessed in terms of the volume-to-capacity (v/c) ratio and the corresponding Level of Service (LoS) for the critical movement(s). The subject intersections 'as a whole' were assessed based on a weighted v/c ratio. The unsignalized intersection was assessed in terms of delay and the corresponding Level of Service. The SYNCHRO model output of existing conditions is provided within Appendix B.

	Weekday AM Peak (PM Peak)					
Intersection		Critical Moven	nent	Intersec	ction 'as a	whole'
	LoS	max. v/c or avg. delay (s)	Movement	Delay (s)	LoS	v/c
Kirkwood S/Carling EB	E(D)	0.91(0.88)	EBT(NBR)	35.4(26.0)	E(B)	0.91(0.68)
Merivale/Carling	B(F)	0.70(1.01)	NBL(WBL)	25.4(32.0)	A(C)	0.59(0.71)
Kirkwood N/Carling WB	D(F)	0.85(1.13)	SBR(WBT)	28.5(74.6)	C(F)	0.72(1.12)
Carling/Westgate SC	A(B)	0.54(0.67)	EBT(EBL)	4.4(9.9)	A(B)	0.50(0.63)
Merivale/Thames	C(C)	18.5(18.9)	EBL(EBL)	0.6(0.6)	-	-
Note: Analysis of signalized interse	ections assu	mes a PHF of 0.95 and	a saturation flow rate	e of 1800 veh/h/lane.	•	•

Table 1:	Existing Performance	at Study Area	Intersections
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As shown in Table 1, the Merivale/Carling and Carling/Westgate Shopping Centre are currently operating overall at an acceptable LoS 'C' or better during morning and afternoon commuter peak hours. During the morning peak hour, the Kirkwood South/Carling EB intersection 'as a whole' is operating at capacity (LoS 'E') and during the afternoon peak hour, the Kirkwood North/Carling WB intersection 'as a whole' is operating above capacity (LoS 'F').

With regard to 'critical movements' at study area intersections, the eastbound through movement at the Kirkwood South/Carling EB intersection is currently operating at capacity (LoS 'E') during the morning peak hour. During the afternoon peak hour, the westbound through and westbound left-turn movements at the Kirkwood N/Carling WB and Merivale/Carling intersections are currently failing (LoS 'F'). All other 'critical movements' at study area intersections are currently operating at an acceptable LoS 'D' or better during peak hours with respect to the City's operating standard of LoS 'D' or better ($v/c \le 0.90$).

With regard to the unsignalized Merivale/Thames intersection, the SYNCHRO analysis indicates delays for side street traffic in the range of 16 to 18 seconds during morning and afternoon peak hours.

As mentioned previously, Archibald Street and Meath Street operate as one-way roadways in the northbound direction south of the site. Field observations noted one to two vehicles travelling southbound to Thames Street along both Archibald Street and Meath Street.

2.6. EXISTING ROAD SAFETY CONDITIONS

Collision history for study area roads (2013 to 2015, inclusive) was obtained from the City of Ottawa and most collisions (83%) involved only property damage, indicating low impact speeds, and 16% involved personal injuries. The remaining 1% were identified as "non-reportable", indicating the total damage to a vehicle was less than \$1,000.

The primary causes of collisions cited by police include; rear end (29%), turning movement (29%), sideswipe (25%), and angle (11%) type collisions.

A standard unit of measure for assessing collisions at an intersection is based on the number collisions per million entering vehicles (MEV). At intersections within the study area, reported collisions have historically taken place at a rate of:

• 1.35/MEV at the Carling/Kirkwood N intersection;

- 1.30/MEV at the Carling/Kirkwood S intersection; •
- 0.35/MEV at the Carling/Westgate Shopping Centre intersection; and •
- 0.97/MEV at the Carling/Merivale intersection. ٠

The Carling/Kirkwood N intersection has experienced high numbers of collisions in the past years. Changes are proposed at the Carling/Kirkwood N intersection with the removal of the HWY 417 eastbound on-ramp (outlined in Section 3.1). These modifications will help reduce the amount of traffic from the highway attempting to merge over multiple lanes to turn left onto Kirkwood Avenue.

At the Merivale/Thames intersection, 2 collisions were reported in a 3-year period and there were no reported collisions at the Carling/Meath and Carling/Archibald intersection between 2013 to 2015. It is noteworthy that in 2012 there was a fatal accident involving a cyclist and a passenger vehicle at the Carling/Archibald intersection. In addition, between 2011 and 2013 there were 5 reported collisions involving cyclists within the study area along Carling Avenue. As part of the City's Transit Priority project along Carling Avenue, on-street cycling lanes (and cycle tracks approaching Carling/Kirkwood North) are proposed along the curb lane between the sidewalk and the Transit Lane within the study area (west of Merivale Road).

With regard to the Carling/Westgate Shopping Centre intersection, there is a notable volume of westbound U-turning vehicles. Within the 3-years of provided collision data, there are no collisions involving U-turn movements, however, there are 5 collisions involving vehicles turning eastbound left (which could indicate they were making a U-turn). One possible mitigative measure to reduce chances of collisions involving U-turns is to not allow southbound right-turns-on-red for the Westgate Shopping Centre. The source collision data as provided by the City of Ottawa and related analysis is provided as Appendix C.

2.7. SCREENLINE OPERATIONS

The relevant screenlines within the vicinity of the proposed development are:

- SL 28 CPR Line •
 - Highway 417 station
- SL 27 CPR Line South
 - Carling Station

The City of Ottawa provided the most recent 2014 and 2016 Screenline count data, which is included as Appendix D. The existing performance of the relevant study area Screenline stations is summarized below in Table 2.

	Peak Directional Demand ¹ (PCU) ²		Directional	v/c	
Screenline Station	AM Peak Inbound	PM Peak Outbound	Capacity ³ (PCU)	AM Peak	PM Peak
CPR Line South (SL#29) Carling Station	1,109	1,736	1,800	0.62 (LoS 'B')	0.96 (LoS 'E')
CPR Line (SL #28) Highway 417 Station	5,657	6,308	5,400	1.05 (LoS 'F')	1.17 (LoS 'F')
 2014 volumes obtained from the C PCU (Passenger Car Units) were as 	,	autos and 2x heavy ve	hicles		

Table 2: Existing	Screenline	Station	Performance
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3. Directional capacities were obtained from IBI's Road Network Development Report and the 2008 Road Infrastructure Needs Study

As shown in Table 2, both Screenline stations at Carling and HWY417 are operating at or above capacity (LoS 'E' or 'F') in the afternoon peak hour in the outbound direction (westbound). During the morning peak hour, SL #28 HWY 417 Station is operating above capacity (v/c > 1.0) and the Carling Station is operating at an acceptable LoS 'B'.

It is noteworthy that for SL #28, the assumed capacity of the station located at the HWY 417, between the Rochester and Parkdale interchanges, is consider low for a four-lane freeway facility. Given existing volumes exceed the assumed capacity, and given the assumed capacity is considered low, the performance of SL #28 is likely better than a v/c of 1.05 to 1.17. However, based on observations, it is reasonable to assume that SL #28 is operating close to or at capacity (v/c = 0.9 to 1.0). It should be noted that the implementation of the east-west Light Rail Transit (LRT) will provide additional person capacity and mitigate the existing capacity constraints across this screenline. In addition, the planned transit priority along Carling Avenue will increase person capacity along this corridor, although it will also reduce the automobile capacity (lane reductions).

3. DEMAND FORECASTING

3.1. PLANNED STUDY AREA TRANSPORTATION NETWORK CHANGES

Within the City's 2013 TMP and identified on the 2031 Affordable Network Plan, there are no plans to increase the existing auto capacity within the vicinity of the site on City roadways. HWY 417 between Maitland Avenue and Carling Avenue is planned to be widened from 6 lanes to 8 lanes, starting Summer 2017. In terms of planned network improvements for transit, Carling Avenue is identified as a future Transit Priority corridor and Merivale Road is identified to receive isolated Transit Priority measures as shown in Figure 6.

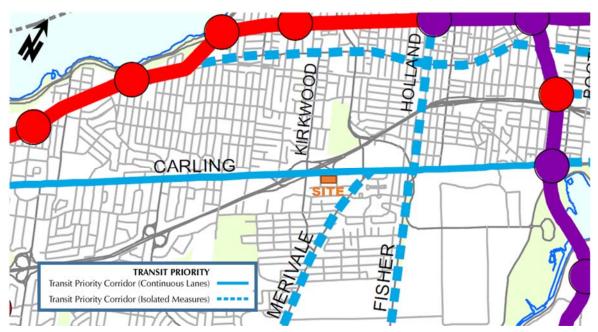


Figure 6: TMP Rapid Transit and Transit Priority – 2031 Affordable Network

Identified on the 2031 Network Concept Plan (planned network changes beyond the 2031 planning horizon year), further improvements to transit within the study area are planned. Carling Avenue is identified as a future Light Rail Transit (LRT) corridor with a station planned at the Merivale Road, and Merivale Road is identified as a future BRT corridor.

The MTO has indicated that as part of the planned widening of the highway from 6 lanes to 8 lanes between Maitland Avenue and Carling Avenue, the existing westbound Carling Avenue onramp to eastbound Highway 417 is planned to be closed. MTO has indicated that this is a relatively low-use ramp serving approximately 3,900 vehicles per day. The alternative route for these vehicles is to continue along Carling Avenue westbound, turn left at Kirkwood Avenue, and left onto Carling Avenue eastbound to the HWY 417 ramp. This route is shown in the following figure in green and the planned closed ramp is shown in red.

Figure 7: HWY 417 Eastbound On-Ramps



Given the projected increase in vehicle traffic at the Carling WB/Kirkwood N intersection, MTO along with the City of Ottawa, is proposing modifications to the Carling WB/Kirkwood N intersection to improve vehicle operations. There is an existing concern regarding vehicles exiting HWY 417 eastbound and 'weaving' across multiple lanes of traffic on Carling Avenue to turn left (heading southbound) on Kirkwood Avenue. To reduce the amount of 'weaving' vehicles, a concrete median is proposed separating the left-turn lanes from the through vehicles. This would prevent vehicles from HWY 417 turning left onto Kirkwood. Vehicles will instead turn left at the adjacent Carling/Saigon intersection.

Additional vehicle capacity in the form of a new westbound left-turn lane (double left-turn lanes) is proposed at the Carling WB/Kirkwood N intersection and additional left-turn lanes are proposed at both the Carling WB/Saigon and Carling EB/Saigon intersections. The Carling EB/Saigon intersection will also be signalized in the future. These proposed modifications are outlined in the following figure which is an excerpt of the MTO's presentation to the City of Ottawa Transportation Committee.

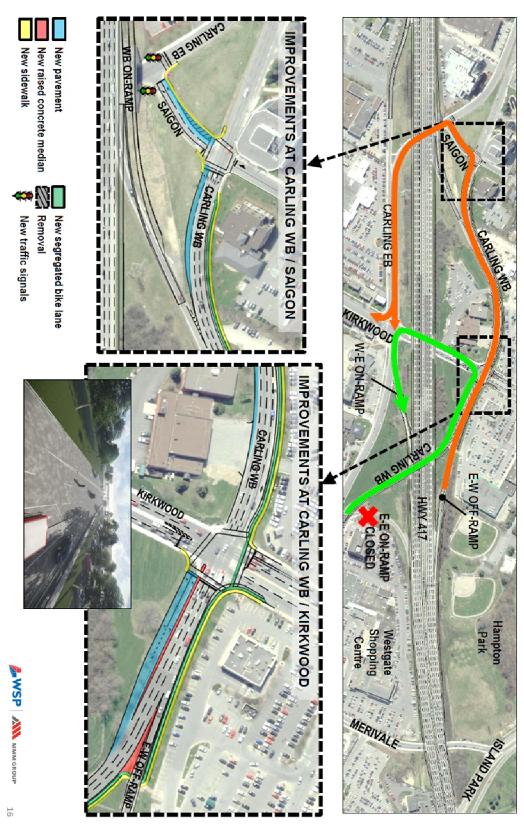


Figure 8: Proposed Modifications at the Carling/Kirkwood and Carling/Saigon Intersections¹

¹ Ministry of Transportation, WSP, MMM Group. (March 1, 2017). Proposed Highway 417 Carling Avenue E-E Ramp Closure [PDF]. Retrieved from http://app05.ottawa.ca/sirepub/cache/2/2i0wuzwgfmi1oodkghmkrmvz/43158603162017022838529.PDF

3.2. OTHER AREA DEVELOPMENT

With respect to other area development, the following development applications have been submitted to the City of Ottawa in the vicinity of the proposed site:

Westgate Shopping Centre - 1309 Carling

The Westgate Shopping Centre is located approximately 200 m northeast of the subject development and is planned to be redeveloped in four phases, with Phase 1 occupancy planned for 2017 and Phase 2 and 3 occupancy planned for 2022. Phase 1 of the Site Plan consists of 187 residential units and approximately 24,500 ft² of commercial and Phases 2 and 3 consist of an additional 1,183 residential units and 96,250 ft² of commercial. The Community Transportation Study (prepared by Parsons) projected an increase in two-way vehicle traffic of 95 to 120 veh/h during the weekday commuter peak hours for Phase 1 of the development and a 'net' increase in two-way vehicle traffic of 308 to 348 veh/h for Phase 2 and 3 (taking into account the partial removal of existing mall-generated traffic).

The projected traffic distribution from Phase1 of the development is included herein in the 2019 Horizon year, and the additional traffic generated by Phases 2 and 3 is included herein as part of the 2024 Horizon year as background traffic.

1335 Carling

1335 Carling Avenue, which is location approximately 75 m northeast of the subject development, is planned to be redeveloped on approximately the same timeline as the planned redevelopment of the Westgate Shopping Centre. The current proposal is to redevelop 1335 Carling Avenue to consist of an 11-storey office/commercial tower, totaling approximately 180,000 ft². The current site consists of a 6-storey building, totaling approximately 72,000 ft² of office/commercial. The Westgate Shopping Centre Redevelopment CTS outlines projected increases in traffic volumes for this development to be in the range of 100 veh/h and 80 veh/h during the weekday morning and afternoon peak hours, respectively.

The projected traffic distribution from this planned development is included herein in the 2019 Horizon year background traffic.

1400 Carling Avenue

The above-noted address is located directly adjacent to the west of the subject development. A requested has been submitted to increase the existing retirement home from 10 storeys to 13 storeys. No Traffic Impact Study was prepared for this application.

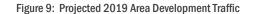
900 Merivale Road

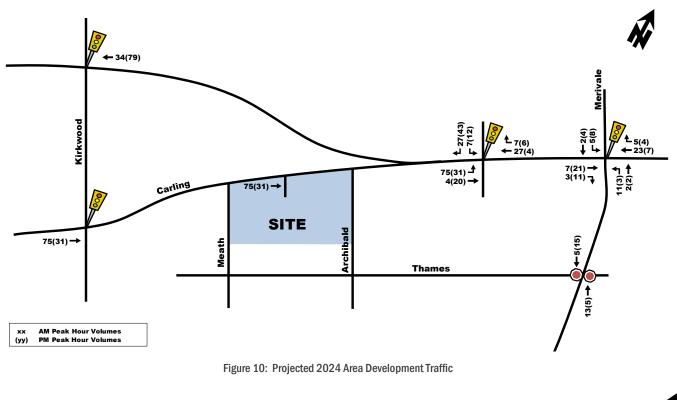
An expansion of the existing Community Health Centre is planned at the above-noted location, which is located approximately 250 m southeast of the subject development. The Transportation Overview (prepared by Parsons) projects an increase in two-way vehicle traffic of 40 to 50 veh/h during the weekday commuter peak hours.

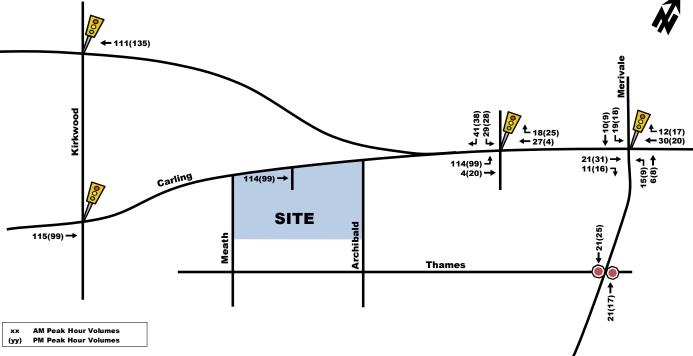
999 Merivale Road

A residential building consisting of 14 condominium units is planned at the above-noted address, which is located approximately 500 m southeast of the subject development. The Transportation Overview (prepared by Novatech) projects an increase in two-way vehicle traffic of approximately 10 veh/h during the weekday commuter peak hours.

The projected traffic generated by the Westgate Shopping Centre redevelopment and by the 1335 Carling development was added as background traffic to the study area intersections. These combined traffic volumes are illustrated as Figure 9 for the Horizon year 2019 and Figure 10 for the Horizon year 2024.







3.3. BACKGROUND TRAFFIC GROWTH

The following background traffic growth through the immediate study area (summarized in Table 3) was calculated based on historical traffic count data (years 2003, 2010, 2014, 2015, and 2016) provided by the City of Ottawa at the Merivale/Carling intersection. Detailed analysis is included as Appendix E.

Time & Danie d	Percent Annual Change					
Time Period	North Leg	South Leg	East Leg	West Leg	Overall	
8 hrs	-0.70%	-0.41%	0.48%	-0.34%	-0.12%	
AM Peak	-1.58%	-0.97%	-0.88%	-1.02%	-1.04%	
PM Peak	-1.69%	-0.84%	0.64%	-0.27%	-0.18%	

Table 3:	Merivale/Carling Historical	Background Growth
10010 0.		Buonground Growth

As show in Table 3, the Merivale/Carling intersection has experienced no overall growth (calculated as a weighted average) in recent years. Therefore, no additional background traffic growth was assumed for the subsequent analysis of future traffic operations.

3.4. BACKGROUND TRAFFIC INTERSECTION PERFORMANCE

Prior to any development of the proposed site, the following Table 4 provides a summary of background 2024 traffic operations at study area intersections based on the SYNCHRO (V9) traffic analysis software. The area development traffic volumes, outlined in Figure 10, were added onto existing traffic volumes to calculate baseline background traffic volumes (illustrated as Appendix F). The SYNCHRO model assumes existing intersection geometry and signal timing except at the Kirkwood N/Carling intersection were modifications are planned. The following analysis assumes a double westbound left-turn lane at the Kirkwood N/Carling intersection associated with the closure of the HWY 417 eastbound on-ramp. The detailed SYNCHRO model output of projected background conditions is provided within Appendix F.

	Weekday AM Peak (PM Peak)					
Intersection		'Critical Moveme	nt'	Intersection 'as a Whole'		
	LoS	max. v/c or avg. delay (s)	Movement	Delay (s)	LoS	v/c
Kirkwood S/Carling EB	E(D)	0.96(0.88)	EBT(NBR)	38.9(26.6)	E(B)	0.95(0.65)
Merivale/Carling	C(F)	0.76(1.06)	NBL(WBL)	28.8(34.5)	B(C)	0.62(0.74)
Kirkwood N/Carling WB	D(F)	0.86(1.11)	SBR(WBT)	28.0(65.6)	C(F)	0.72(1.10)
Carling/Westgate SC	D(D)	0.90(0.82)	EBT(EBT)	11.7(14.8)	D(C)	0.85(0.79)
Merivale/Thames	C(C)	19.2(19.6)	EBT(EBT)	0.6(0.6)	-	-
Note: Analysis of signalized in	tersections as	sumes a PHF of 0.95 an	d a saturation flow r	ate of 1800 veh/h/lar	ne.	

Table 4: Projected Background 2024 Performance at Study Area Intersections

As shown in Table 4, the signalized study area intersections 'as a whole' are projected to continue to operate at an acceptable LoS 'D' or better, with the exception of the Kirkwood S/Carling EB intersection during the morning peak hour and the adjacent Kirkwood N/Carling WB intersection during the afternoon peak hour, which are projected to operate at or above capacity (LoS 'E' and LoS 'F'). This is similar to the existing condition.

With regard to the 'critical movements', similar to existing conditions, the eastbound through movement at the Kirkwood S/Carling EB intersection during the morning peak hour is projected to continue to operate at capacity (LoS 'E') and the westbound through and westbound left-turn movements at the Kirkwood N/Carling WB and Merivale/Carling intersections are projected to operate above capacity (LoS 'F') during the afternoon peak hour. The critical movements at the

Carling/Westgate SC intersection have decreased from LoS 'A' and 'B' to LoS 'D' as there is an increase in the turning movements into and out of the Westgate Shopping Centre development.

These results are similar to the intersection capacity analysis noted in the Westgate Shopping Centre Redevelopment CTS. As noted in the Westgate CTS, minimal mitigation to improve intersection performance is feasible given the physical constraints at the intersections, specifically those in close proximity to HWY 417 (Kirkwood/Carling intersections). In terms of storage length for turn lanes, the east and westbound left-turn lanes along Carling Avenue are currently constructed with as much storage as possible given the adjacent intersections.

With regard to the eastbound left-turn movement at the Carling/Westgate Shopping Centre, the existing and background volumes at this location are significant. As mentioned previously, the existing traffic volumes are 130 to 160 left turning vehicles with an additional 40 to 75 vehicles performing a U-turn, totally approximately 170 to 235 veh/h in this left-turn lane. With the addition of the traffic generated by the adjacent developments, the total volume projected to be in this lane is approximately 270 to 350 veh/h during the morning and afternoon peak hours. As such, this movement is projected to operate at LoS 'D' with projected 95th percentile queues of approximately 100 to 150 m with existing signal timing. The existing storage length at this location is approximately 75 m and as such, the 95th percentile queue is projected to spill back out of the turn lane given the background conditions.

With regard to the eastbound U-turn movement along Carling Avenue, the Carling/Westgate Shopping Centre intersection is the only intersection that permits left-turns and U-turns within the vicinity of the site. U-turns and left-turns are permitted further east at the Civic Hospital driveways (unsignalized) and at the signalized Carling/Holland intersection (which is located 700 m east of the Carling/Westgate Shopping Centre intersection). Given Carling Avenue's configuration within the study area, there is a high demand for vehicles to perform a U-turn to head westbound on Carling Avenue towards the HWY 417 on-off ramps. This is represented by the 40 to 75 veh/h that perform this U-turn today.

3.5. SITE TRIP GENERATION

Appropriate trip generation rates for the proposed development consisting of approximately 914 residential units and 26,230 ft² of ground floor commercial (assumed to be retail) were obtained from the 9th Edition of the Institute of Transportation Engineers (ITE) Trip Generation Manual, which are summarized in Table 5.

Land Use	Data	Trip Rates		
Land Use	Source	AM Peak	PM Peak	
Condominiums	ITE 230	T = 0.44(du); In(T) = 0.80 In(du) + 0.26	T = 0.52(du); In(T) = 0.82 In(du) + 0.32	
Specialty Retail Centre	ITE 826	T = 1.36(X); T = 1.20(X) + 10.74	T = 2.71(X); T = 2.40(X) + 21.48	
Notes: T = Average Vehicl X = 1000 ft ² Gross du = dwelling units Specialty Retail AM F	Floor Area	l to be 50% of the PM Peak		

Table 5	ITF Trin	Generation	Rates
Table 5.	IIE IIIP	Generation	rates

As ITE trip generation surveys only record vehicle trips and typically reflect highly suburban locations (with little to no access by travel modes other than private automobiles), adjustment factors appropriate to the more urban study area context were applied to attain estimates of person trips for the proposed development. This approach is considered appropriate within the industry for urban infill developments.

To convert ITE vehicle trip rates to person trips, an auto occupancy factor and a non-auto trip factor were applied to the ITE vehicle trip rates. Our review of available literature suggests that a combined factor of approximately 1.3 is considered

reasonable to account for typical North American auto occupancy values of approximately 1.15 and combined transit and non-motorized modal shares of less than 10%.

For Phase 1 of the development, the existing hotel will remain and two of the buildings will be constructed on the east side of the site. As such, Phase 1 of the development will consist of approximately 342 residential units and 9,440 ft² of commercial. The person trip generation for the proposed Phase 1 of the development is summarized in Table 6.

Land Use	Aree	AM Pe	eak (Person T	rips/h)	PM Pe	eak (Person 1	rips/h)
	Area	In	Out	Total	In	Out	Total
Condominiums	342 du	30	150	180	143	71	214
Specialty Retail	9,440 ft ²	16	13	29	25	32	57
	Total Person Trips	46	163	209	168	103	271

Table 6:	Phase 1	Modified	Person	Trip	Generation
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modal shares of less than 10%

The person trips shown in Table 6 for the proposed site were then reduced by modal share values, including a reduction for 'pass-by' trips based on the site's location and proximity to adjacent communities, employment, other shopping uses and transit availability. Modal share and 'pass-by' values for condominiums and specialty retail uses within the proposed Phase 1 development are summarized in Tables 7 and 8, respectively, with the total Phase 1 site-generated vehicle traffic summarized in Table 9.

Table 7: Phase 1 Condominium Modal Site Trip Generation

Travel Mode	Mode	AM Peak (Person Trips/h)			PM Peak (Person Trips/h)			
	Share	In	Out	Total	In	Out	Total	
Auto Driver	50%	15	75	90	72	36	108	
Auto Passenger	10%	3	15	18	15	8	23	
Transit	25%	8	38	46	35	17	52	
Non-motorized	15%	4	22	26	21	10	31	
Total Person Trips	100%	30	150	180	143	71	214	
Total 'Nev	w' Auto Trips	15	75	90	72	36	108	

Table 8: Phase 1 Specialty Retail Modal Site Trip Generation

Travel Mode	Mode	AM Pe	ak (Person T	rips/h)	PM Peak (Person Trips/h)		
	Share	In	Out	Total	In	Out	Total
Auto Driver	50%	8	7	15	13	16	29
Auto Passenger	15%	3	2	5	4	5	9
Transit	15%	2	2	4	3	5	8
Non-motorized	20%	3	2	5	5	6	11
Total Person Trips	100%	16	13	29	25	32	57
Less Retail 25% Pass-By		-2	-2	-4	-4	-4	-8
Total 'New' Auto Trips		6	5	11	9	12	21

Land Use	AM Peak (veh/h)			PM Peak (veh/h)			
Land Use	In	Out	Total	In	Out	Total	
Condominiums	15	75	90	72	36	108	
Specialty Retail	8	7	15	13	16	29	
Retail Pass-By (30%)	-2	-2	-4	-4	-4	-8	
Total 'New' Auto Trips	21	80	101	81	48	129	

Table 9: Phase 1 Total Site Vehicle Trip Generation

As shown in Table 9, the resulting number of potential 'new' two-way vehicle trips for the proposed Phase 1 development is approximately 100 and 130 veh/h during the weekday morning and afternoon peak hours, respectively.

The ultimate development is planned to consist of four buildings with a total of 914 residential units and approximately 26,200 ft² of ground floor commercial, assumed to be ground floor retail for this study. In the ultimate scenario, the hotel will be demolished and as such, traffic generated from the hotel will be removed from the roadway network. As shown in Figure 5 – 'Existing Peak Hour Traffic Volumes', the total amount of vehicle traffic travelling to/from the hotel during the peak hours is approximately 30 veh/h. Following the same method outlined above, the total Phase 1 and 2 site-trip generation is summarized in Table 10 and detailed in Appendix G.

Land Use	AM Peak (veh/h)			PM Peak (veh/h)			
Lanu Use	In	Out	Total	In	Out	Total	
Condominiums	33	164	197	161	80	241	
Specialty Retail	15	13	28	24	31	55	
Retail Pass-By (30%)	-4	-4	-8	-7	-7	-14	
Total 'New' Auto Trips	44	173	217	178	104	282	
Less Existing Hotel Trips	-10	-21	-31	-19	-10	-29	
Total 'Net' New Auto Trips	34	152	186	159	94	253	

Table 10: Phase 1 and 2 Total Site Vehicle Trip Generation

As shown in Table 10, the resulting number of potential 'new' two-way vehicle trips for the proposed development is approximately 215 and 280 veh/h during the weekday morning and afternoon peak hours, respectively. With the removal of the existing vehicle trips to/from the hotel site, the net increase in vehicle traffic is projected to be 185 to 253 veh/h during the weekday morning and afternoon peak hours, respectively.

3.6. VEHICLE TRAFFIC DISTRIBUTION AND ASSIGNMENT

Traffic distribution was based existing volume splits at study area intersections and our knowledge of the surrounding area. As Carling Avenue operates as a one-way roadway at the site access and as the on/off ramps for HWY 417 are located to the west of the site, the distribution for vehicles leaving the site is assumed to be slightly different than the distribution for vehicles entering the site. For example, it is assumed that more eastbound vehicles, exiting the site, will elect to travel along Carling Avenue to their destination or to the next on-ramp to HWY 417 to avoid performing a U-turn along Carling Avenue. However, when arriving to the site, most drivers will exit the on/off ramps at Carling Avenue and continue eastbound on Carling to the site. The resultant distribution is outlined as follows:

From the Site

- 10% to eastbound HWY 417
- 20% to westbound HWY 417;
- 50% to the east via Carling Avenue;
- 5% to the west via Carling Avenue; and
- <u>15%</u> to the south via Merivale Road; 100%

To the Site

- 40% from eastbound HWY 417
- 20% from westbound HWY 417;
- 20% from the east via Carling Avenue;
- 10% from the west via Carling Avenue; and
- <u>10%</u> from the south via Merivale Road; 100%

Based on these distributions, 'new' and 'pass-by' site-generated trips were assigned to study area intersections, which are illustrated as Figure 11 for Phase 1 site-generated traffic and Figure 12 for Phase 1 and 2 site-generated traffic.

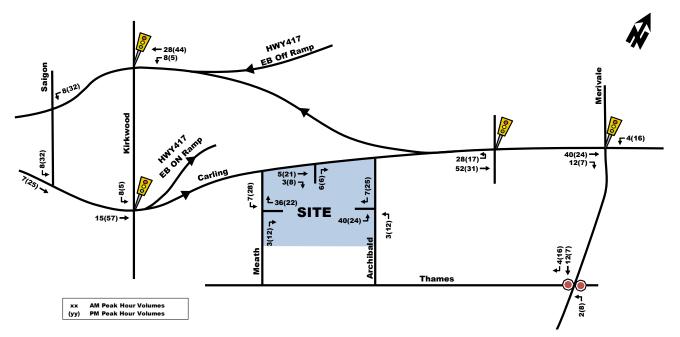
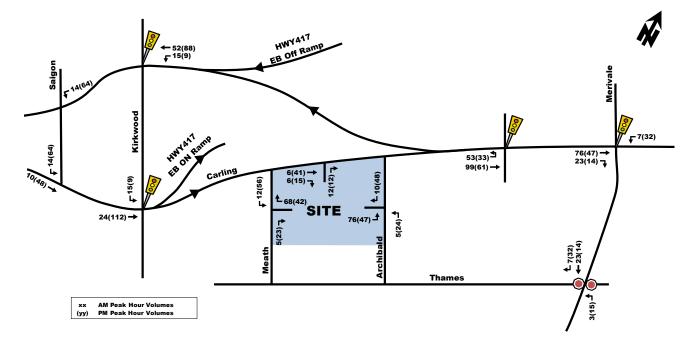


Figure 11: Phase 1 'New' and 'Pass-by' Site-Generated Traffic Volumes

Figure 12: Phase 1 and 2 'New' and 'Pass-by' Site-Generated Traffic Volumes



4. FUTURE TRAFFIC OPERATIONS

4.1. PROJECTED 2019 CONDITIONS AT PHASE 1 SITE DEVELOPMENT

The total projected 2019 volumes associated with the proposed development were derived by superimposing Phase 1 'new' and 'pass-by' site-generated traffic volumes (Figure 11) and 2019 area development traffic (Figure 9) onto existing traffic volumes (Figure 5). The resulting total projected 2019 volumes are illustrated as Figure 13.

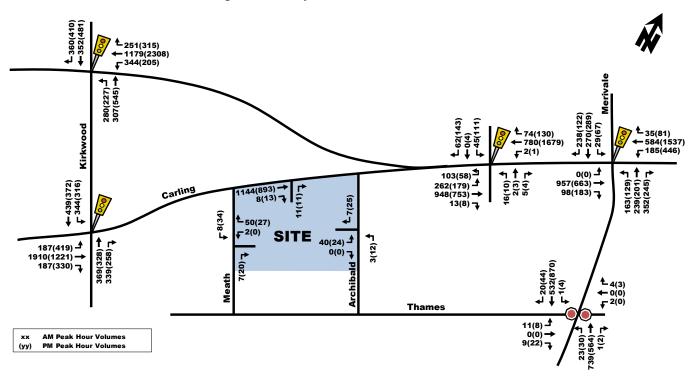


Figure 13: Total Projected 2019 Peak Hour Traffic Volumes

The Carling/Kirkwood N and Carling/Kirkwood S intersections will have significant changes to the turning movement volumes given the proposed plan to close the HWY 417 eastbound on-ramp. It is anticipated that there will be an increase in vehicle volume travelling through both intersections as Carling Avenue westbound vehicles destined for HWY 417 eastbound will travel through both Carling/Kirkwood intersections or find a different route. Given the relatively significant amount of unknown factors that would affect the traffic patterns within the study area, the existing traffic volumes were assumed as background traffic for the purpose of this study.

The following Table 11 provides a projected performance summary for study area intersections, based on total projected 2019 traffic volumes. The proposed modifications to the Carling/Kirkwood N intersection are included in there ensuing analysis. The detailed SYNCHRO model output of projected 2019 conditions is provided within Appendix H.

	Weekday AM Peak (PM Peak)							
Intersection		Critical Movem	ent	Intersection 'as a Whole'				
intersection	LoS	max. v/c or avg. delay (s)	Movement	Delay (s)	LoS	v/c		
Kirkwood S/Carling EB	E(D)	0.95(0.88)	EBT(NBR)	38.3(26.3)	E(B)	0.94(0.64)		
Merivale/Carling	C(F)	0.74(1.09)	NBL(WBL)	26.7(35.6)	B(C)	0.63(0.75)		
Kirkwood N/Carling WB	D(F)	0.85(1.11)	SBR(WBT)	27.7(69.6)	B(F)	0.70(1.10)		
Carling/Westgate SC	D(C)	0.88(0.80)	EBT(EBL)	7.6(12.5)	D(C)	0.84(0.77)		
Merivale/Thames	C(C)	19.2(20.1)	EBT(EBT)	0.6(0.7)	-	-		
Note: Analysis of signalized inte	rsections as	sumes a PHF of 0.95 and	d a saturation flow rat	e of 1800 veh/h/lane	2.	·		

Table 11: Projected 2019 Performance of Study Area Intersections

As shown in Table 11, the study area intersections are projected to operate 'as a whole' with acceptable levels of service LoS 'D' or better during the peak hours, with the exception of the Carling/Kirkwood intersections. This is similar to existing and background 2024 conditions.

With regard to the 'critical movements', the eastbound through movement at the Carling/Kirkwood S intersection is projected to continue to operate at capacity (LoS 'E') during the morning peak hour. During the afternoon peak hour, the westbound left-turn movement at the Carling/Merivale intersection and the westbound through movement at the Carling/Kirkwood N intersection are projected to operate above capacity (LoS 'F'), similar to existing conditions.

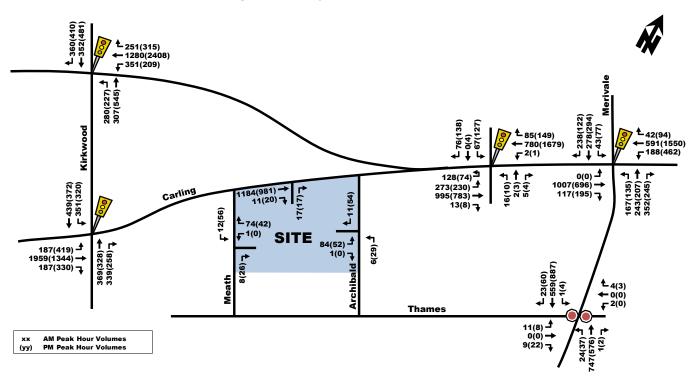
As mentioned in Section 3.4 Background Traffic Intersection Performance, the mitigative measures to improve performance at the study area intersections are relatively restricted given the current geometry. Signal timing adjustments can help improve some of the critical movements, however, most critical movements continue to operate in the range of LoS 'D' to LoS 'F'. The SYNCHRO model output of these changes is provided within Appendix I.

As mentioned previously, significant traffic pattern changes are anticipated with the removal of the HWY 417 eastbound on-ramp. In addition, the future transit priority corridor will help reduce the reliance on passenger automobiles, ultimately reducing the number of vehicles on the roadway. As such, and given the roadway geometry constraints, minimal mitigation is possible, and traffic volumes are expected to change and/or be reduced in the future with the planned network changes.

4.2. PROJECTED 2024 CONDITIONS AT FULL SITE BUILD-OUT

The total projected 2024 volumes associated with the proposed development were derived by superimposing Phase 1 and 2 'new' and 'pass-by' site-generated traffic volumes (Figure 12) and 2024 area development traffic (Figure 10) onto existing traffic volumes (Figure 5). The resulting total projected 2024 volumes are illustrated as Figure 14.

Figure 14: Total Projected 2024 Peak Hour Traffic Volumes



The following Table 12 provides a projected performance summary for study area intersections, based on total projected 2024 traffic volumes. The detailed SYNCHRO model output of projected 2024 conditions is provided within Appendix J.

		Weekday AM Peak (PM Peak)								
Intersection		Critical Movem	ent	Intersection 'as a Whole'						
	LoS	max. v/c or avg. delay (s)	Movement	Delay (s)	LoS	v/c				
Kirkwood S/Carling EB	E(D)	0.97(0.88)	EBT(NBR)	40.4(27.2)	E(B)	0.96(0.69)				
Merivale/Carling	C(F)	0.76(1.18)	NBL(WBL)	28.7(39.8)	B(C)	0.67(0.79)				
Kirkwood N/Carling WB	D(F)	0.86(1.15)	SBR(WBT)	26.2(75.2)	C(F)	0.74(1.14)				
Carling/Westgate SC	F(D)	1.04(0.82)	EBL(WBT)	14.5(20.7)	A(C)	0.48(0.76)				
Merivale/Thames	C(C)	20.1(21.2)	EBT(EBT)	0.6(0.8)	-	-				
Note: Analysis of signalized int	ersections as	ssumes a PHF of 0.95 and	d a saturation flow rat	e of 1800 veh/h/lane	2.					

Table 12: Projected 2024 Performance of Study Area Int	Itersections
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As shown in Table 12, the study area intersections are projected to operate 'as a whole' with acceptable levels of service LoS 'D' or better during the peak hours, with the exception of the Carling/Kirkwood intersections. This is similar to existing and background 2024 conditions.

With regard to the 'critical movements', the eastbound through movement at the Carling/Kirkwood S intersection is projected to continue to operate at capacity (LoS 'E') during the morning peak hour. During the afternoon peak hour, the westbound left-turn movement at the Carling/Merivale intersection and the westbound through movement at the Carling/Kirkwood N intersection are projected to operate above capacity (LoS 'F'). The eastbound left-turn movement at the Carling/Westgate Shopping Centre intersection is projected to operate above capacity (LoS 'F') during the morning peak hour.

As mentioned previously, signal timing adjustments can be made to improve the vehicle performance for certain movements. These modifications include:

- Optimized signal timing at all study area intersections;
- Provide protected/permitted eastbound left-turn phase at the Carling/Westgate Shopping Centre intersection; and
- Double westbound left-turn lanes at the Kirkwood N/Carling WB intersection as per the MTO and City's plans associated with the closure of the HWY 417 eastbound on-ramp.

Given these modifications, the resulting study area intersection performance is outlined in Table 13 and the SYNCHRO model output is provided at Appendix K.

	Weekday AM Peak (PM Peak)							
Intersection		Critical Movem	ent	Intersec	Intersection 'as a Whole'			
intersection	LoS	max. v/c or avg. delay (s)	Movement	Delay (s)	LoS	v/c		
Kirkwood S/Carling EB	D(D)	0.90(0.88)	EBT(NBR)	36.6(27.0)	D(B)	0.90(0.69)		
Merivale/Carling	C(E)	0.76(0.92)	NBL(WBL)	32.1(33.5)	B(C)	0.67(0.80)		
Kirkwood N/Carling WB	D(F)	0.85(1.06)	SBR(SBR)	29.2(57.4)	C(F)	0.74(1.03)		
Carling/Westgate SC	C(D)	0.77(0.81)	EBL(EBL)	13.6(20.4)	C(C)	0.74(0.78)		
Note: Analysis of signalized inte	rsections as	sumes a PHF of 0.95 and	d a saturation flow rat	e of 1800 veh/h/lane				

Table 13: Projected 2024 Performance of Study Area Intersections - Modified Signal Timing

As shown, with some adjustments to timing, most study area intersection are projected to operate with acceptable levels of service. The Kirkwood N/Carling WB intersection continues to operate above capacity during the afternoon peak hour.

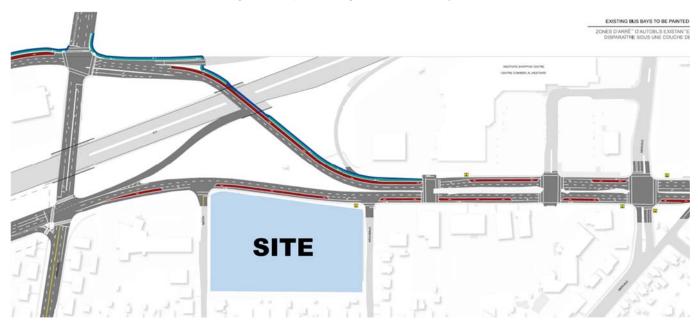
The total amount of vehicles that are projected to perform a U-turn at the Carling/Westgate Shopping Centre intersection ranges from 75 to 130 veh/h during the peak hours. As there is an existing protected/permitted left-turn phase at this location during the afternoon peak hour (and recommended during the morning peak hour), there is sufficient capacity for the left-turn and U-turn vehicles to operate at LoS 'D'. As mentioned previously, consideration could be given to restricting the southbound right-turn movement to 'no-right-on-red' to help prevent collisions associated with heavy U-turn traffic.

With regard to queues at the Carling/Westgate Shopping Centre intersection, the eastbound left-turn lane 95th percentile queue is projected to be approximately 85 to 115 m, which spills out past the provided 75 m storage lane. This is similar to Background 2024 traffic volume scenario as there is a significant amount of traffic using the left-turn lane for left-turn as well as U-turn movements. With the future modifications to Carling Avenue, both the closure of the HWY 417 eastbound on-ramp and the future transit priority lanes, significant changes to traffic conditions are anticipated within this network. With the closure of the eastbound on-ramp, drivers may elect to continue eastbound along Carling Avenue instead of performing the U-turn movement. In addition, with the implementation of transit priority, passenger vehicle traffic is likely to decrease given the more reliable transit service and the reduction of vehicle lane capacity on Carling Avenue.

4.2.1. CARLING AVENUE TRANSIT PRIORITY CONDITION

The City of Ottawa project to provide transit priority continuous lanes along Carling Avenue is identified in the 2013 TMP as part of the affordable network. The Open House for this project was held in February 2017 and illustrates the proposed plan along Carling Avenue. The following Figure 15 illustrates the plan for Carling Avenue within the vicinity of the site.

Figure 15: Proposed Carling Avenue Transit Priority Plan



As shown in the above figure, the proposed cross-section of Carling Avenue would consist of two vehicle travel lanes and a 'transit only' lane along the curb side. This will reduce passenger vehicle capacity along the corridor. The total projected 2024 traffic volume scenario was assessed with this new configuration and the results as summarized in Table 14. These results include the mitigative measures outlined above.

	Weekday AM Peak (PM Peak)							
Intersection		Critical Movem	ent	Intersection 'as a Whole'				
	LoS	max. v/c or avg. delay (s)	Movement	Delay (s)	LoS	v/c		
Kirkwood S/Carling EB	D(D)	0.90(0.88)	EBT(NBR)	36.5(27.6)	D(B)	0.90(0.69)		
Merivale/Carling	D(D)	0.83(0.90)	EBT(WBL)	49.9(55.4)	C(D)	0.79(0.85)		
Kirkwood N/Carling WB	D(F)	0.86(1.05)	SBR(WBT)	29.6(52.9)	C(F)	0.74(1.05)		
Carling/Westgate SC	C(F)	0.74(1.01)	EBL(WBT)	15.5(47.7)	A(E)	0.51(0.95)		
Note: Analysis of signalized inte	rsections as	sumes a PHF of 0.95 and	d a saturation flow rat	e of 1800 veh/h/lane		·		

Table 14: Projected 2024 Performance of Study Area Intersections - Reduced Carling Avenue Cross-Section

As shown in Table 17, the study area intersections 'as a whole' are projected to operate at an acceptable LoS 'D' or better during the peak hours, with the exception of the Kirkwood N/Carling WB and Carling/Westgate Shopping Centre intersection during the afternoon peak hour. With regard to the critical movements, the westbound through movements at the Kirkwood N/Carling WB and Carling/Westgate Shopping Centre intersections are projected to operate above capacity (LoS 'F') given the reduced vehicle travel lanes. All other critical movements are projected to operate with acceptable levels of service given the signal timing plan modifications outlined above.

It is noteworthy, providing a transit priority corridor along Carling Avenue will ultimately reduce the number of passenger vehicles on the roadway, as more people will be inclined to take transit with improved travel times. With a reduction of passenger vehicles, the levels of service for the study area intersection will improve.

4.3. NEIGHBOURHOOD IMPACTS

Based on the location of the proposed development and its connections to Carling Avenue (arterial road), there is minimal site-generated traffic projected to travel along local streets within the vicinity of the subject site. Given the one-way configuration of Archibald Street and Meath Street, site-generated traffic can use these streets to access the development, however, they are restricted from using Archibald Street and Meath Street to travel southbound to Thames Street to exit the site. Approximately 30% of inbound traffic to the site is projected to travel via Thames Street, Archibald Street and Meath Street, which equates to approximately 10 to 50 veh/h during peak hours for the ultimate condition. This amount of traffic represents less than 1 vehicle each minute on average and the total traffic travelling along Thames Street in the westbound direction is less than 100 veh/h during the afternoon peak hour, which is appropriate for a local roadway.

With respect to neighbourhood transit, the site is projected to generate an approximate total of 105 and 135 new two-way person transit trips during the weekday morning and afternoon peak hours, respectively, for the ultimate condition. This amount of person traffic can be easily accommodated by the proposed transit priority corridor.

5. TRANSPORTATION DEMAND MANAGEMENT

Depending on the nature of a development, Transportation Demand Management (TDM) strategies have the potential to be an integral part of a planned development in order to address and support the City's policies with regard to TDM. For this particular site, its proximity to the existing transit service is considered very advantageous in lessening the reliance on the private automobile. A number of other TDM measures could also be considered, including:

- Improving the quality and safety of pedestrian facilities, such as enhanced sidewalks/lighting;
- Provide quality and safe cycling facilities, such as storage facilities;
- Provide change area/shower facilities for any on-site employees;
- Providing transit information in common areas or/and enhance bus shelters to encourage transit use; and
- Provide appropriate car sharing programs/facilities to reduce auto ownership and attract residents who do not own a vehicle.

TDM strategies are important in encouraging active modes of transportation to/from the site, further lessening the reliance on the private automobile.

6. SITE PLAN REVIEW

This section provides an overview of site access, parking requirements, pedestrian circulation and transit accessibility. The proposed Phase 1 and Ultimate Site Plans were previously illustrated as Figures 2 and 3.

Parking

Parking is planned to be provided at grade with access to/from Carling Avenue, Archibald Street and Meath Street. In addition, underground parking is planned with access to/from Archibald Street and Meath Street. A total of 457 parking spaces are required for the residential units, 92 are required for the visitor parking and depending on the land use of the commercial parcels additional parking may be required. Currently the Ultimate Site Plan indicates a total of 148 surface level parking spaces and the parking garage plan indicates a total of 537 parking spaces, for a total of 685 parking spaces. This amount of parking meets the City's By-Law requirements for Area Y (Inner Urban Mainstreet) as identified on Schedule 1A. The surface parking space dimensions are noted as 5.4 m in length and 2.7 m in width, and the underground parking space dimensions are noted as 5.4 m in width, which satisfies the City's By-Law requirements.

Site Circulation

With regard to on-site circulation, the proposed parking lot is laid out effectively, such that two-way traffic can be efficiently accommodated. The proposed drive aisles are noted as 6.7 m in width, which meets the City's By-Law requirements. There

are four proposed ramps to/from the underground parking, which will minimize conflicts within the parking garage and on the ramps.

There are three separate surface level parking lots. The one serving the two buildings fronting Carling Avenue (Buildings A and B) has three driveway connections to public streets (one to Archibald, one to Carling and one to Meath). Each of the 9 storey buildings (Buildings C and D) have individual surface parking lots with one driveway connection to the local street. Providing multiple driveways to the parking garages and parking lots will minimize the amount of vehicles conflicts and reduce speeds on-site.

The ramp providing access to the lower level parking should be equal to or less than 2% grade for 9 m from the property line. Appropriate transitions grades should be provided at the top and bottom of the ramps.

Truck routes or loading areas are not identified on the proposed Site Plan; however, sufficient turning radii on-site and at the site driveway connections should be provided for fire, garbage and delivery truck circulation.

Access Requirements

Based on projected volumes and proximity to adjacent intersections, additional traffic control/auxiliary turn lanes are not warranted or required at the proposed driveway connections.

The proposed Site Plan has one driveway connection to Carling Avenue, 4 driveway connections to Meath Street and 4 driveway connections to Archibald Street. According to the Private Approach By-Law the maximum number of private approaches allowed on each frontage is 2 two-way private approaches. As such, the number of driveways on Meath Street and Archibald Street exceed the maximum allowed by the Private Approach By-Law. In addition, driveways to the same property should be distanced at least 9 m apart according to the Private Approach By-Law. All driveways meet this By-Law with the exception of the Building B accesses which has two driveways that are spaced approximately 7.5 m apart. This was done to maximize the distance of the driveways from the arterial roadway (Carling Avenue).

Given the Site Plan design, providing an underground parking access for each building will minimize on site vehicle conflicts and reduce speeds within the parking garage. In addition, as the surface parking lots are not all connected on site, and as each parking lot serves an individual building, providing an access to each parking lot is considered appropriate. In addition, the traffic volumes along Archibald Street and Meath Street were observed to be very low, in the range of 20 to 30 veh/h two-way, which equates to approximately 1 vehicle every 2 to 3 minutes. As such, off-site conflicts with vehicles exiting and entering the site are projected to be low. Based on the foregoing, the proposed amount of driveways is considered acceptable.

Pedestrians/Transit

To connect pedestrians to transit service and other nearby employment, shopping and recreation opportunities, sidewalks are provided along both sides of Carling Avenue, Merivale Road and Kirkwood Avenue. Pedestrian pathways are planned connecting the parking lots to/from the four proposed buildings and a pedestrian crossing is proposed crossing the drive aisle that connects to Carling Avenue.

Transit service within the vicinity of the site is currently provided by OC Transpo Routes #85, 101, 103, and 151. Regular/Local Routes #85, 101, 151 provide frequent all-day service and Peak Hour Route #103 provides service during the weekday peak hours only. Bus stops for all routes are located along Carling Avenue within 150 m walking distance from the proposed development. Carling Avenue is planned to have transit priority lanes adjacent to the site in the future.

Bicycles

A total of 458 underground bicycle parking spaces are proposed to serve the development, which is sufficient with respect to the City's By-Law requirements for the proposed site. Surface bicycle parking, located in well-lit areas, close to main building entrances, should also be provided for the commercial portion of the site.

7. FINDINGS AND RECOMMENDATIONS

Based on the foregoing analysis of the proposed development, the following transportation-related conclusions are offered:

EXISTING CONDITIONS

- The study area intersections adjacent to the site are currently operating 'as a whole' with an overall LoS 'D' or better during the weekday morning and afternoon peak hours, with the exception on the Carling/Kirkwood North and South intersections;
- With regard to 'critical movements' at study area intersections, the eastbound through movement at the Kirkwood South/Carling EB intersection is currently operating at capacity (LoS 'E') during the morning peak hour. During the afternoon peak hour, the westbound through and westbound left-turn movements at the Kirkwood N/Carling WB and Merivale/Carling intersections are currently failing (LoS 'F'). All other movements are operating at acceptable LoS 'D' or better during peak hours;
- Based on the available collision data, Carling/Kirkwood N intersection has experienced high numbers of collisions in the past years. Changes are proposed at the Carling/Kirkwood N intersection with the removal of the HWY 417 eastbound on-ramp to help mitigate issues with weaving vehicles;
- Between the year 2011 to 2013 there were several collisions involving cyclists along Carling Avenue;

PROJECTED CONDITIONS

- Based on historic counts at the Carling/Merivale intersection, the study area has experiences no overall growth in recent years;
- There are several proposed developments within the study area, and traffic from the major developments (Westgate Shopping Centre redevelopment and 1335 Carling Avenue) has been accounted for the in the background traffic volumes;
- Carling Avenue is planned to have transit priority lanes in both directions, which will reduce the number of passenger vehicle lanes along Carling Avenue form 6-lanes to 4-lanes;
- The MTO has plans to close the HWY 417 eastbound on-ramp along Carling Avenue as part of the HWY 417 widening. Modifications to the Carling/Kirkwood N intersection are planned to mitigate future traffic pattern changes;
- The proposed development is projected to generate 'new' two-way vehicle volumes of approximately 100 and 130 veh/h during the weekday morning and afternoon peak hours, respectively for Phase 1 of the development and 185 to 253 veh/h for the ultimate development;
- At Phase 1 site occupancy (year 2019), study area intersections continue to operate with some capacity constraints for certain movements. Mitigation in the form of signal timing adjustments is recommended as there are minimal possible geometric improvements given the existing geometry. Signal timing adjustments results in most critical movements operating at LoS 'D' to LoS 'F';
- At full occupancy (year 2024), the results are similar to year 2019 results with minimal mitigation recommended;
- Significant traffic pattern changes are anticipated with the removal of the HWY 417 eastbound on-ramp and the implementation of the transit priority corridor along Carling Avenue. In addition, the future transit priority corridor

will help reduce the reliance on passenger automobiles, ultimately reducing the number of vehicles on the roadway;

- The total projected 2024 traffic volume scenario was assessed with a 4-lane cross section along Carling Avenue and results reveal some capacity constraints for the east and westbound movements, given the reduced passenger vehicle capacity. As mentioned, the transit priority design plans for Carling Avenue will ultimately help reduce the number of vehicles on the roadways;
- There is a significant amount of existing and projected U-turning vehicles at the Carling/Westgate Shopping Centre intersection. There is a high demand for vehicles to turn around to access HWY 417. The total projected 2024 volume scenario indicates that this movement is projected to operate at LoS 'D' with 95th percentile queues that extend past the provided storage lane;
 - With future modifications to the road network, travel patterns are expected to change significantly and the queues at this intersection may be reduced;
 - A protected/permitted eastbound left-turn signal phase is recommended during the morning peak hour (already implemented during the afternoon peak hour);
 - Implementing a 'no-right-on-red' restriction for the southbound movement would likely reduce the amount of vehicle conflicts with U-turning vehicles;

SITE PLAN

- Based on projected volumes and proximity to adjacent intersections, additional traffic control/auxiliary turn lanes are not warranted or required at the proposed driveway connections;
- The proposed vehicle / bicycle parking supply and dimensioning; and the proposed drive aisles widths of 6.7m are sufficient with respect to the City's By-Law requirements;
- The proposed driveway connections meet the City's Private Approach By-Law requirements with respect to spacing, with the exception of the Building B accesses, which have been placed closer together in order to maximize the distance from Carling Avenue; and
- The proposed number of accesses exceeds that recommended in the Private Approach By-Law. However, this plan is recommended as it separates the underground garage accesses from the surface parking lot entrances, reducing the number of conflict points on the site, while having a minimal impact on the adjacent streets.

Based on the foregoing, the proposed development fits well into the context of the surrounding area, and its location and design serves to promote use of walking, cycling, and transit modes, thus supporting City of Ottawa policies, goals and objectives with respect to redevelopment, intensification and modal share.

Therefore, the proposed 1354 Carling Avenue residential development is recommended from a transportation perspective.

Prepared By:

André Jane Sponder B.A.Sc. Engineering Associate, Transportation

Reviewed By:

Christopher Gordon, P.Eng. Senior Project Manager, Transportation

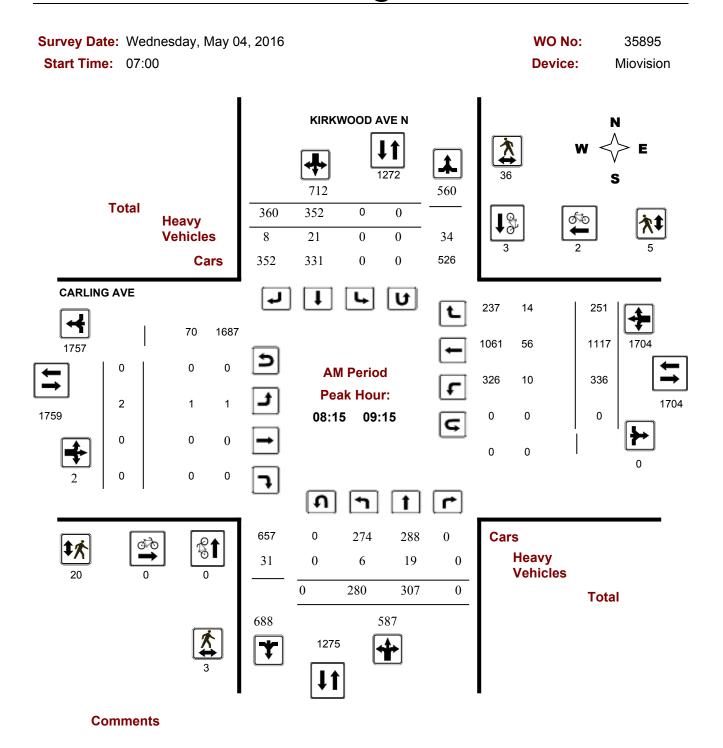






Transportation Services - Traffic Services

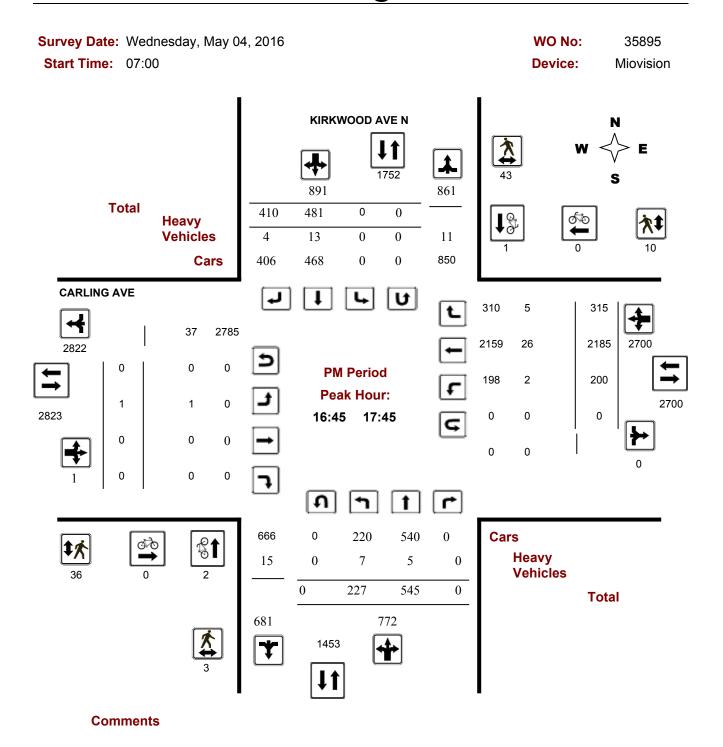
Turning Movement Count - Full Study Peak Hour Diagram KIRKWOOD AVE N @ CARLING AVE





Transportation Services - Traffic Services

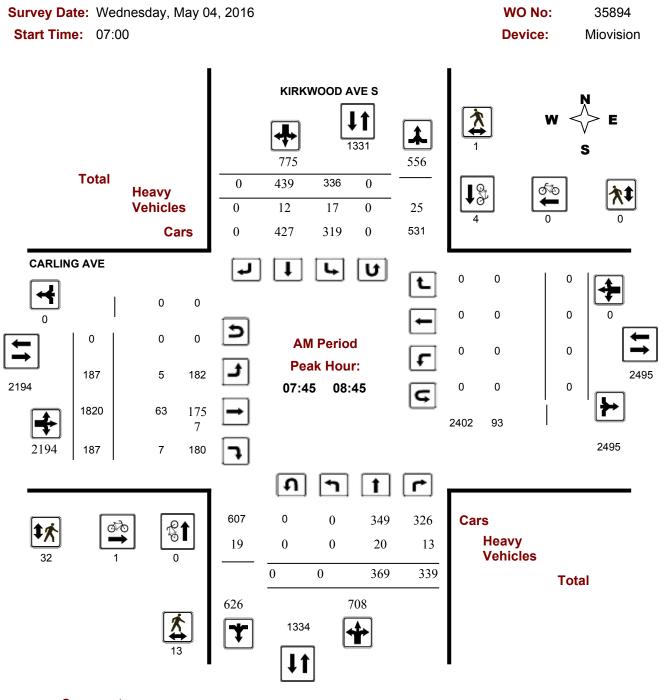
Turning Movement Count - Full Study Peak Hour Diagram KIRKWOOD AVE N @ CARLING AVE





Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram CARLING AVE @ KIRKWOOD AVE S

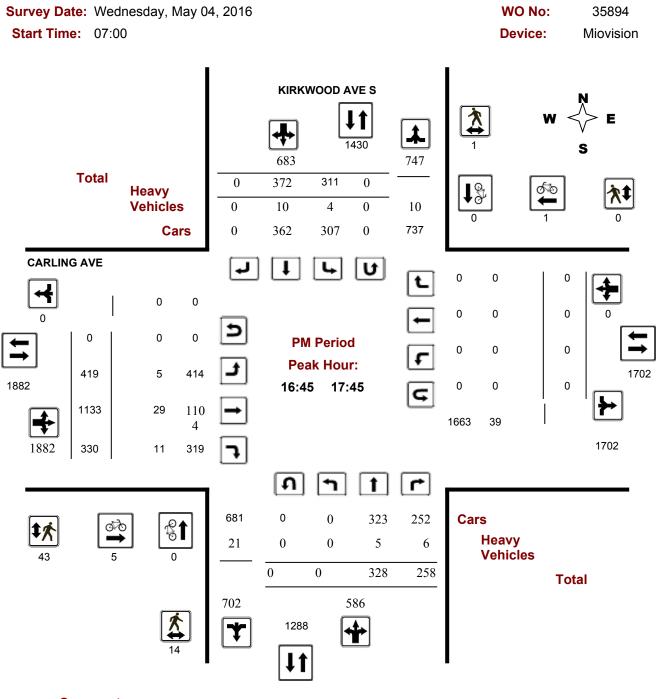


Comments



Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram CARLING AVE @ KIRKWOOD AVE S



Comments



Transportation Services - **Traffic Services W.O**.

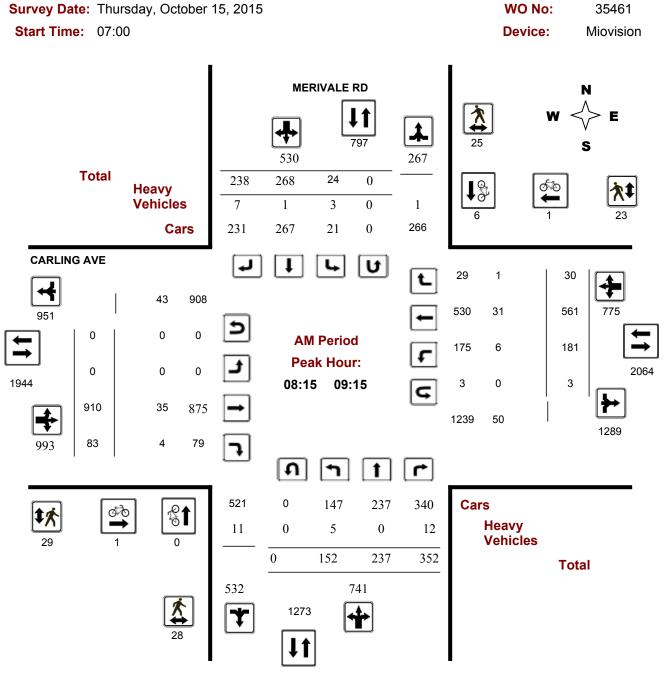
Turning Movement Count - 15 Minute Summary Report

CARLING AVE @ MERIVALE RD

Sur	vey D	ate:	F	Thurso	day, Aı	ugust	04, 20	016		orthbour	nd:	Obser	So	outhbour	nd: ()					
									E	astboun	id:	2		estboun	5	2				
		N 1.	orthbou		IVALE		uthbour	vd.			Гc	stbound	JARL	ING A		stbound				
 .	.				N				S	STR			пт	E				W		Grand
	Period 07:15	<u>LT</u>	ST	RT	<u>TOT</u>	LT	ST 40	RT	TOT	TOT	LT	ST 107	RT	TOT	LT	ST	RT	TOT	TOT	Total
		16 20	26	36	78	6	49 55	56	111	189	0	107	9	116	21	58	6	86 80	202	391
07:15	07:30 07:45	26 22	29	43	98	4	55 52	48	107	205 224	0	117 151	9	126	15 23	62 01	3	80 120	206	411
07:30 07:45	07.45	22	38 55	57 67	117	8	53 51	46 62	107		1 0	169	15 10	167	23 33	91 04	6	120	287 313	511 575
		23	55		145	4	51 52	62 62	117	262			10	179		94 102	5	134		575
08:00	08:15	34 42	39 52	51 60	124	3	52	62	117	241	0	198	11	209	30 26	102	8	140	349	
08:15	08:30	42	53	69 50	164	9 5	53 50	51	113	277	0	164	17	181	26 50	109	9	145	326	603 607
08:30	08:45	30 42	56 40	56 57	142	5	52 57	48	105	247	1	183	12 °	196 152	50 22	132	2	184	380 244	627 596
08:45 09:00	09:00	42 17	40 27	57 53	139 97	9	57 53	47 50	113	252	0	145 140	8	153	32 30	146	13 6	191	344	596
	09:15	17 36	27	53 33	97 103	9 7	53 60	59 64	121 121	218 234	0 0	149 136	12 24	161 161	30 32	117	6 10	155 172	316 333	534
09:15 09:30	09:30 09:45	36 21	34 38	33 38		7 11	60 46	64 60	131	234 214	0	136 141	24 20		32 24	126 119	10 12	172		567 532
09:30	10:00				97 94	11	46 52		117 130	214 224	0		20 32	161 127		119		157 149	318 286	532 510
		27	32 55	35	94 125	21		67 62	130	224 275	2	105		137 128	26 36		8 10	149 191	286 319	510
11:30	11:45	38	55	32			67 55					101	25		36 20	145				
11:45	12:00	40	46 50	49	135	12	55	53	120	255	0	123	20	143	39	143	12	194	337	592
12:00	12:15	34 26	52 40	46	132	8	62 50	61	131	263	0	117	17	134	31 27	169	13	213	347	610
12:15	12:30	36	49	44	129	15	50	51 50	116	245	1	142	18	161	37	147	7	191	352	597
12:30	12:45	34	56	40	130	15	43	58	116	246	0	140	26	166	44	147	8	200	366	612
12:45	13:00	40	41	39	120	18	45	37	100	220	0	139	18	157	42	150	16	209	366	586
13:00	13:15	33	38	38	109	10	47	48	105	214	0	150	27	177	33	147	14	194	371	585
13:15	13:30	41	49	41	131	20	54	48	122	253	0	110	20	130	35	134	19	190	320	573
15:00	15:15	27	67	46	140	5	76	65	146	286	0	117	22	139	51	222	14	291	430	716
	15:30	15	47	37	99	7	63	52	122	221	0	138	32	170	62	276	10	349	519	740
	15:45	42	52	48	142	25	80	55	160	302	0	112	31	143	50	294	12	359	502	804
	16:00	23	34	43	100	20	61	46	127	227	0	158	30	188	64	313	7	386	574	801
	16:15	35	54	43	133	18	68	66	152	285	0	270	16	286	75	321	7	403	689	974
	16:30	25	39	45	109	11	67	30	108	217	0	203	30	233	82	341	10	433	666	883
	16:45	25	53	43	121	12	71	44	127	248	0	150	25	175	74	279	9	363	538	786
	17:00	38	48	49	135	10	58	48	116	251	0	151	29	180	81	353	14	448	628	879
	17:15	31	50	52	133	19	69	49	137	270	0	147	28	176	78	314	11	404	580	850
	17:30	21	40	54	115	11	58	49	118	233	0	157	27	184	73	312	9	395	579	812
	17:45	38	38	37	113	9	61	30	100	213	0	114	27	141	62	174	7	244	385	598
17:45	18:00	23	32	53	108	7	49	39	95	203	0	122	24	146	60	179	5	245	391	594
TOTAL	_: 9	975	1407	1474	3857	359	1837	1661	3857	7714	5	4626	671	5304	1451	5830	30	2 76 ′	15 12919	206



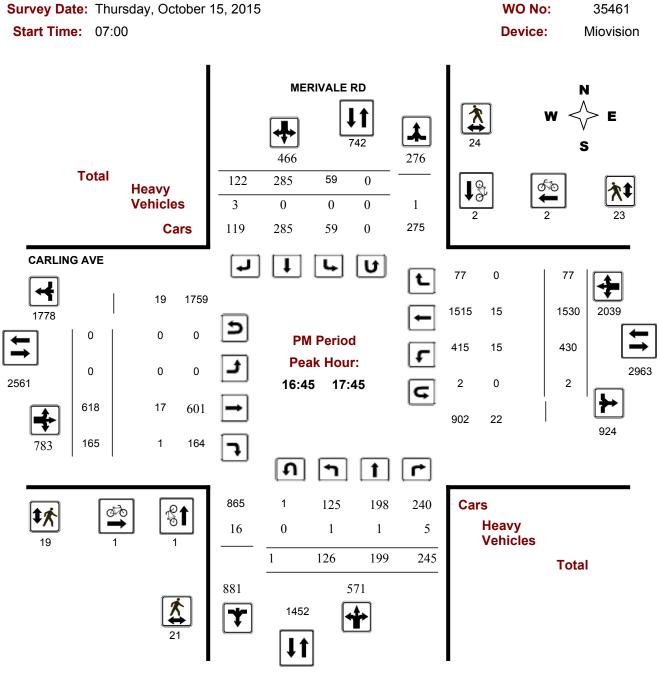
Turning Movement Count - Full Study Peak Hour Diagram CARLING AVE @ MERIVALE RD



Comments



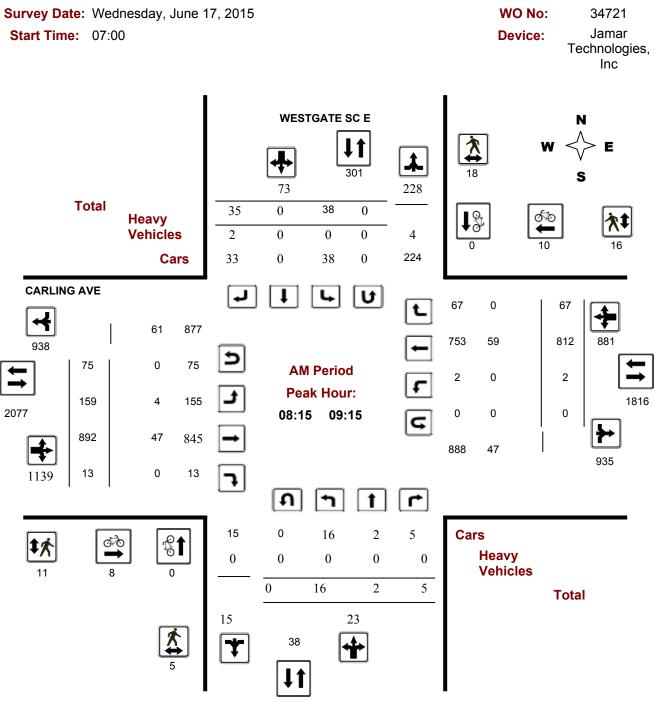
Turning Movement Count - Full Study Peak Hour Diagram CARLING AVE @ MERIVALE RD





Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram CARLING AVE @ WESTGATE SC E

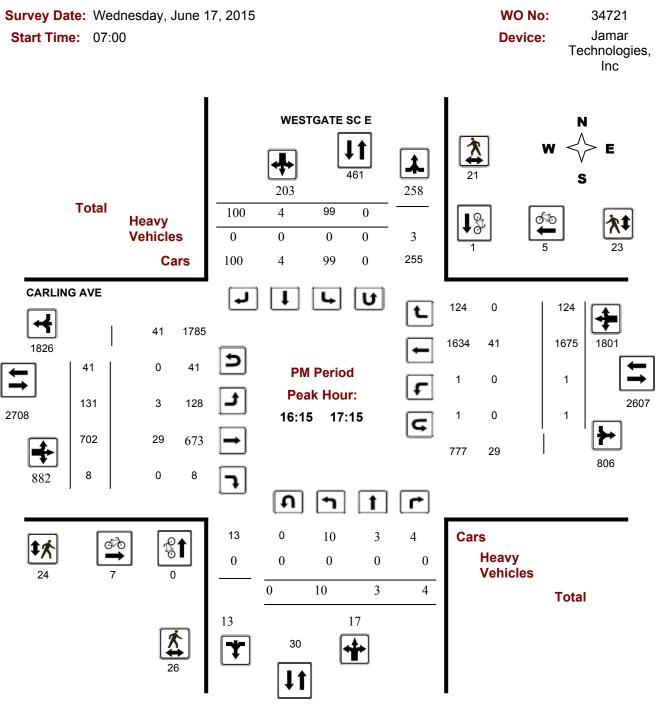


Comments



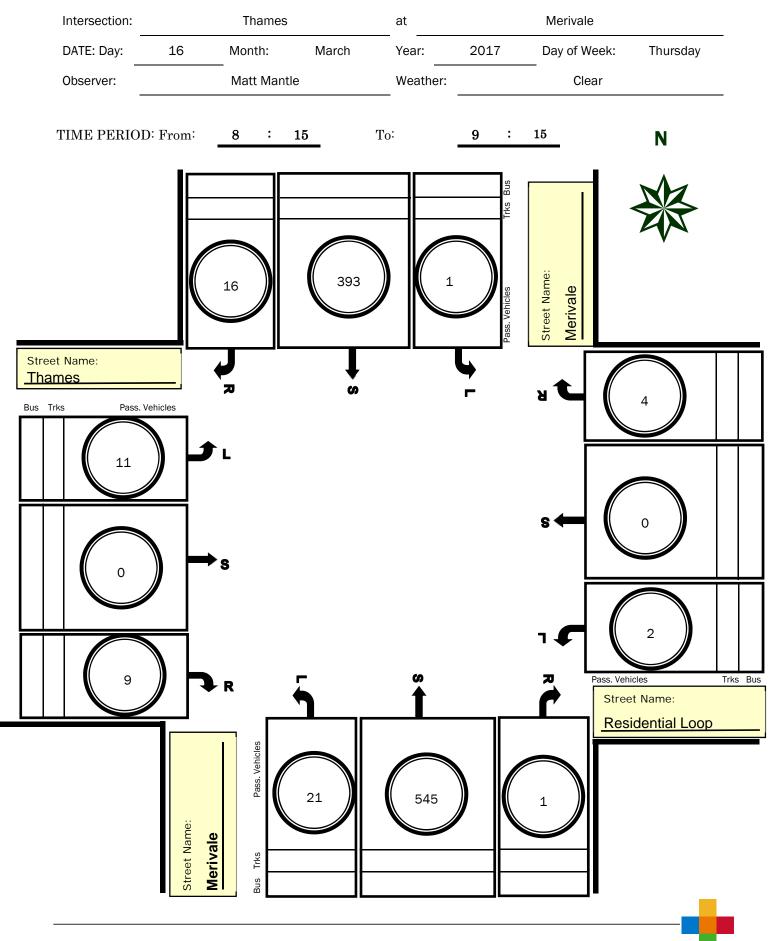
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram CARLING AVE @ WESTGATE SC E



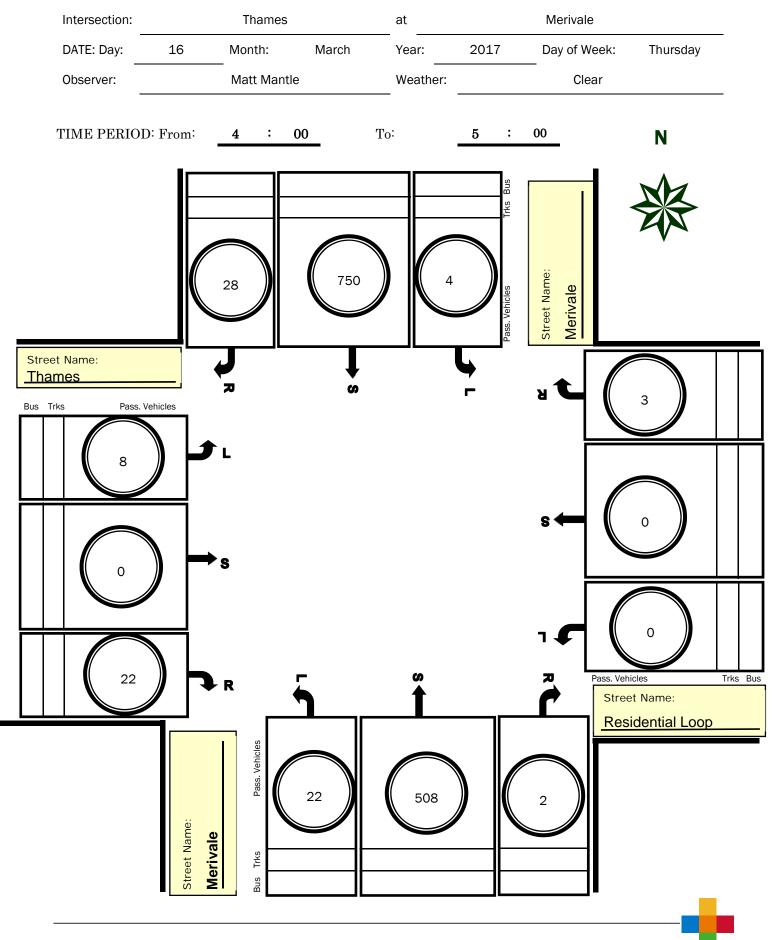
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Appendix B SYNCHRO Capacity Analysis – Existing Conditions

Existing AM 1: Kirkwood & Carling EB

1: Kirkwood & Carling EB							
	∕	-	\mathbf{i}	†	1	×	Ļ
Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Configurations Traffic Volume (vph)	<mark>۴</mark> 187	∢††† 1820	7 187	↑↑ 369	7 339	5 336	† 439
Future Volume (vph)	187	1820	187	369	339	336	439 439
Lane Group Flow (vph)	107	1936	107	388	357	354	439
Turn Type	Perm	NA	Perm	NA	Perm		402 NA
Protected Phases	Felli	2	Feilli	8	Feilii	pm+pt 7	4
Permitted Phases	2	2	2	0	8	4	4
Detector Phase	2	2	2	8	8	7	4
Switch Phase	Z	Z	Z	0	0	1	4
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	5.0	10.0
Minimum Split (s)	29.2	29.2	29.2	26.1	26.1	10.1	26.1
Total Split (s)	58.0	58.0	58.0	38.0	38.0	24.0	62.0
Total Split (%)	48.3%	48.3%	48.3%	31.7%	31.7%	24.0	51.7%
Yellow Time (s)	40.378	40.378	40.3%	31.778	31.778	3.3	3.3
All-Red Time (s)	2.5	2.5	2.5	2.8	2.8	3.3 1.8	2.8
Lost Time Adjust (s)	-2.2	-2.2	-2.2	-2.8	-2.8	-1.1	-2.8
Total Lost Time (s)	-2.2	-2.2	-2.2	-2.1 4.0	-2.1 4.0	-1.1 4.0	-2.1
	4.0	4.0	4.0		4.0 Lag	4.0 Lead	4.0
Lead/Lag				Lag	0		
Lead-Lag Optimize? Recall Mode	C May	C May	C Mov	Yes	Yes	Yes	Min
	C-Max	C-Max	C-Max 55.7	Min	Min	Min 56.3	Min 56.3
Act Effct Green (s)	55.7	55.7		32.3	32.3		
Actuated g/C Ratio v/c Ratio	0.46	0.46 0.91	0.46	0.27	0.27 0.88	0.47 0.75	0.47
	0.26		0.26	0.43			0.55
Control Delay	21.5	37.5	6.0	37.5	64.6	29.7	23.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.5
Total Delay	21.5	37.5	6.0	37.5	64.6	29.7	24.1
LOS Annreach Delau	С	D	A	D	E	С	C
Approach Delay		33.6		50.5			26.5
Approach LOS	<u> </u>	С	F 4	D	70.0	50.7	C
Queue Length 50th (m)	29.6	164.1	5.1	38.9	78.9	50.7	81.2
Queue Length 95th (m)	48.2	#194.8	18.6	53.2	#127.0	78.4	112.9
Internal Link Dist (m)	10.0	161.6		158.6	00.0		152.2
Turn Bay Length (m)	40.0	0101			90.0		<u></u>
Base Capacity (vph)	676	2136	751	960	429	474	862
Starvation Cap Reductn	0	0	0	0	0	0	127
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.91	0.26	0.40	0.83	0.75	0.63
Intersection Summary							
Cycle Length: 120							
Actuated Cycle Length: 120							
Offset: 15 (13%), Referenced to ph	ase 2. FRTL	Start of Gree	n				
Natural Cycle: 80	IASE Z.LDTL,						
Control Type: Actuated-Coordinate	d						
Maximum v/c Ratio: 0.91	iu -						
Intersection Signal Delay: 35.4				In	tersection L	00 D	
Intersection Capacity Utilization 82	6%				CU Level of S		
Analysis Period (min) 15	.070			IC.	U Level UI		
# 95th percentile volume exceeds	s capacity du	ouo may bo	longor				
Queue shown is maximum after		eue may be	ionger.				
	IND CYCIES.						
Splits and Phases: 1: Kirkwood a	& Carling EB				1.		
,					₽ Ø4		
58 s					62 s		
					Ø7		
					24 s		
L					1210		

Existing AM 2: Merivale & Carling

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Lane Group	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	<u>ተተ</u> ኑ	ň	ተተቡ	۲	1	1	٢	1	1	
Traffic Volume (vph)	910	181	561	152	237	352	24	268	238	
Future Volume (vph)	910	181	561	152	237	352	24	268	238	
Lane Group Flow (vph)	1045	191	623	160	249	371	25	282	251	
Turn Type	NA	pm+pt	NA	Prot	NA	Perm	Prot	NA	Perm	
Protected Phases	2	1	6	3	8		7	4		
Permitted Phases		6				8			4	
Detector Phase	2	1	6	3	8	8	7	4	4	
Switch Phase										
Minimum Initial (s)	10.0	5.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	
Minimum Split (s)	29.0	10.4	29.0	11.3	37.7	37.7	11.3	37.7	37.7	
Total Split (s)	49.0	12.0	61.0	21.0	38.0	38.0	21.0	38.0	38.0	
Total Split (%)	40.8%	10.0%	50.8%	17.5%	31.7%	31.7%	17.5%	31.7%	31.7%	
Yellow Time (s)	3.7	3.7	3.7	3.3	3.3	3.3	3.3	3.3	3.3	
All-Red Time (s)	2.3	1.7	2.3	3.0	3.4	3.4	3.0	3.4	3.4	
Lost Time Adjust (s)	-2.0	-1.4	-2.0	-2.3	-2.7	-2.7	-2.3	-2.7	-2.7	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lag	Lead		Lead	Lag	Lag	Lead	Lag	Lag	
Lead-Lag Optimize? Recall Mode	Yes C Max	Yes	C-Max	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode Act Effct Green (s)	C-Max 49.2	None 64.9	64.9	None 16.1	None 38.4	None 38.4	None 9.6	None 27.1	None 27.1	
Actuated g/C Ratio	49.2 0.41	04.9	04.9	0.13	0.32	0.32	9.0 0.08	0.23	0.23	
//c Ratio	0.41	0.54	0.34	0.13	0.32	0.52	0.08	0.23	0.23	
Control Delay	22.6	30.2	15.5	66.9	35.3	8.3	54.0	51.9	13.1	
Queue Delay	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Fotal Delay	22.9	30.2	15.5	66.9	35.3	8.3	54.0	51.9	13.1	
.OS	С	C	B	E	D	A	D 1.0	D	B	
Approach Delay	22.9	-	19.0	_	28.9		-	34.5	-	
Approach LOS	С		В		С			С		
Queue Length 50th (m)	48.3	23.1	27.6	36.2	48.1	7.0	5.6	61.1	9.6	
Queue Length 95th (m)	62.7	#56.7	39.4	#62.2	69.3	32.1	14.1	84.3	31.4	
nternal Link Dist (m)	89.4		139.3		159.9			100.7		
Turn Bay Length (m)		90.0		40.0			28.0		35.0	
Base Capacity (vph)	1970	289	2605	240	570	690	240	505	551	
Starvation Cap Reductn	381	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	0.66	0.66	0.24	0.67	0.44	0.54	0.10	0.56	0.46	
ntersection Summary										
Cycle Length: 120										
Actuated Cycle Length: 120										
Offset: 54 (45%), Referenced to pl	hase 2:EBT and	d 6:WBTL,	Start of Gree	en						
Natural Cycle: 90										
Control Type: Actuated-Coordinate	ed									
Maximum v/c Ratio: 0.70										
ntersection Signal Delay: 25.4					ersection L(
ntersection Capacity Utilization 75	5.2%			IC	U Level of S	Service D				
Analysis Period (min) 15										
95th percentile volume exceed		ue may be	longer.							
Queue shown is maximum afte	er two cycles.									
Splits and Phases: 2: Merivale &	& Carling									
✓ Ø1 • Ø2 (R)					1	73		4 Ø4		
12 s 49 s					21 s	55		¥ Ø4 38 s		
495								J0 S		
🔽 Ø6 (R) 🏮					\$	ð7		[™] Ø8		
61 s					21 s			38 s		

Existing AM 3: Carling & Westgate SC

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Lane Group	EBU	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR	
Lane Configurations		N.	ተተኈ	۲	ተተኈ		4		र्स	1	
Traffic Volume (vph)	75	159	892	2	753	16	2	38	0	35	
Future Volume (vph)	75	159	892	2	753	16	2	38	0	35	
Lane Group Flow (vph)	0	246	953	2	864	0	24	0	40	37	
Turn Type	Perm	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	
Protected Phases			2		6		8		4		
Permitted Phases	2	2		6		8		4		4	
Detector Phase	2	2	2	6	6	8	8	4	4	4	
Switch Phase											
Vinimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	23.6	23.6	23.6	23.6	23.6	37.0	37.0	37.0	37.0	37.0	
Total Split (s)	83.0	83.0	83.0	83.0	83.0	37.0	37.0	37.0	37.0	37.0	
Total Split (%)	69.2%	69.2%	69.2%	69.2%	69.2%	30.8%	30.8%	30.8%	30.8%	30.8%	
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	1.9	1.9	1.9	1.9	1.9	4.0	4.0	4.0	4.0	4.0	
Lost Time Adjust (s)	1.7	-1.6	-1.6	-1.6	-1.6	т.0	-3.0	т.0	-3.0	-3.0	
Total Lost Time (s)		-1.0	-1.0	-1.0	4.0		-3.0		-3.0	-3.0	
Lead/Lag		4.0	4.0	4.0	4.0		4.0		4.0	4.0	
Lead-Lag Optimize?											
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None	None	
Act Effct Green (s)	C-IVIAX	99.1	99.1	99.1	99.1	None	17.1	None	17.1	17.1	
			0.83							0.14	
Actuated g/C Ratio		0.83		0.83	0.83		0.14		0.14		
//c Ratio		0.54	0.24	0.00	0.22		0.12		0.22	0.15	
Control Delay		5.7	1.9	5.0	3.5		35.7		45.4	12.9	
Queue Delay		0.0	0.0	0.0	0.1		0.0		0.0	0.0	
Total Delay		5.7	1.9	5.0	3.6		35.7		45.4	12.9	
LOS		А	A	А	A		D		D	В	
Approach Delay			2.7		3.6		35.7		29.8		
Approach LOS		F 4	A	0.4	A		D		С	0.0	
Queue Length 50th (m)		5.4	5.5	0.1	15.6		4.1		8.8	0.0	
Queue Length 95th (m)		m16.2	m17.1	m0.4	29.2		10.0		16.0	8.1	
Internal Link Dist (m)			168.6		89.4		10.8		75.6		
Turn Bay Length (m)		70.0		36.0							
Base Capacity (vph)		454	4012	415	3951		381		357	433	
Starvation Cap Reductn		0	0	0	1579		0		0	0	
Spillback Cap Reductn		0	0	0	0		0		0	0	
Storage Cap Reductn		0	0	0	0		0		0	0	
Reduced v/c Ratio		0.54	0.24	0.00	0.36		0.06		0.11	0.09	
ntersection Summary											
Cycle Length: 120											
Actuated Cycle Length: 120											
Offset: 26 (22%), Referenced to pha	se 2:EBTL a	and 6:WRTI	Start of Gr	een							
Natural Cycle: 90				0.011							
Control Type: Actuated-Coordinated											
Vaximum v/c Ratio: 0.54											
ntersection Signal Delay: 4.4				In	tersection L(۵. ۲۷					
ntersection Capacity Utilization 72.8	3%				U Level of S						
Analysis Period (min) 15	0/0			IC	O LEVELUI 3						
	ia is motores	hy unstrop	m signal								
m Volume for 95th percentile queu	ie is metered	i ny upstrea	ni siyridi.								
Splits and Phases: 3: Carling & W	/estgate SC										
^{ss} ø2 (R)								∲ ø4			

Ø2 (R)	∲ ⊳ø4
83 s	37 s
🖸 😽 Ø6 (R)	<\$ ↑ ø8
83 s	37 s

Existing AM 4: Kirkwood & Carling WB

	4	4	•	Ť	Ŧ	4	
Lane Group	WBL	WBT	NBL	NBT	SBT	SBR	
Lane Configurations	۲	ፈቶኩ	۲	1	<u>††</u>	1	
Traffic Volume (vph)	336	1117	280	307	352	360	
Future Volume (vph)	336	1117	280	307	352	360	
Lane Group Flow (vph)	319	1475	295	323	371	379	
Turn Type	Perm	NA	pm+pt	NA	NA	Perm	
Protected Phases		6	3	8	4		
Permitted Phases	6		8			4	
Detector Phase	6	6	3	8	4	4	
Switch Phase							
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0	
Ainimum Split (s)	35.3	35.3	11.0	29.0	29.0	29.0	
otal Split (s)	58.0	58.0	24.0	62.0	38.0	38.0	
otal Split (%)	48.3%	48.3%	20.0%	51.7%	31.7%	31.7%	
ellow Time (s)	3.7	3.7	3.3	3.3	3.3	3.3	
II-Red Time (s)	2.6	2.6	2.7	2.7	2.7	2.7	
ost Time Adjust (s)	-2.3	-2.3	-2.0	-2.0	-2.0	-2.0	
otal Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	
ead/Lag	4.0	4.0	Lead	4.0	Lag	Lag	
ead-Lag Optimize?			Yes		Yes	Yes	
ecall Mode	C-Max	C-Max	None	Ped	Ped	Ped	
ct Effct Green (s)	57.7	57.7	54.3	54.3	31.2	31.2	
ctuated g/C Ratio	0.48	0.48	0.45	0.45	0.26	0.26	
/c Ratio	0.46	0.48	0.43	0.43	0.20	0.20	
ontrol Delay	24.5	26.2	20.2	15.3	38.0	49.6	
,	24.5	0.0	0.0	0.0	38.0 0.0	49.0	
ueue Delay	24.5	26.2	20.2	15.3	38.0	49.6	
otal Delay OS	24.3 C	20.2 C	20.2 C	15.5 B	30.U D	49.0 D	
	C	25.9	C	17.7	43.8	D	
pproach Delay							
pproach LOS	(0.2	C	40.0	B	D	(2.0	
Queue Length 50th (m)	60.2	105.1	48.9	53.8	37.0	63.8	
Queue Length 95th (m)	90.5	124.2	m70.5	m76.2	51.0	#110.7	
nternal Link Dist (m)	40.0	110.3		152.2	73.8	22.0	
urn Bay Length (m)	40.0	0100	4/7	0/0	0/0	22.0	
ase Capacity (vph)	698	2139	467	862	960	478	
tarvation Cap Reductn	0	0	0	0	0	0	
pillback Cap Reductn	0	0	0	0	0	0	
torage Cap Reductn	0	0	0	0	0	0	
educed v/c Ratio	0.46	0.69	0.63	0.37	0.39	0.79	
tersection Summary							
ycle Length: 120							
ctuated Cycle Length: 120							
offset: 66 (55%), Referenced to phase	6:WBTL,	Start of Gre	en				
atural Cycle: 80							
control Type: Actuated-Coordinated							
laximum v/c Ratio: 0.85							
ntersection Signal Delay: 28.5				Int	ersection L	OS: C	
tersection Capacity Utilization 82.6%				IC	U Level of S	Service E	
nalysis Period (min) 15							
95th percentile volume exceeds ca	pacity, qu	eue may be	longer.				
Queue shown is maximum after two		-					
Volume for 95th percentile queue i	s metered	l by upstrear	m signal.				
Splits and Phases: 4: Kirkwood & Ca	arling WB						
	5 -				•		4
					Ø 3		₩ Ø4
-					24 s		38 s
Ø6 (R)					1 Ø8		

52

58 s

Existing AM 5: Merivale & Thames

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		\$			\$			4î b			4î b	
Traffic Volume (veh/h)	11	0	9	2	0	4	21	726	1	1	515	16
Future Volume (Veh/h)	11	0	9	2	0	4	21	726	1	1	515	16
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	12	0	9	2	0	4	22	764	1	1	542	17
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)											184	
pX, platoon unblocked												
vC, conflicting volume	982	1362	280	1090	1370	382	559			765		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	982	1362	280	1090	1370	382	559			765		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	94	100	99	99	100	99	98			100		
cM capacity (veh/h)	198	144	718	164	142	616	1008			844		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	21	6	404	383	272	288						
Volume Left	12	2	22	0	1	0						
Volume Right	9	4	0	1	0	17						
cSH	288	321	1008	1700	844	1700						
Volume to Capacity	0.07	0.02	0.02	0.23	0.00	0.17						
Queue Length 95th (m)	1.8	0.4	0.5	0.0	0.0	0.0						
Control Delay (s)	18.5	16.4	0.7	0.0	0.0	0.0						
Lane LOS	C	C	A	0.0	A	0.0						
Approach Delay (s)	18.5	16.4	0.4		0.0							
Approach LOS	C	C			0.0							
Intersection Summary												
Average Delay			0.6									
Intersection Capacity Utilization			47.2%	ICI	J Level of S	ervice			А			
Analysis Period (min)			15									

Existing PM 1: Kirkwood & Carling EB

	≯	+	*	Ť	*	1	ţ	
Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT	
Lane Configurations	<u> </u>	4412	1	^	1011	<u> </u>	<u>+</u>	
Traffic Volume (vph)	419	1133	330	328	258	311	372	
Future Volume (vph)	419	1133	330	328	258	311	372	
Lane Group Flow (vph)	392	1242	347	345	272	327	392	
Turn Type	Perm	NA	Perm	NA	Perm	pm+pt	NA	
Protected Phases		2		8		7	4	
Permitted Phases	2		2		8	4		
Detector Phase	2	2	2	8	8	7	4	
Switch Phase	10.0	10.0	10.0	10.0	10.0	FO	10.0	
Minimum Initial (s)	10.0 29.2	10.0	10.0 29.2	10.0	10.0	5.0 10.1	10.0	
Minimum Split (s)	29.2 61.0	29.2 61.0	29.2 61.0	26.1 29.0	26.1 29.0	30.0	26.1 59.0	
Total Split (s) Total Split (%)	50.8%	50.8%	50.8%	29.0	29.0	25.0%	49.2%	
Yellow Time (s)	3.7	3.7	3.7	3.3	3.3	3.3	3.3	
All-Red Time (s)	2.5	2.5	2.5	2.8	2.8	1.8	2.8	
Lost Time Adjust (s)	-2.2	-2.2	-2.2	-2.1	-2.1	-1.1	-2.1	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lead/Lag				Lag	Lag	Lead		
Lead-Lag Optimize?				Yes	Yes	Yes		
Recall Mode	C-Max	C-Max	C-Max	Min	Min	Min	Min	
Act Effct Green (s)	58.9	58.9	58.9	24.5	24.5	53.1	53.1	
Actuated g/C Ratio	0.49	0.49	0.49	0.20	0.20	0.44	0.44	
v/c Ratio	0.55	0.55	0.41	0.50	0.88	0.67	0.50	
Control Delay	25.6	22.9	5.9	45.0	74.6	15.3	11.9	
Queue Delay	0.3 25.8	0.1 22.9	0.0 5.9	0.0 45.0	0.0	0.0	0.0	
Total Delay LOS	25.8 C	22.9 C	5.9 A	45.0 D	74.6 E	15.3 B	11.9 B	
Approach Delay	U	20.5	А	58.0	E	В	В 13.5	
Approach LOS		20.3 C		58.0 E			13.5 B	
Queue Length 50th (m)	75.1	79.4	8.8	37.9	62.3	20.0	73.2	
Queue Length 95th (m)	110.9	94.3	27.9	52.7	#108.3	m57.4	m100.2	
Internal Link Dist (m)		161.6		158.6			144.7	
Turn Bay Length (m)	40.0				90.0			
Base Capacity (vph)	715	2256	844	712	318	500	817	
Starvation Cap Reductn	0	0	0	0	0	0	0	
Spillback Cap Reductn	52	109	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.59	0.58	0.41	0.48	0.86	0.65	0.48	
Intersection Summary								
Cycle Length: 120								
Actuated Cycle Length: 120								
Offset: 81 (68%), Referenced to pha	ase 2:EBTL, S	Start of Gree	en					
Natural Cycle: 70								
Control Type: Actuated-Coordinated	d							
Maximum v/c Ratio: 0.88								
Intersection Signal Delay: 26.0					tersection L(
Intersection Capacity Utilization 95.	.8%			IC	U Level of S	Service F		
Analysis Period (min) 15	a a mar the second		longer:					
# 95th percentile volume exceeds		eue may be	ionger.					
Queue shown is maximum after		hyunotrop	m cianal					
m Volume for 95th percentile que	ue is metered	by upstream	n siyndi.					
Splits and Phases: 1: Kirkwood &	& Carling EB							
Ø2 (R)						ð4		
61 s					59 s			
					*	07		
					30 s			

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Lane Group	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	ተተኈ	ň	ተተቡ	۲	1	1	٦	1	1
Traffic Volume (vph)	618	430	1530	126	199	245	59	285	122
Future Volume (vph)	618	430	1530	126	199	245	59	285	122
Lane Group Flow (vph)	825	453	1692	133	209	258	62	300	128
Turn Type	NA	pm+pt	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	2	ppt	6	3	8	T OIIII	7	4	1 Onn
Permitted Phases	_	6	-	-	-	8			4
Detector Phase	2	1	6	3	8	8	7	4	4
Switch Phase									
Minimum Initial (s)	10.0	5.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	29.0	10.4	29.0	11.3	37.7	37.7	11.3	37.7	37.7
Total Split (s)	42.0	20.0	62.0	20.0	38.0	38.0	20.0	38.0	38.0
Total Split (%)	35.0%	16.7%	51.7%	16.7%	31.7%	31.7%	16.7%	31.7%	31.7%
Yellow Time (s)	3.7	3.7	3.7	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.3	1.7	2.3	3.0	3.4	3.4	3.0	3.4	3.4
Lost Time Adjust (s)	-2.0	-1.4	-2.0	-2.3	-2.7	-2.7	-2.3	-2.7	-2.7
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lag	Lead		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	C-Max	None	C-Max	None	None	None	None	None	None
Act Effct Green (s)	38.0	65.4	65.4	14.8	33.0	33.0	12.0	27.8	27.8
Actuated g/C Ratio	0.32	0.54	0.54	0.12	0.28	0.28	0.10	0.23	0.23
v/c Ratio	0.54	1.01	0.64	0.64	0.43	0.44	0.37	0.73	0.29
Control Delay	26.7	71.3	21.5	64.1	38.9	6.5	55.7	52.7	6.8
Queue Delay	0.6	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.4	71.3	21.6	64.1	38.9	6.5	55.7	52.7	6.8
LOS Approach Dolou	C	E	C	E	D	А	E	D	А
Approach Delay	27.4		32.1		30.5			41.1	
Approach LOS	C 22.1	07 1	C	20.0	C	0.0	12.0	D	0.0
Queue Length 50th (m)	33.1 42.1	~87.1 #172.0	100.5	29.9 50.4	40.9	0.0 19.3	13.9	65.4 89.9	0.0 13.0
Queue Length 95th (m)	42.1 81.2	#172.0	130.1 139.3	00.4	62.0	19.3	26.8	89.9	13.0
Internal Link Dist (m) Turn Bay Length (m)	ŏ1.Z	90.0	139.3	40.0	161.9		28.0	100.7	35.0
Base Capacity (vph)	1519	90.0 450	2630	226	511	602	28.0	505	510 510
Starvation Cap Reductn	340	430	2030	0	0	002	0	0	0
Spillback Cap Reductin	0 0	0	104	0	0	0	0	0	2
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.70	1.01	0.67	0.59	0.41	0.43	0.27	0.59	0.25
	0.70		5.67	5.07	5.11	3.10	0.27	0.07	0.20
Intersection Summary									
Cycle Length: 120 Actuated Cycle Length: 120									
Offset: 15 (13%), Referenced to	nhase 2.ERT an	d 6./WBTI	Start of Gro	on					
Natural Cycle: 110	phase z.edi ali	U U.WDIL,	Start OF GIE	CII					
Control Type: Actuated-Coordina	ated								
Maximum v/c Ratio: 1.01	ncu								
Intersection Signal Delay: 32.0				In	tersection L	05.0			
Intersection Capacity Utilization 8	85.5%				U Level of S				
Analysis Period (min) 15				iC					
 Volume exceeds capacity, qu 	Jeue is theoretic	ally infinite							
Queue shown is maximum af		any minine.							
# 95th percentile volume exceeded		eue may be	longer						
Queue shown is maximum af		sao may be							
Splits and Phases: 2: Merivale	& Carling								
	5				•	~~		*	
√ Ø1 -	₱Ø2 (R)					Ø3		∜ Ø4	
20 s 42	S				20 s	3		38 s	

Existing PM 2: Merivale & Carling

Ø6 (R)

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3 s

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Existing PM 3: Carling & Westgate SC

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Lane Group	EBU	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR	
Lane Configurations		Ä	ተተኈ	۲	ተተኈ		4		र्स	1	
Traffic Volume (vph)	41	131	702	1	1675	10	3	99	4	100	
Future Volume (vph)	41	131	702	1	1675	10	3	99	4	100	
Lane Group Flow (vph)	0	181	747	1	1894	0	18	0	108	105	
Turn Type	pm+pt	pm+pt	NA	Perm	NA	Perm	NA	Perm	NA	Perm	
Protected Phases	5	5	2		6		8		4		
Permitted Phases	2	2		6		8		4		4	
Detector Phase	5	5	2	6	6	8	8	4	4	4	
Switch Phase											
Vinimum Initial (s)	5.0	5.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	10.6	10.6	23.6	23.6	23.6	37.0	37.0	37.0	37.0	37.0	
Total Split (s)	24.0	24.0	83.0	59.0	59.0	37.0	37.0	37.0	37.0	37.0	
Fotal Split (%)	20.0%	20.0%	69.2%	49.2%	49.2%	30.8%	30.8%	30.8%	30.8%	30.8%	
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	1.9	1.9	1.9	1.9	1.9	4.0	4.0	4.0	4.0	4.0	
Lost Time Adjust (s)		-1.6	-1.6	-1.6	-1.6		-3.0		-3.0	-3.0	
Total Lost Time (s)		4.0	4.0	4.0	4.0		4.0		4.0	4.0	
Lead/Lag	Lead	Lead		Lag	Lag						
Lead-Lag Optimize?	Yes	Yes		Yes	Yes						
Recall Mode	None	None	C-Max	C-Max	C-Max	None	None	None	None	None	
Act Effct Green (s)		91.6	91.6	73.9	73.9		20.4		20.4	20.4	
Actuated g/C Ratio		0.76	0.76	0.62	0.62		0.17		0.17	0.17	
v/c Ratio		0.67	0.20	0.00	0.64		0.07		0.51	0.31	
Control Delay		42.4	2.9	6.0	6.9		32.0		52.0	9.3	
Queue Delay		0.0	0.0	0.0	0.0		0.0		0.0	0.0	
Total Delay		42.4	2.9	6.0	6.9		32.0		52.0	9.3	
LOS		D	А	А	А		С		D	A	
Approach Delay			10.6		6.9		32.0		30.9		
Approach LOS			В		А		С		С		
Queue Length 50th (m)		22.6	9.7	0.0	20.5		2.9		23.8	0.0	
Queue Length 95th (m)		m47.7	m16.3	m0.0	95.2		8.1		36.4	12.9	
Internal Link Dist (m)			162.3		81.2		10.8		75.6		
Turn Bay Length (m)		70.0	10210	36.0	0112		1010		7010		
Base Capacity (vph)		354	3709	379	2955		392		344	476	
Starvation Cap Reductn		0	0	0	47		0		0	0	
Spillback Cap Reductn		0	0	0	0		0		0	0	
Storage Cap Reductn		0	0	0	0		0		0	0	
Reduced v/c Ratio		0.51	0.20	0.00	0.65		0.05		0.31	0.22	
Intersection Summary											
Cycle Length: 120											
Actuated Cycle Length: 120											
Offset: 3 (3%), Referenced to phase	2:EBTL and	6:WBTL, S	tart of Gree	n							
Natural Cycle: 90											
Control Type: Actuated-Coordinated											
Maximum v/c Ratio: 0.67											
ntersection Signal Delay: 9.9				In	tersection L(DS: A					
Intersection Capacity Utilization 95.6	%				U Level of S						
Analysis Period (min) 15				10							
m Volume for 95th percentile queu	e is metered	by upstrea	m signal.								
Splits and Phases: 3: Carling & W	estgate SC										

	•	₫ ™ ø4
83 s		37 s
⋬ _{ø5}	🛛 🕶 Ø6 (R)	≤ ¶ø8
24 s	59 s	37 s

Existing PM 4: Kirkwood & Carling WB

	4	+	•	Ť	Ļ	-	
Lane Group	WBL	WBT	NBL	NBT	SBT	SBR	
Lane Configurations	۲	₽₽₽	۲	1	<u>††</u>	1	
Traffic Volume (vph)	200	2185	227	545	481	410	
Future Volume (vph)	200	2185	227	545	481	410	
Lane Group Flow (vph)	190	2653	239	574	506	432	
Furn Type	Perm	NA	pm+pt	NA	NA	Perm	
Protected Phases		6	3	8	4		
Permitted Phases	6		8			4	
Detector Phase	6	6	3	8	4	4	
Switch Phase							
Vinimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0	
Minimum Split (s)	35.3	35.3	11.0	29.0	29.0	29.0	
Total Split (s)	67.0	67.0	20.0	53.0	33.0	33.0	
Total Split (%)	55.8%	55.8%	16.7%	44.2%	27.5%	27.5%	
Yellow Time (s)	3.7	3.7	3.3	3.3	3.3	3.3	
All-Red Time (s)	2.6	2.6	2.7	2.7	2.7	2.7	
Lost Time Adjust (s)	-2.3	-2.3	-2.0	-2.0	-2.0	-2.0	
Fotal Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	
_ead/Lag	1.0	1.0	Lead	1.0	Lag	Lag	
_ead-Lag Optimize?			Yes		Yes	Yes	
Recall Mode	C-Max	C-Max	None	Ped	Ped	Ped	
Act Effct Green (s)	63.0	63.0	49.0	49.0	29.5	29.5	
Actuated g/C Ratio	0.52	0.52	0.41	0.41	0.25	0.25	
//c Ratio	0.25	1.13	0.41	0.41	0.23	1.05	
Control Delay	16.7	91.6	34.2	39.9	43.9	93.6	
Queue Delay	0.0	0.0	0.0	5.2	43.7	0.0	
Total Delay	16.7	91.6	34.2	45.1	43.9	93.6	
_OS	В	71.0 F	С С	43.1 D	43.7 D	73.0 F	
Approach Delay	D	86.6	C	41.9	66.8	1	
Approach LOS		50.0 F		D	60.0 E		
Queue Length 50th (m)	27.3	~279.9	47.7	135.6	56.2	~96.0	
Queue Length 95th (m)	43.9	#309.3	66.0	177.9	74.2	#158.3	
nternal Link Dist (m)	43.7	113.3	00.0	144.7	73.8	#150.5	
Furn Bay Length (m)	40.0	113.3		144.7	75.0	22.0	
Base Capacity (vph)	762	2353	345	728	834	412	
Starvation Cap Reductn	0	2333	0	102	0.04	412	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.25	1.13	0.69	0.92	0.61	1.05	
	0.25	1.13	0.07	0.72	0.01	1.05	
Intersection Summary							
Cycle Length: 120							
Actuated Cycle Length: 120							
Offset: 39 (33%), Referenced to ph	hase 6:WBTL,	Start of Gre	en				
latural Cycle: 110							
Control Type: Actuated-Coordinate	ed						
Maximum v/c Ratio: 1.13					ersection L		
Maximum v/c Ratio: 1.13 ntersection Signal Delay: 74.6				IC	U Level of S	Service F	
Maximum v/c Ratio: 1.13 ntersection Signal Delay: 74.6 ntersection Capacity Utilization 95	5.8%			10			
Maximum v/c Ratio: 1.13 ntersection Signal Delay: 74.6 ntersection Capacity Utilization 95 Analysis Period (min) 15				10			
Maximum v/c Ratio: 1.13 htersection Signal Delay: 74.6 htersection Capacity Utilization 95 nalysis Period (min) 15 Volume exceeds capacity, que	eue is theoretic	ally infinite.		10			
Maximum v/c Ratio: 1.13 ntersection Signal Delay: 74.6 ntersection Capacity Utilization 95 Analysis Period (min) 15 - Volume exceeds capacity, que Queue shown is maximum afte	eue is theoretic r two cycles.	-		10			
Maximum v/c Ratio: 1.13 Intersection Signal Delay: 74.6 Intersection Capacity Utilization 95 Analysis Period (min) 15 - Volume exceeds capacity, que Queue shown is maximum afte # 95th percentile volume exceed	eue is theoretic r two cycles. Is capacity, qu	-	longer.	10			
Maximum v/c Ratio: 1.13 Intersection Signal Delay: 74.6 Intersection Capacity Utilization 95 Analysis Period (min) 15 - Volume exceeds capacity, que Queue shown is maximum afte	eue is theoretic r two cycles. Is capacity, qu	-	longer.				
Maximum V/c Ratio: 1.13 Intersection Signal Delay: 74.6 Intersection Capacity Utilization 95 Analysis Period (min) 15 - Volume exceeds capacity, que Queue shown is maximum afte 95th percentile volume exceed Queue shown is maximum afte	eue is theoretic r two cycles. Is capacity, qu r two cycles.	-	longer.				
Maximum V/c Ratio: 1.13 Intersection Signal Delay: 74.6 Intersection Capacity Utilization 95 Analysis Period (min) 15 - Volume exceeds capacity, que Queue shown is maximum afte 95th percentile volume exceed Queue shown is maximum afte	eue is theoretic r two cycles. Is capacity, qu	-	longer.				
Maximum V/c Ratio: 1.13 Intersection Signal Delay: 74.6 Intersection Capacity Utilization 95 Analysis Period (min) 15 - Volume exceeds capacity, que Queue shown is maximum afte 95th percentile volume exceed Queue shown is maximum afte	eue is theoretic r two cycles. Is capacity, qu r two cycles.	-	longer.			• 002	4 104
Maximum V/c Ratio: 1.13 Intersection Signal Delay: 74.6 Intersection Capacity Utilization 95 Analysis Period (min) 15 - Volume exceeds capacity, que Queue shown is maximum afte 95th percentile volume exceed Queue shown is maximum afte	eue is theoretic r two cycles. Is capacity, qu r two cycles.	-	longer.			▲ Ø3	Ø4
Maximum V/c Ratio: 1.13 Intersection Signal Delay: 74.6 Intersection Capacity Utilization 95 Analysis Period (min) 15 - Volume exceeds capacity, que Queue shown is maximum afte 95th percentile volume exceed Queue shown is maximum afte	eue is theoretic r two cycles. Is capacity, qu r two cycles.	-	longer.			↑ Ø3 20 s ↑ Ø8	∯ Ø4 33 s

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4			\$			ፋጉ			4î)-	
Traffic Volume (veh/h)	8	0	22	0	0	3	22	559	2	4	848	28
Future Volume (Veh/h)	8	0	22	0	0	3	22	559	2	4	848	28
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	8	0	23	0	0	3	23	588	2	4	893	29
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)											186	
pX, platoon unblocked												
vC, conflicting volume	1258	1552	461	1112	1565	295	922			590		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1258	1552	461	1112	1565	295	922			590		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	94	100	96	100	100	100	97			100		
cM capacity (veh/h)	123	109	547	152	106	701	736			982		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	31	3	317	296	450	476						
Volume Left	8	0	23	0	4	0						
Volume Right	23	3	0	2	0	29						
cSH	290	701	736	1700	982	1700						
Volume to Capacity	0.11	0.00	0.03	0.17	0.00	0.28						
Queue Length 95th (m)	2.7	0.1	0.7	0.0	0.1	0.0						
Control Delay (s)	18.9	10.2	1.1	0.0	0.1	0.0						
Lane LOS	С	В	А		А							
Approach Delay (s)	18.9	10.2	0.6		0.1							
Approach LOS	С	В										
Intersection Summary												
Average Delay			0.6									
Intersection Capacity Utilization			48.6%	ICL	J Level of S	ervice			А			
Analysis Period (min)			15									

Existing PM 5: Merivale & Thames



Total Area

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	Single Vehicle (other)	Single vehicle (Unattended vehicle)	Other	Total	
P.D. only	40	39	39	15	0	6	0	2	141	83%
Non-fatal injury	9	10	4	3	0	2	0	0	28	16%
Non reportable	1	0	0	0	0	0	0	0	1	1%
Total	50	49	43	18	0	8	0	2	170	100%
	#1 or 29%	#2 or 29%	#3 or 25%	#4 or 11%	#7 or 0%	#5 or 5%	#7 or 0%	#6 or 1%		_

CARLING AVE/KIRKWOOD AVE N

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2013-2015	64	43,304	1095	1.35

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	Single Vehicle (other)	Single vehicle (Unattended vehicle)	Other	Total	
P.D. only	12	18	19	4	0	2	0	1	56	88%
Non-fatal injury	2	3	1	1	0	1	0	0	8	13%
Non reportable	0	0	0	0	0	0	0	0	0	0%
Total	14	21	20	5	0	3	0	1	64	100%
	22%	33%	31%	8%	0%	5%	0%	2%		-

CARLING AVE/KIRKWOOD AVE S

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2013-2015	56	39,305	1095	1.30

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	Single Vehicle (other)	Single vehicle (Unattended vehicle)	Other	Total	
P.D. only	19	10	11	3	0	2	0	1	46	82%
Non-fatal injury	4	2	2	1	0	1	0	0	10	18%
Non reportable	0	0	0	0	0	0	0	0	0	0%
Total	23	12	13	4	0	3	0	1	56	100%
	41%	21%	23%	7%	0%	5%	0%	2%		

CARLING AVE/WESTGATE SC - E

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2013-2015	11	28,640	1095	0.35

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	Single Vehicle (other)	Single vehicle (Unattended vehicle)	Other	Total	
P.D. only	1	3	1	3	0	1	0	0	9	82%
Non-fatal injury	1	1	0	0	0	0	0	0	2	18%
Non reportable	0	0	0	0	0	0	0	0	0	0%
Total	2	4	1	3	0	1	0	0	11	100%
	18%	36%	9%	27%	0%	9%	0%	0%		_

CARLING AVE/MERIVALE RD

Voorc	Years Total #		Days	Collisions/MEV
Tears	Collisions	Veh Volume	Days	CONISIONS/IVIE V
2013-2015	36	33,814	1095	0.97

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	Single Vehicle (other)	Single vehicle (Unattended vehicle)	Other	Total	
P.D. only	7	8	7	5	0	0	0	0	27	75%
Non-fatal injury	2	4	1	1	0	0	0	0	8	22%
Non reportable	1	0	0	0	0	0	0	0	1	3%
Total	10	12	8	6	0	0	0	0	36	100%
	28%	33%	22%	17%	0%	0%	0%	0%		-



City Operations - Transportation Services Collision Details Report - Public Version

From: January 1, 2014 To: December 31, 2015

Location: ALPINE	E AVE @ CAR	RLING AVE							
Traffic Control: Tra	ffic signal						Total Co	ollisions: 1	
Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2015-Jun-10, Wed,07:20	Clear	Angle	P.D. only	Dry	South	Going ahead	Pick-up truck	Other motor vehicle	
					West	Turning right	Automobile, station wagon	Other motor vehicle	
Location: CARLI	NG AVE @ KI	RKWOOD AVE S							
Traffic Control: Tra	-						Total Co	ollisions: 44	
Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2014-Jan-07, Tue,05:56	Clear	Sideswipe	P.D. only	Wet	East	Turning left	Snow plow	Other motor vehicle	
					East	Stopped	Truck - closed	Other motor vehicle	
2014-Feb-01, Sat,17:30	Snow	Rear end	P.D. only	Loose snow	South	Slowing or stopping	g Pick-up truck	Other motor vehicle	
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2014-Mar-01, Sat,08:27	Clear	Turning movement	P.D. only	Slush	South	Turning left	Automobile, station wagon	Other motor vehicle	
					North	Going ahead	Passenger van	Other motor vehicle	
2014-Mar-31, Mon,08:20	Clear	Sideswipe	P.D. only	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle	
					North	Going ahead	Automobile, station wagon	Other motor vehicle	

2014-Mar-04, Tue,12:20	Unknown	Rear end	Non-fatal injury	Unknown	South South		Automobile, station wagon Passenger van	Other motor vehicle Other motor
					oouun	otoppod		vehicle
2014-May-13, Tue,12:08	Clear	Sideswipe	P.D. only	Dry	East	Overtaking	Unknown	Other motor vehicle
					East	Turning left	Pick-up truck	Other motor vehicle
2014-May-01, Thu,18:30	Clear	Turning movement	P.D. only	Dry	East	Turning left	Pick-up truck	Other motor vehicle
					East	Turning left	Pick-up truck	Other motor vehicle
2014-May-22, Thu,15:00	Clear	Sideswipe	P.D. only	Dry	East		Automobile, station wagon	Other motor vehicle
					East		Automobile, station wagon	Other motor vehicle
2014-May-30, Fri,13:50	Clear	Rear end	P.D. only	Dry	East	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					East	Slowing or stopping	Automobile, station wagon	Other motor vehicle
2014-May-29, Thu,15:37	Clear	Rear end	P.D. only	Dry	East	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					East	Stopped	Pick-up truck	Other motor vehicle
2014-Jun-19, Thu, 11:37	Clear	Turning movement	P.D. only	Dry	South		Automobile, station wagon	Other motor vehicle
					North	Going ahead	Passenger van	Other motor vehicle

2014-Jun-28, Sat,07:00	Clear	Sideswipe	P.D. only	Dry	East	Changing lanes	Pick-up truck	Other motor vehicle
					East	Stopped	Pick-up truck	Other motor vehicle
2014-Sep-25, Thu,08:50	Clear	Turning movement	P.D. only	Dry	South	Turning left	Automobile, station wagon	Other motor vehicle
					North	Going ahead	Pick-up truck	Other motor vehicle
2014-Sep-02, Tue,20:00	Rain	Rear end	P.D. only	Wet	South	Slowing or stopping	Automobilo	Other motor
2014-3ep-02, 1ue,20.00	Nain	Redi ellu	F.D. Only	Wei	South		station wagon	vehicle
					South	Stopped	Passenger van	Other motor vehicle
				_	•			
2014-Sep-08, Mon,11:35	Clear	Sideswipe	P.D. only	Dry	South	Going ahead	Pick-up truck	Other motor vehicle
					South	Going ahead	Truck - closed	Other motor vehicle
2014-Dec-05, Fri,20:16	Clear	Angle	P.D. only	Dry	East	Turning right	Automobile,	Other motor
2014-200-00,111,20.10	Olda	Angle	T.D. Only	Diy	Last		station wagon	vehicle
					North	Going ahead	Pick-up truck	Other motor vehicle
2014-Oct-20, Mon,11:15	Clear	Angle	P.D. only	Dry	East		Automobile, station wagon	Other motor vehicle
					South	Going ahead	Automobile, station wagon	Other motor vehicle
2015 Jan 22 Thu 17-54	Clear	Turning mayomost		Day	South	Turning loft	Diak up truck	Other meter
2015-Jan-22, Thu,17:54	Clear	Turning movement	F.D. OHIY	Dry	South	Turning left	Pick-up truck	Other motor vehicle
					North	Going ahead	Automobile, station wagon	Other motor vehicle
2015 May 09 Eri 12:26	Clear			Dny	South	Turning loft	Automobile	Other motor
2015-May-08, Fri,13:36	Clear	Turning movement	P.D. only	Dry	South	Turning left	Automobile, station wagon	vehicle

					North	•	Automobile, station wagon	Other motor vehicle
2014-Dec-23, Tue,13:15	Rain	Rear end	P.D. only	Wet	South	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					South	Slowing or stopping	Pick-up truck	Other motor vehicle
2014-Dec-22, Mon,14:30	Clear	Rear end	P.D. only	Dry	East	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					East	Slowing or stopping	Automobile, station wagon	Other motor vehicle
2015-Feb-14, Sat,09:23	Snow	Rear end	P.D. only	Loose snow	West	Going ahead	Automobile, station wagon	Other motor vehicle
					West	•	Automobile, station wagon	Other motor vehicle
2015-Jan-03, Sat,18:06	Snow	Turning movement	P.D. only	Loose snow	South		Automobile, station wagon	Other motor vehicle
					North		Automobile, station wagon	Other motor vehicle
2014-Apr-09, Wed,18:35	Clear	Turning movement	Non-fatal injury	Dry	South		Automobile, station wagon	Other motor vehicle
					North	Going ahead	Pick-up truck	Other motor vehicle
2015-Jan-16, Fri,23:07	Clear	Turning movement	P.D. only	Wet	South		Automobile, station wagon	Other motor vehicle
					North		Automobile, station wagon	Other motor vehicle
2015-Feb-05, Thu,15:36	Clear	Other	P.D. only	Dry	South		Automobile, station wagon	Other motor vehicle
					South	Turning left	Truck - closed	Other motor vehicle

2015-Apr-09, Thu,10:55	Clear	Turning movement	Non-fatal injury	Dry	South	Turning left	Automobile, station wagon	Other motor vehicle
					North	Going ahead	Automobile, station wagon	Other motor vehicle
2015-Jan-14, Wed,15:15	Clear	Rear end	P.D. only	Dry	East	Changing lanes	Pick-up truck	Other motor vehicle
					East	Stopped	Automobile, station wagon	Other motor vehicle
2015-Mar-16, Mon,15:02	Clear	Rear end	P.D. only	Dry	East	Going ahead	Pick-up truck	Other motor vehicle
					East	Stopped	Pick-up truck	Other motor vehicle
2015-Feb-08, Sun,08:01	Snow	SMV other	P.D. only	Ice	East	Turning left	Automobile, station wagon	Pole (utility, power)
2014-Sep-24, Wed,08:30	Clear	Turning movement	P.D. only	Dry	East	Turning left	Truck and trailer	Other motor vehicle
					East	Going ahead	Passenger van	Other motor vehicle
2014-Dec-18, Thu,06:15	Snow	Rear end	P.D. only	Wet	South	Going ahead	Automobile, station wagon	Other motor vehicle
					South	Stopped	Pick-up truck	Other motor vehicle
2015-Jan-12, Mon,18:30	Snow	Rear end	P.D. only	Loose snow	North	Going ahead	Automobile, station wagon	Other motor vehicle
					North	Stopped	Automobile, station wagon	Other motor vehicle
2015-May-05, Tue,17:27	Clear	Turning movement	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle

					East	•	Automobile, station wagon	Other motor vehicle
2015-Feb-23, Mon,10:50	Clear	Rear end	P.D. only	Wet	East	Turning right	Tow truck	Other motor vehicle
					East		Automobile, station wagon	Other motor vehicle
2015-Aug-16, Sun,20:14	Clear	Angle	P.D. only	Dry	South		Automobile, station wagon	Other motor vehicle
					East	•	Automobile, station wagon	Other motor vehicle
2015-Jul-29, Wed,15:10	Clear	Sideswipe	P.D. only	Dry	North		Automobile, station wagon	Other motor vehicle
					North		Municipal transit bus	Other motor vehicle
2015-Aug-30, Sun,16:14	Clear	Rear end	P.D. only	Dry	North	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					North		Automobile, station wagon	Other motor vehicle
2015-Oct-14, Wed,18:13	Clear	Rear end	P.D. only	Dry	East		Automobile, station wagon	Other motor vehicle
					East	v	Automobile, station wagon	Other motor vehicle
2015-Oct-12, Mon,18:39	Clear	Rear end	Non-fatal injury	Dry	South	Turning left	Passenger van	Other motor vehicle
					South	•	Automobile, station wagon	Other motor vehicle
2015-Jul-25, Sat,12:32	Clear	Sideswipe	P.D. only	Dry	East	Changing lanes	Pick-up truck	Other motor vehicle
					East		Automobile, station wagon	Other motor vehicle

2015-Dec-17, Thu,07:42	Rain	Rear end	P.D. only	Wet	East		Automobile, station wagon	Other motor vehicle
					East	Turning left	Automobile, station wagon	Other motor vehicle
2015-Dec-23, Wed, 19:57	Rain	Rear end	P.D. only	Wet	East	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					East	Stopped	Automobile, station wagon	Other motor vehicle
					East	Stopped	Passenger van	Other motor vehicle
2015-Oct-30, Fri,16:59	Clear	Rear end	Non-fatal injury	Dry	East	•	Automobile, station wagon	Other motor vehicle
					East	•	Automobile, station wagon	Other motor vehicle
					East	Turning left	Automobile, station wagon	Other motor vehicle

Location: CARLING AVE @ MERIVALE RD

Traffic Control: Tra	ffic signal				Total Collisions: 23				
Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuve	r Vehicle type	First Event	No. Ped
2014-Jan-15, Wed,07:31	Clear	Turning movement	Non-fatal injury	Dry	West	Turning left	Automobile, station wagon	Other motor vehicle	
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2014-Feb-14, Fri,10:23	Clear	Turning movement	P.D. only	Loose snow	West	Turning left	Automobile, station wagon	Other motor vehicle	
					East	Going ahead	Passenger van	Other motor vehicle	
2014-Feb-13, Thu,09:15	Clear	Rear end	P.D. only	Dry	East	Going ahead	Passenger van	Other motor vehicle	

					East	Turning right	Automobile, station wagon	Other motor vehicle
2014-Apr-06, Sun,16:04	Clear	Angle	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle
					South	Going ahead	Automobile, station wagon	Other motor vehicle
2014-Feb-28, Fri,16:57	Clear	Rear end	P.D. only	Dry	West	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					West	Stopped	Pick-up truck	Other motor vehicle
2014-May-14, Wed,16:15	Clear	Rear end	P.D. only	Dry	South	Turning right	Pick-up truck	Other motor vehicle
					South	Turning right	Automobile, station wagon	Other motor vehicle
2014-Aug-05, Tue,15:39	Clear	Angle	Non-fatal injury	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle
					South	Going ahead	Passenger van	Other motor vehicle
2014-Oct-03, Fri,13:08	Clear	Rear end	P.D. only	Dry	East	Turning right	Automobile, station wagon	Other motor vehicle
					East	Turning right	Truck - closed	Other motor vehicle
2014-Nov-20, Thu,17:31	Clear	Rear end	P.D. only	Wet	South	Going ahead	Pick-up truck	Other motor vehicle
					South	Stopped	Automobile, station wagon	Other motor vehicle
2014-Oct-08, Wed,10:51	Clear	Turning movement	P.D. only	Dry	East		Automobile, station wagon	Other motor vehicle
					West	Turning left	Automobile, station wagon	Other motor vehicle

2014-Aug-14, Thu,15:00	Rain	Turning movement	P.D. only	Wet	West	Turning right	Automobile, station wagon	Other motor vehicle
					East	Turning left	Automobile, station wagon	Other motor vehicle
2015-Apr-24, Fri,22:09	Clear	Rear end	P.D. only	Dry	West	Slowing or stopping	Pick-up truck	Other motor vehicle
					West	Stopped	Pick-up truck	Other motor vehicle
2015-Feb-20, Fri,13:24	Clear	Sideswipe	P.D. only	Dry	North	Changing lanes	Automobile, station wagon	Other motor vehicle
					North	Turning left	Automobile, station wagon	Other motor vehicle
2015-Jan-05, Mon,14:09	Clear	Rear end	P.D. only	Dry	East	Unknown	Unknown	Other motor vehicle
					East	Stopped	Automobile, station wagon	Other motor vehicle
2015-Mar-02, Mon,17:53	Clear	Turning movement	Non-fatal injury	Dry	West	Turning left	Automobile, station wagon	Other motor vehicle
					East	Going ahead	Automobile, station wagon	Other motor vehicle
2015-Jul-19, Sun,17:10	Clear	Turning movement	P.D. only	Dry	East	Turning right	Automobile, station wagon	Other motor vehicle
					West	Turning left	Automobile, station wagon	Other motor vehicle
2015-Feb-03, Tue,16:12	Snow	Angle	P.D. only	Loose snow	East	Going ahead	Automobile, station wagon	Other motor vehicle
					South	Turning left	Automobile, station wagon	Other motor vehicle

2015-Apr-07, Tue,13:30	Clear	Sideswipe	P.D. only	Dry	West	Changing lanes	Automobile, station wagon	Other motor vehicle
					West	Turning left	Passenger van	Other motor vehicle
2015-Apr-04, Sat,23:40	Clear	Angle	P.D. only	Dry	North	Going ahead	Police vehicle	Other motor vehicle
					West	Going ahead	Automobile, station wagon	Other motor vehicle
2015-May-27, Wed,16:41	Clear	Angle	P.D. only	Dry	West	Going ahead	Pick-up truck	Other motor vehicle
					South	Going ahead	Automobile, station wagon	Other motor vehicle
2015-Feb-17, Tue,13:36	Clear	Sideswipe	Non-fatal injury	Dry	West	Changing lanes	Automobile, station wagon	Other motor vehicle
					West	Going ahead	Passenger van	Other motor vehicle
					West	Stopped	Automobile, station wagon	Other motor vehicle
2015-May-26, Tue,15:00	Clear	Sideswipe	P.D. only	Dry	East	Changing lanes	Automobile, station wagon	Other motor vehicle
					East	Going ahead	Automobile, station wagon	Other motor vehicle
2015-Dec-09, Wed,20:15	Clear	Sideswipe	P.D. only	Dry	West	Changing lanes	Automobile, station wagon	Other motor vehicle
					West	Going ahead	Automobile, station wagon	Other motor vehicle

Location: CARLING AVE @ WESTGATE SC E

Traffic Control: T	affic signal				Total Collisions: 6					
Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver Vehicle type	First Event	No. Ped		

2014-Jun-02, Mon,09:21	Clear	Rear end	Non-fatal injury	Dry	East	Turning left	Pick-up truck	Other motor vehicle
					East	Turning left	Automobile, station wagon	Other motor vehicle
					East	Turning left	Pick-up truck	Other motor vehicle
2015-Feb-04, Wed,15:15	Snow	Angle	P.D. only	Loose snow	West	Going ahead	Automobile, station wagon	Skidding/sliding
					South	Turning left	Automobile, station wagon	Other motor vehicle
2015-May-12, Tue,10:09	Clear	Angle	P.D. only	Dry	South	Turning right	Automobile, station wagon	Other motor vehicle
					West	Stopped	Municipal transit bus	Other motor vehicle
2015-Sep-24, Thu,16:40	Clear	Angle	P.D. only	Dry	East	Going ahead	Passenger van	Other motor vehicle
					South	Turning left	Automobile, station wagon	Other motor vehicle
2015-May-20, Wed,10:08	Clear	Turning movement	P.D. only	Dry	East	Turning left	Passenger van	Other motor vehicle
					West	Going ahead	Automobile, station wagon	Other motor vehicle
2015-Jan-03, Sat,19:34	Snow	Sideswipe	P.D. only	Packed snow	South	Turning right	Municipal transit bus	Other motor vehicle
					South	Turning right		Other motor vehicle

Location: KIRKWOOD AVE N @ CARLING AVE

Traffic Control: Tr	raffic signal				Total Collisions: 39						
Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver Vehicle type	First Event	No. Ped			

2014-Jan-31, Fri,11:52	Clear	Turning movement	P.D. only	Dry	West	Turning left	Pick-up truck	Other motor vehicle
					West	Going ahead	Passenger van	Other motor vehicle
2014-Mar-27, Thu,14:57	Clear	Sideswipe	Non-fatal injury	Dry	West	Turning left	Pick-up truck	Other motor vehicle
					West	Turning left	Pick-up truck	Other motor vehicle
2014-Feb-27, Thu,10:47	Snow	Turning movement	P.D. only	Wet	West	Turning left	Automobile, station wagon	Other motor vehicle
					West	Going ahead	Truck - closed	Other motor vehicle
2014-Apr-28, Mon,14:37	Clear	Angle	P.D. only	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle
					West	Turning left	Automobile, station wagon	Other motor vehicle
2014-Apr-19, Sat,14:15	Clear	Turning movement	P.D. only	Dry	West	Turning left	Automobile, station wagon	Other motor vehicle
					West	Going ahead	Automobile, station wagon	Other motor vehicle
2014-May-21, Wed,11:39	Clear	Turning movement	P.D. only	Dry	West	Turning left	Pick-up truck	Other motor vehicle
					West	Going ahead	Automobile, station wagon	Other motor vehicle
2014-May-16, Fri,17:50	Clear	Sideswipe	P.D. only	Dry	West	Changing lanes	Pick-up truck	Other motor vehicle
					West	Going ahead	Automobile, station wagon	Other motor vehicle
2014-Jun-16, Mon,11:00	Clear	Sideswipe	P.D. only	Dry	West	Going ahead	Delivery van	Other motor vehicle

					West	Stopped	Pick-up truck	Other motor vehicle
2014-Jun-27, Fri,11:00	Clear	Sideswipe	P.D. only	Dry	West	Turning left	Unknown	Other motor vehicle
					West	Stopped	Automobile, station wagon	Other motor vehicle
2014-Jun-18, Wed,10:08	Clear	Sideswipe	P.D. only	Dry	West	Changing lanes	Passenger van	Other motor vehicle
					West	Going ahead	Passenger van	Other motor vehicle
2014-Feb-25, Tue,14:07	Clear	Turning movement	Non-fatal injury	Dry	North	Turning left	Automobile, station wagon	Other motor vehicle
					South	Going ahead	Pick-up truck	Other motor vehicle
2014-Nov-02, Sun,13:15	Clear	Sideswipe	P.D. only	Dry	West	Changing lanes	Automobile, station wagon	Other motor vehicle
					West	Turning right	Truck and trailer	Other motor vehicle
2014-Nov-02, Sun,13:30	Clear	Turning movement	P.D. only	Dry	West	Going ahead	Pick-up truck	Other motor vehicle
					West	Turning left	Automobile, station wagon	Other motor vehicle
2014-Sep-07, Sun,19:57	Clear	Angle	P.D. only	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle
					West	Going ahead	Automobile, station wagon	Other motor vehicle
2015-Jan-13, Tue,09:12	Clear	Sideswipe	P.D. only	Loose snow	West	Changing lanes	Automobile, station wagon	Other motor vehicle
					West	Going ahead	Automobile, station wagon	Other motor vehicle

2015-Jan-28, Wed,17:30	Clear	Turning movement	P.D. only	Dry	West	Turning left	Automobile, station wagon	Other motor vehicle
					West	Going ahead	Pick-up truck	Other motor vehicle
2014-Oct-29, Wed,11:30	Clear	Sideswipe	P.D. only	Dry	West	Changing lanes	Passenger van	Other motor vehicle
					West	Going ahead	Automobile, station wagon	Other motor vehicle
2014-Dec-05, Fri,15:37	Clear	Turning movement	Non-fatal injury	Dry	South	Turning left	Automobile, station wagon	Other motor vehicle
					South	Going ahead	Passenger van	Other motor vehicle
2015-Mar-03, Tue,10:32	Clear	Sideswipe	P.D. only	Dry	West	Changing lanes	Passenger van	Other motor vehicle
					West	Turning left	Truck - closed	Other motor vehicle
2015-Apr-02, Thu,14:52	Clear	Turning movement	P.D. only	Dry	West	Turning left	Ambulance	Other motor vehicle
					West	Going ahead	Pick-up truck	Other motor vehicle
2015-Jul-07, Tue,18:11	Clear	Turning movement	P.D. only	Dry	West	Turning left	Passenger van	Other motor vehicle
					West	Going ahead	Passenger van	Other motor vehicle
2015-Jun-29, Mon,10:29	Rain	Sideswipe	P.D. only	Wet	West	Turning left	Truck and trailer	Other motor vehicle
					West	Turning left	Passenger van	Other motor vehicle

2015-Jun-30, Tue,21:59	Clear	Sideswipe	P.D. only	Dry	North	Turning left	Unknown	Other motor vehicle
					North	•	Automobile, station wagon	Other motor vehicle
2015-Jan-06, Tue,12:30	Clear	Rear end	P.D. only	Dry	West	Changing lanes	Unknown	Other motor vehicle
					West	Turning left	Passenger van	Other motor vehicle
2014-Dec-19, Fri,13:40	Clear	Rear end	P.D. only	Dry	West		Automobile, station wagon	Other motor vehicle
					West	Going ahead	Truck - dump	Other motor vehicle
2014-Dec-31, Wed,10:59	Clear	SMV other	P.D. only	Dry	North		Automobile, station wagon	Animal - domestic
2015-Jan-13, Tue,06:05	Clear	Turning movement	P.D. only	Dry	West	Turning left	Automobile, station wagon	Other motor vehicle
					West	Going ahead	Pick-up truck	Other motor vehicle
2015-Feb-16, Mon,17:34	Clear	Angle	Non-fatal injury	Wet	North	Going ahead	Passenger van	Other motor vehicle
					East	Going ahead	Automobile, station wagon	Other motor vehicle
2015-Feb-27, Fri,13:17	Clear	Rear end	P.D. only	Wet	South	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					South	Stopped	Pick-up truck	Other motor vehicle
					South	Stopped	Pick-up truck	Other motor vehicle
2015-May-14, Thu,14:22	Clear	Angle	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle

					South	Going ahead	Automobile, station wagon	Other motor vehicle
2015-May-28, Thu,08:10	Clear	SMV other	P.D. only	Wet	North	Going ahead	Automobile, station wagon	Curb
2015-Aug-09, Sun,21:30	Clear	Turning movement	P.D. only	Dry	West	Going ahead	Unknown	Other motor vehicle
					West	Turning left	Automobile, station wagon	Other motor vehicle
2015-Dec-21, Mon,11:24	Freezing Rain	Sideswipe	P.D. only	Slush	West	Changing lanes	Passenger van	Other motor vehicle
					West	Going ahead	Truck - closed	Other motor vehicle
2015-Nov-13, Fri,20:03	Rain	Turning movement	P.D. only	Wet	West	Turning left	Pick-up truck	Other motor vehicle
					West	Going ahead	Pick-up truck	Other motor vehicle
2015-Oct-09, Fri,14:38	Clear	Rear end	P.D. only	Wet	West	Going ahead	Pick-up truck	Other motor vehicle
					West	Turning right	Automobile, station wagon	Other motor vehicle
2015-Dec-17, Thu,17:30	Clear	Sideswipe	P.D. only	Dry	West	Changing lanes	Automobile, station wagon	Other motor vehicle
					West	Going ahead	Automobile, station wagon	Other motor vehicle
2015-Nov-24, Tue,10:20	Clear	Turning movement	P.D. only	Dry	West	Turning left	Automobile, station wagon	Other motor vehicle
					West	Going ahead	Automobile, station wagon	Other motor vehicle

2015-Nov-25, Wed,18:12	Clear	Rear end	P.D. only	Dry	West	Unknown	Unknown	Other motor vehicle
					West	Stopped	Automobile, station wagon	Other motor vehicle
2015-Dec-14, Mon,18:40	Clear	Turning movement	P.D. only	Wet	West	Turning left	Pick-up truck	Other motor vehicle
					West	Going ahead	Automobile, station wagon	Other motor vehicle



City Operations - Transportation Services Collision Details Report - Public Version

From: January 1, 2014 To: December 31, 2015

Location: MERIV	ALE RD @ TH	IAMES ST							
Traffic Control: Sto	p sign						Total C	ollisions: 1	
Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuve	er Vehicle type	First Event	No. Ped
2015-Apr-13, Mon,11:07	Clear	Sideswipe	P.D. only	Dry	South	Changing lanes	Pick-up truck	Other motor vehicle	
					South	Going ahead	Automobile, station wagon	Other motor vehicle	

OnTRAC Reporting System

CARLING AVE & KIRKWOOD AVE N

Former Municip	pality: Ottawa	Traffic Control: Traffic	signal		Numb	er of Collisions: 25			
	DATE DAY TIME ENV	IMPACT LIGHT TYPE	CLASS	DIR	SURFACE COND'N	VEHICLE MANOEUVRE	VEHICLE TYPE	FIRST EVENT	No. PED
1	2013-01-21 Mo 20:45 Clear	Dark Turning	Non-fatal	V1 W V2 W	Dry Dry	Turning left Going ahead	Automobile, station Automobile, station	Other motor vehicle Other motor vehicle	0
2	2013-01-23 We 14:11 Clear	Daylight Turning	P.D. only	V1 W V2 W	Dry Dry	Turning left Going ahead	Automobile, station Automobile, station	Other motor vehicle Other motor vehicle	0
3	2013-01-24 Thu 08:17 Clear	Daylight Rear end	P.D. only	V1 W V2 W	lce lce	Slowing or Stopped	Automobile, station Automobile, station	Other motor vehicle Other motor vehicle	0
4	2013-03-19 Tue 17:15 Clear	Daylight Other	P.D. only		Dry Dry	Reversing Stopped	Automobile, station Pick-up truck	Other motor vehicle Other motor vehicle	0
	TS: EXACT LOCATION UNKNO								
5	2013-05-30 Thu 16:27 Clear	Daylight Sideswipe	P.D. only	V1 S V2 S	Dry Dry	Merging Going ahead	Automobile, station Pick-up truck	Other motor vehicle Other motor vehicle	0
6	2013-06-12 We 18:30 Clear	Daylight Rear end	P.D. only	V1 W V2 W	Dry Dry	Going ahead Stopped	Automobile, station Automobile, station	Other motor vehicle Other motor vehicle	0
7	2013-06-14 Fri 18:10 Clear	Daylight Turning	P.D. only		Dry Dry	Turning left Going ahead	Passenger van Automobile, station	Other motor vehicle Other motor vehicle	0
8	2013-06-24 Mo 12:29 Clear	Daylight Rear end	P.D. only	V1 W V2 W	Dry Dry	Turning left Stopped	Passenger van Pick-up truck	Other motor vehicle Other motor vehicle	0
9	2013-07-10 We 18:56 Clear	Daylight Turning	P.D. only	V1 E V2 E	Dry Dry	Turning left Going ahead	Pick-up truck Pick-up truck	Other motor vehicle Other motor vehicle	0
10	2013-07-17 We 10:00 Clear	Daylight Sideswipe	P.D. only	V1 W V2 W	Dry Dry	Changing lanes Turning left	Unknown Pick-up truck	Other motor vehicle Other motor vehicle	0
11	2013-07-29 Mo 15:20 Clear	Daylight Rear end	P.D. only		Dry Dry Dry	Going ahead Stopped	Automobile, station Automobile, station	Other motor vehicle Other motor vehicle	0
12	2013-08-07 We 17:29 Rain	Daylight Rear end	P.D. only	V1 S V2 S	Wet Wet	Turning right Turning right	Automobile, station Automobile, station	Other motor vehicle Other motor vehicle	0
13	2013-08-19 Mo 18:03 Clear	Daylight Turning	P.D. only	-	Dry Dry	Turning right Going ahead	Automobile, station Municipal transit bus	Other motor vehicle Other motor vehicle	0

(Note: Time of Day = "00:00" represents unknown collision time **Thursday, March 23, 2017**

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OnTRAC Reporting System

FROM: 2013-01-01 TO: 2014-01-01

14	2013-08-21 We 17:*	15 Clear	Daylight F	Rear end	Non-fatal	V1 V2		Dry Dry	Going ahead Stopped	Pick-up truck Pick-up truck	Other motor vehicle Other motor vehicle	0
15	2013-09-06 Fri 08:	50 Clear	Daylight S	Sideswipe	P.D. only	V1 V2		Dry Dry	Going ahead Going ahead	Unknown Automobile, station	Other motor vehicle Other motor vehicle	0
16	2013-09-11 We 14:4	45 Clear	Daylight S	Sideswipe	P.D. only		W	Dry Dry	Changing lanes Going ahead	Pick-up truck Automobile, station	Other motor vehicle Other motor vehicle	0
17	2013-10-02 We 11:7	11 Clear	Daylight S	Single vehicle	Non-fatal			Dry	Turning left	Municipal transit bus	Other Moveable	0
18	2013-10-03 Thu 12:0	01 Clear	Daylight S	Sideswipe	P.D. only	V1 V2		Dry Dry	Changing lanes Going ahead	Automobile, station Pick-up truck	Other motor vehicle Other motor vehicle	0
19	2013-10-20 Sun 15:2	22 Clear	Daylight F	Rear end	P.D. only	V1 V2		Dry Dry	Turning left Going ahead	Automobile, station Pick-up truck	Other motor vehicle Other motor vehicle	0
20	2013-10-27 Sun 17:4	46 Clear	Daylight S	Sideswipe	P.D. only	V1 V2		Dry Dry	Merging Going ahead	Truck - closed Passenger van	Other motor vehicle Other motor vehicle	0
21	2013-11-05 Tue 17:4	44 Clear	Dark S	Sideswipe	P.D. only		W	Dry Dry Dry	Changing lanes Going ahead	Pick-up truck Pick-up truck	Other motor vehicle Other motor vehicle	0
22	2013-11-05 Tue 17:4	40 Clear	Dark 1	Turning	P.D. only	V1 V2		Dry Dry	Going ahead Turning left	Unknown Automobile, station	Other motor vehicle Other motor vehicle	0
23	2013-12-18 We 13:0	00 Clear	Daylight F	Rear end	P.D. only	V1 V2		Slush Slush	Going ahead Slowing or	Automobile, station Automobile, station	Other motor vehicle Other motor vehicle	0
24	2013-12-19 Thu 13:2	20 Clear	Daylight F	Rear end	Non-fatal	V1 V2		Wet Wet	Turning right Turning right	Pick-up truck Automobile, station	Other motor vehicle Other motor vehicle	0
25	2013-12-20 Fri 06:4	48 Snow	Dark A	Angle	P.D. only	V1 V2		Loose snow Loose snow	Going ahead Going ahead	Automobile, station Pick-up truck	Other motor vehicle Other motor vehicle	0

(Note: Time of Day = "00:00" represents unknown collision time **Thursday, March 23, 2017**

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OnTRAC Reporting System

CARLING AVE & KIRKWOOD AVE S

Former Munici	ipality: Ottawa	Traffic Control: Traffic signal		Number of Collisions: 12	
	DATE DAY TIME ENV	IMPACT LIGHT TYPE CLASS		FACE VEHICLE ND'N MANOEUVRE VEHICLE TYPE	FIRST EVENT PED
26	2013-01-07 Mo 09:50 Clear	Daylight Sideswipe P.D. on	ly V1 E Wet V2 E Wet	Changing lanes Truck - dump Going ahead Automobile, station	Other motor vehicle 0 Other motor vehicle
27	2013-01-16 We 13:50 Clear	Daylight Angle Non-fat	al V1 E Dry V2 S Dry	Going ahead Automobile, station Going ahead Automobile, station	Other motor vehicle 0 Other motor vehicle
28	2013-01-25 Fri 08:11 Clear	Daylight Sideswipe P.D. on	ly V1 E Ice V2 E Dry	Changing lanes Automobile, station Going ahead Truck - dump	Other motor vehicle 0 Other motor vehicle
29	2013-04-27 Sat 16:10 Clear	Daylight Rear end Non-fat	al V1 N Dry V2 N Dry	Turning rightAutomobile, stationTurning rightAutomobile, station	Other motor vehicle 0 Other motor vehicle
30	2013-05-03 Fri 15:12 Clear	Daylight Rear end P.D. on	ly V1 E Dry V2 E Dry	Slowing or Automobile, station Stopped Delivery van	Other motor vehicle 0 Other motor vehicle
31	2013-05-07 Tue 11:08 Clear	Daylight Sideswipe Non-fat	al V1 E Dry V2 E Dry	Turning leftPick-up truckTurning leftMotorcycle	Other motor vehicle 0 Other motor vehicle
32	2013-06-09 Sun 20:48 Clear	Dusk Single vehicle P.D. on	ly V1 S Dry	Turning left Automobile, station	Curb 0
33	2013-09-12 Thu 09:06 Clear	Daylight Sideswipe P.D. on	ly V1 E Dry V2 E Dry	Changing lanes Automobile, station Going ahead Automobile, station	Other motor vehicle 0 Other motor vehicle
34	2013-10-14 Mo 18:36 Clear	Dark Sideswipe Non-fat	al V1 E Dry V2 E Dry	Going ahead Pick-up truck Stopped Automobile, station	Other motor vehicle 0 Other motor vehicle
35	2013-10-30 We 15:09 Clear	Daylight Single vehicle Non-fat	,	Going ahead Bicycle	Curb 0
36	2013-11-11 Mo 13:33 Rain	Daylight Rear end P.D. on	ly V1 N Wet V2 N Wet	Turning rightPolice vehicleTurning rightAutomobile, station	Other motor vehicle 0 Other motor vehicle
37	2013-12-13 Fri 16:30 Clear	Dusk Rear end P.D. on	ly V1 E Dry V2 E Dry	Changing lanes Automobile, station Stopped Automobile, station	Other motor vehicle 0 Other motor vehicle

CARLING AVE & MERIVALE RD

Former Muni	cipality: Ottawa	Traffic Control: Traffic	signal	Numb	er of Collisions: 13	i i		
	DATE DAY TIME EN	IMPACT V LIGHT TYPE	CLASS DIR	SURFACE COND'N	VEHICLE MANOEUVRE	VEHICLE TYPE	FIRST EVENT	No. PED
38	2013-01-02 We 17:06 Sno	w Dusk Turning	Non-fatal V1 E V2 W		Going ahead Turning left	Automobile, station Passenger van	Other motor vehicle Other motor vehicle	0

OnTRAC Reporting System

FROM: 2013-01-01 TO: 2014-01-01

39	2013-03-04 Mo 09:14 Clear	Daylight Turning	P.D. only	V1 E V2 E	Dry Dry	Going ahead Making U-Turn	Automobile, station Ambulance	Other motor vehicle Other motor vehicle	0
40	2013-06-22 Sat 15:58 Rain	Daylight Rear end	Non-fatal	V1 N V2 N	Wet Wet	Turning right Turning right	Automobile, station Automobile, station	Other motor vehicle Other motor vehicle	0
41	2013-06-24 Mo 13:53 Clear	Daylight Turning	Non-fatal	V1 W V2 W	Dry Dry	Turning left Going ahead	Bicycle Automobile, station	Other motor vehicle Cyclist	0
42	2013-07-09 Tue 06:44 Clear	Daylight Angle	P.D. only	V1 W V2 S	Dry Dry	Going ahead Going ahead	Automobile, station Pick-up truck	Other motor vehicle Other motor vehicle	0
43	2013-07-10 We 17:15 Clear	Daylight Rear end	Non	V1 N V2 N	Dry Dry	Going ahead Stopped	Passenger van Pick-up truck	Other motor vehicle Other motor vehicle	0
44	2013-08-27 Tue 16:30 Clear	Daylight Sideswipe	P.D. only	V1 W V2 W	Dry Dry	Changing lanes Going ahead	Automobile, station Automobile, station	Other motor vehicle Other motor vehicle	0
45	2013-10-09 We 17:28 Clear	Daylight Rear end	Non-fatal	V1 E V2 E	Dry Dry	Going ahead Stopped	Automobile, station Pick-up truck	Other motor vehicle Other motor vehicle	0
46	2013-10-09 We 08:06 Clear	Daylight Sideswipe	P.D. only		Dry Dry Dry	Going ahead Stopped	Pick-up truck Municipal transit bus	Other motor vehicle Other motor vehicle	0
47	2013-12-12 Thu 13:10 Clear	Daylight Turning	P.D. only	V1 E V2 W	Dry Dry	Turning right Turning left	Automobile, station Automobile, station	Other motor vehicle Other motor vehicle	0
48	2013-12-16 Mo 15:00 Clear	Daylight Sideswipe	P.D. only	V1 N V2 N	Loose snow Loose snow	Turning left Stopped	Unknown Automobile, station	Other motor vehicle Other motor vehicle	0
49	2013-12-19 Thu 13:30 Clear	Daylight Turning	P.D. only		Slush Slush	Making U-Turn Going ahead	Automobile, station Automobile, station Automobile, station	Other motor vehicle Other motor vehicle	0
50	2013-12-24 Tue 14:30 Clear	Daylight Turning	P.D. only	V1 E V2 W	Slush Slush	Turning left Going ahead	Automobile, station Automobile, station	Other motor vehicle Other motor vehicle	0

OnTRAC Reporting System CARLING AVE & WESTGATE SC - E

FROM:	2013-01-01	TO: 2014-01-01

For	rmer Municipality: Ottawa	Traffic Control: Traffic sign	nal	Number of Coll	isions: 5		
	DATE DAY TIME ENV	IMPACT LIGHT TYPE CI	LASS DIR		HCLE DEUVRE VEHICLE TYPE	FIRST EVENT	No. PED
51	2013-01-11 Fri 12:12 Rain		D. only V1 E V2 W V3 S	Wet Turning Wet Going Wet Going	ahead Automobile, station	Other motor vehicle Other motor vehicle Other motor vehicle	0
	COMMENTS: EXACT LOCATION UNKNO						
52	2013-05-22 We 21:37 Clear	Dark Turning No		Dry Turning Dry Slowin	5	Cyclist Other motor vehicle	0
53	2013-06-25 Tue 16:30 Clear		D. only V1 E V2 E	Wet Slowin Wet Stoppe	o ,	Other motor vehicle Other motor vehicle	0
	COMMENTS: EXACT LOCATION UNKNO						
54	2013-08-04 Sun 18:37 Clear	Daylight Single vehicle P.I	D. only V1 W	Wet Turning	g right Truck and trailer	Pole (utility, tower)	0
55	2013-08-20 Tue 18:02 Clear	Daylight Turning P.I	,	Dry Turning Dry Going		Other motor vehicle Other motor vehicle	0
ME	ERIVALE RD & THAMES ST						
Foi	rmer Municipality: Ottawa	Traffic Control: Stop sign		Number of Coll	sions: 1		
		IMPACT			HICLE		No.
	DATE DAY TIME ENV	LIGHT TYPE CL	LASS DIR	COND'N MANO	DEUVRE VEHICLE TYPE	FIRST EVENT	PED

2013-01-06 Sun 03:21 Snow Dark Single vehicle P.D. only V1 N Packed snow Automobile, station Skidding/Sliding 56 Going ahead 0





Public Works - Traffic Services

Classification and Occupancy - All Vehicles Report All Modes (15 Minute Increments)

HIGHWAY 417 btwn HWY417 IC122 RAMP15 & HWY417 IC121B RAMP51

	nt Statio enline :	28	004		Sı	urvey Dat	е:	Wednesda 2011	y, Noverr	ber 09
	Full Stu	dy				Inbo	ound			
		Pass.	Vehicles	Tru	icks	All E	Buses	Bil	(es	Peds
Time	Period	No.	Occ.	No.	Occ.	No.	Occ.	No.	Occ.	
06:00	06:15	481	485	49	53	0	0	0	0	0
06:15	06:30	822	822	46	46	0	0	0	0	0
06:30	06:45	1097	1097	63	64	1	1	0	0	0
06:45	07:00	1139	1139	82	82	1	1	0	0	0
6:00	7:00	3539	3543	240	245	2	2	0	0	0
07:00	07:15	1179	1179	69	69	2	2	0	0	0
07:15	07:30	1246	1246	68	68	7	7	0	0	0
07:30	07:45	1151	1152	53	53	2	2	0	0	0
07:45	08:00	1377	1377	91	91	1	1	0	0	0
7:00	8:00	4953	4954	281	281	12	12	0	0	0
08:00	08:15	1218	1218	75	75	1	1	0	0	0
08:15	08:30	1292	1292	58	58	1	1	0	0	0
08:30	08:45	1277	1277	64	64	0	0	0	0	0
08:45	09:00	1298	1298	87	94	0	0	0	0	0
8:00	9:00	5085	5085	284	291	2	2	0	0	0
09:00	09:15	1311	1311	75	75	3	3	0	0	0
09:15	09:30	1185	1185	107	107	0	0	0	0	0
09:30	09:45	1151	1151	96	96	2	2	0	0	0
09:45	10:00	1208	1216	93	93	1	1	0	0	0
9:00	10:00	4855	4863	371	371	6	6	0	0	0
15:00	15:15	1605	1605	66	66	2	2	0	0	0
15:15	15:30	1568	1596	93	93	1	2	0	0	0
15:30	15:30	1308	1410	93 51	93 51	0	0	0	0	
				51 52	52			0	0	0
15:45 15:00	16:00	1282	1351 5962	262	262	1 4	1 4	0	0	0
	16:00	5865				4 1	4		0	
16:00 16:15	16:15 16:30	1058 1270	1058 1270	43 39	43 39	0	0	0 0	0	0 0
16:30	16:30 16:45	1270	1270		39 44	2	2	0	0	0
16:30 16:45	10.45 17:00	1334	1334	44 39	44 39	2 1	2 1	0	0	0
16.45 16:00	17:00	4829	4844	165	165			0	0	
17:00	17:00	1308	1308	25	25	4	4	0	0	0
17:15 17:30	17:30 17:45	1249	1249	57 22	57	1	1	0	0	0
		1360	1360	33	33	2	2	0	0	0
17:45	18:00	1206	1206	31	31	8	8	0	0	0
17:00	18:00	5123	5123	146	146	13	13	0	0	0
18:00	18:15	1291	1291	33	33	3	3	0	0	0
18:15	18:30	1236	1236	37	37	0	0	0	0	0
18:30	18:45	1358	1358	32	32	2	2	0	0	0
18:45	19:00	1316	1316	13	13	1	1	0	0	0
18:00	19:00	5201	5201	115	115	6	6	0	0	0

Note: Any Inter-City Buses included have an assumed Outbound occupancy of 30. *For School & Other Buses drivers are not considered occupants. *Passenger Vehicles include Autos, Taxis and Other Vehicles.



Public Works - Traffic Services

Classification and Occupancy - All Vehicles Report All Modes (15 Minute Increments)

Cour	nt Statio			417 btwi	1 HWY417	IC122 R	AMP15	& HWY417 I	C121B R	AMP51
	enline :	n: 500 28	104		ຣເ	irvey Dat	te :	Wednesda 2011	y, Noven	nber 09,
	Full Stu	dy				Inbo	ound			
		Pass.	Vehicles	Tru	cks	All	Buses	Bil	kes	Peds
Time	Period	No.	Occ.	No.	Occ.	No.	Occ.	No.	Occ.	
Directio	nTotal :	39450	39575	1864	1876	49	49	0	0	0
	Full Stu	dy				Outb	ound			
		Pass.	Vehicles	Tru	cks	All	Buses	Bil	es	Peds
Time	Period	No.	Occ.	No.	Occ.	No.	Occ.	No.	Occ.	
06:00	06:15	854	854	57	57	0	0	0	0	0
06:15	06:30	1237	1237	87	87	0	0	0	0	0
06:30	06:45	1477	1477	76	76	1	1	0	0	0
06:45	07:00	1465	1465	65	66	1	1	0	0	0
6:00	7:00	5033	5033	285	286	2	2	0	0	0
07:00	07:15	1429	1429	85	85	1	1	0	0	0
07:15	07:30	1225	1225	82	82	0	0	0	0	0
07:30	07:45	1566	1566	81	82	1	1	0	0	0
07:45	08:00	1519	1519	68	68	3	3	0	0	0
7:00	8:00	5739	5739	316	317	5	5	0	0	0
08:00	08:15	1373	1373	53	53	3	3	0	0	0
08:15	08:30	1519	1519	96	96	1	1	0	0	0
08:30	08:45	1630	1630	60	61	5	6	0	0	0
08:45	09:00	1567	1567	76	77	3	3	0	0	1
8:00	9:00	6089	6089	285	287	12	13	0	0	1
09:00	09:15	1478	1478	84	84	8	8	0	0	0
09:15	09:30	1377	1377	102	102	11	11	0	0	0
09:30	09:45	1284	1284	103	108	8	8	0	0	0
09:45	10:00	1259	1259	127	127	6	6	0	0	0
9:00	10:00	5398	5398	416	421	33	33	0	0	0
15:00	15:15	1482	1482	146	149	8	8	0	0	0
15:15	15:30	1490	1490	84	87	7	7	0	0	0
15:30	15:45	1202	1202	77	77	5	5	0	0	0
15:45	16:00	1254	1254	110	110	3	3	0	0	0
15:00	16:00	5428	5428	417	423	23	23	0	0	0
16:00	16:15	977	977	92	92	5	5	0	0	0
16:15	16:30	584	584	54	54	2	2	0	0	0
16:30	16:45	809	809	82	82	9	9	0	0	0
16:45	17:00	939	939	62	62	5	5	0	0	0
16:00	17:00	3309	3309	290	290	21	21	0	0	0
17:00	17:15	957	957	63	63	3	3	0	0	0
17:15	17:30	832	832	67	67	3	3	0	0	0
17:30	17:45	998	998	75	75	1	1	0	0	0
17:45	18:00	1311	1311	80	82	2	2	0	0	0

Note: Any Inter-City Buses included have an assumed Outbound occupancy of 30. *For School & Other Buses drivers are not considered occupants. *Passenger Vehicles include Autos, Taxis and Other Vehicles.



Public Works - Traffic Services

Classification and Occupancy - All Vehicles Report All Modes (15 Minute Increments)

HIGHWAY 417 btwn HWY417 IC122 RAMP15 & HWY417 IC121B RAMP51

Cour	nt Statio	n : 500)04									
Scre	enline :	28			Sı	irvey Dat	Wednesda 2011	y, Noven	ber 09			
	Full Stu	dy		Outbound								
		Pass.	Vehicles	Tru	cks		Buses	Bi	kes	Peds		
Time	Period	No.	Occ.	No.	Occ.	No.	Occ.	No.	Occ.			
17:00	18:00	4098	4098	285	287	9	9	0	0	0		
18:00	18:15	1015	1015	57	61	0	0	0	0	0		
18:15	18:30	1257	1257	70	70	1	1	1	1	0		
18:30	18:45	1226	1226	36	36	3	3	0	0	0		
18:45	19:00	1218	1218	49	49	0	0	0	0	0		
18:00	19:00	4716	4716	212	216	4	4	1	1	0		
Directio	nTotal :	39810	39810	2506	2527	109	110	1	1	1		
Period 1	fotal :	79260	79385	4370	4403	158	159	1	1	1		
Report 1	Fotal :	79260	79385	4370	4403	158	159	1	1	1		

Note: Any Inter-City Buses included have an assumed Outbound occupancy of 30. *For School & Other Buses drivers are not considered occupants. *Passenger Vehicles include Autos, Taxis and Other Vehicles.

Study Name 27 - 003813 - Carling at CPR Underpass - May - 25th Start Date 05/25/2016 Start Time 7:00 AM Site Code Motorcycles

Channel	Lane 1	Lane 2	Lane 3	Lane 1	Lane 2	Lane 3
Direction	Westbound	Westbound	Westbound	Eastbound	Eastbound	Eastbound
7:00 AM	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0
7:30 AM	0	1	0	0	0	2
7:45 AM	0	0	0	0	1	1
8:00 AM	0	0	0	0	0	0
8:15 AM	1	0	0	0	0	0
8:30 AM	0	0	0	0	0	0
8:45 AM	1	0	1	2	0	0
9:00 AM	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0
9:30 AM	1	0	1	1	0	0
9:45 AM	1	0	0	0	0	1
10:00 AM	0	0	0	0		0
10:15 AM	0	0	0	0	1	0
10:30 AM	0	0	0	0		0
10:45 AM	0	0	0	1	0	0
11:00 AM	0	0	0	1	0	0
11:15 AM	0	0	1	0		0
11:30 AM	0	0	0	0		1
11:45 AM	1	0	0	2		0
12:00 PM	0	0	1	0		0
12:15 PM	0	0	0	0		0
12:30 PM	0	0	0	0		0
12:45 PM	0	0	1	0	0	0
1:00 PM	1	1	0	0		2
1:15 PM	0	0	2	0		0
1:30 PM	0	0	0	1	0	1
1:45 PM	0	1	0	0	0	1
2:00 PM	0	1	0	1		1
2:15 PM	0	0	0	0		
2:30 PM 2:45 PM	0	0	1	0	0 0	0
2.45 PM 3:00 PM	1	0	2	1	0	0
3:00 PM 3:15 PM	0	0	2	0		0
3:30 PM	0	2	1	1	0	0
3:45 PM	1	2	0	0		0
4:00 PM	1	1	1	0	0	0
4:00 PM 4:15 PM	1	1	3	0		2
4:13 PM 4:30 PM	0	0	0	1		2
4:45 PM	2	1	2	2		1
5:00 PM	2	1	1	0		0
5:15 PM	1	0	0	0		0
5:30 PM	0	1	1	1	0	0
5:45 PM	1	0	0	0	0	0
6:00 PM	0	0	2	0		0
6:15 PM	0	0	1	1	1	0
6:30 PM	0	0	0	0		1
6:45 PM	0	1	1	0		0
	0	I	1	0	0	Ű

Study Name 27 - 003813 - Carling at CPR Underpass - May - 25th Start Date 05/25/2016 Start Time 7:00 AM Site Code CARS

Channel	Lane 1 Lane 2		Lane 3	Lane 1	Lane 2	Lane 3
Direction	Westbound	Westbound	Westbound	Eastbound	Eastbound	Eastbound
-						
7:00 AM	33	46	19	57	71	77
7:15 AM	49	65	26	66	83	72
7:30 AM	59	60	37	69	75	105
7:45 AM	46	79	50	62	70	71
8:00 AM	53	78	38	51	67	63
8:15 AM	43	78	43	36	50	53
8:30 AM	42	82	55	44	62	52
8:45 AM	49	87	53	38	46	42
9:00 AM	54	81	50	24	39	39
9:15 AM	34	66	38	24	50	29
9:30 AM	19	73	36	39	60	41
9:45 AM	18	71	26	34	41	38
10:00 AM	4	66	26	37	50	32
10:15 AM	25	67	36	38	44	46
10:30 AM	22	51	28	40	62	38
10:45 AM	16	55	25	45	62	50
11:00 AM	23	66	27	38	53	55
11:15 AM	18	77	25	45	60	40
11:30 AM	27	82	40	39	62	50
11:45 AM	31	76	47	31	54	50
12:00 PM	28	85	38	36	52	35
12:15 PM	29	77	38	38	57	40
12:30 PM	21	93	57	39	53	47
12:45 PM	29	90	46	38	64	53
1:00 PM	31	73	52	42	59	42
1:15 PM	30	82	36	31	69	50
1:30 PM	21	63	42	40	55	42
1:45 PM	21	93	34	36	61	52
2:00 PM	34	65	35	66	71	58
2:15 PM	30	85	40	60	90	59
2:30 PM	25	82	47	67	85	80
2:45 PM	33	94	44	61	82	71
3:00 PM	20	104	59	77	76	75
3:15 PM	38	94	70	71	90	52
3:30 PM	46	113	106	92	71	72
3:45 PM	54	135	104	70	70	61
4:00 PM	65	131	118	69	60	57
4:15 PM	57	148	106	80	84	60
4:30 PM	79	153	146	69	69	52
4:45 PM	70	164	128	55	57	66
5:00 PM	90	163	161	47	52	34
5:15 PM	70	160	146	35	55	43
5:30 PM	93	145	148	38	51	34
5:45 PM	54	125	101	28	59	56
6:00 PM	46	138	107	40	51	38
6:15 PM	48	107	91	32	58	31
6:30 PM	38	91	58	25	47	32
6:45 PM	32	71	39	23	33	36

Study Name 27 - 003813 - Carling at CPR Underpass - May - 25th Start Date 05/25/2016 Start Time 7:00 AM Site Code Light Trucks

Channel	Lane 1	Lane 2	Lane 3	Lane 1	Lane 2	Lane 3
Direction	Westbound	Westbound	Westbound	Eastbound	Eastbound	Eastbound
7:00 AM	2	3	3	3	9	3
7:15 AM	1	7	3	3	5	3
7:30 AM	6	6	5	12	5	8
7:45 AM	1	5	4	3	2	5
8:00 AM	4	7	4	3	5	4
8:15 AM	4	3	2	2	8	7
8:30 AM	7	10	2	2	7	4
8:45 AM	6	5	1	3	7	10
9:00 AM	3	5	8	2	3	8
9:15 AM	2	4	0	1	8	7
9:30 AM	3	7	2	1	2	3
9:45 AM	3	3	2	5	7	3
10:00 AM	1	5	1	2	5	5
10:15 AM	0	6	5	5	13	7
10:30 AM	7	8	2	5	5	4
10:45 AM	3	11	5	2	5	3
11:00 AM	3	13	2	4	4	4
11:15 AM	0	4	4	1	6	2
11:30 AM	1	4	3	2	8	7
11:45 AM	2	6	1	1	4	5
12:00 PM	3	11	1	7	7	8
12:15 PM	3	9	2	3	6	4
12:30 PM	2	7	2	4	5	5
12:45 PM	7	5	4	5	9	2
1:00 PM	2	12	5	3	4	4
1:15 PM	3	4	4	4	4	5
1:30 PM	5	4	4	2	3	7
1:45 PM	6	8	6	4	2	4
2:00 PM	4	10	3	2	7	7
2:15 PM	2	9	3	7	5	6
2:30 PM	1	6	4	3	8	6
2:45 PM	6	8	4	1	2	9
3:00 PM	4	8	6	2	7	3
3:15 PM	4	7	3	3	7	10
3:30 PM	3	7	11	5	4	3
3:45 PM	3	6	4	3	3	4
4:00 PM	9	12	7	4	3	2
4:15 PM	4	7	15	5	5	3
4:30 PM	7	10	10	4	1	3
4:45 PM	2	10	7	1	4	2
5:00 PM	8	12	8	0	5	1
5:15 PM	6	8	5	5	1	1
5:30 PM	4	9	4	3	3	2
5:45 PM	3	6	8	0	3	2
6:00 PM	2	7	4	2	0	1
6:15 PM	2	8	2	0	1	1
6:30 PM	3	4	6	1	1	1
6:45 PM	0	6	4	0	5	0

Study Name 27 - 003813 - Carling at CPR Underpass - May - 25th Start Date 05/25/2016 Start Time 7:00 AM Site Code Busses

Channel	Lane 1	Lane 2	Lane 3	Lane 1	Lane 2	Lane 3
Direction	Westbound	Westbound	Westbound	Eastbound	Eastbound	Eastbound
7:00 AM	5	0	0	1	3	1
7:15 AM	5	2	0	3	0	1
7:30 AM	5	0	0	2	1	1
7:45 AM	6	0	0	2	2	0
8:00 AM	7	1	0	1	2	2
8:15 AM	6	0	0	1	3	1
8:30 AM	5	1	0	2	3	2
8:45 AM	6	0	0	2	1	2
9:00 AM	7	0	0	2	3	0
9:15 AM	4	3	1	2	0	1
9:30 AM	6	0	0	1	1	1
9:45 AM	4	1	0	3	1	0
10:00 AM	0	2	0	2	1	0
10:15 AM	3	1	0	0	1	0
10:30 AM	3	0	0	1	1	1
10:45 AM	2	0	0	2	0	1
11:00 AM	2	0	0	2	0	0
11:15 AM	2	1	0	0	1	1
11:30 AM	2	1	0	2	4	0
11:45 AM	2	1	0	1	0	0
12:00 PM	2	0	0	1	4	0
12:15 PM	3	1	0	1	0	0
12:30 PM	2	0	0	1	1	0
12:45 PM	2	1	0	3	0	3
1:00 PM	2	0	0	1	1	1
1:15 PM	1	2	0	1	0	1
1:30 PM	4	0	0	1	1	1
1:45 PM	2	2	0	1	1	0
2:00 PM 2:15 PM	1	0	0	3	2	0
2:30 PM	4	1	0	2	2	1
2:45 PM	3 1	2	0	3	1	2
3:00 PM	6	0	0	2	2	0
3:15 PM	1	2	0	2	2	2
3:30 PM	3	3	0	4	1	0
3:45 PM	1	0	0	1	1	0
4:00 PM	3	1	0	3	1	1
4:15 PM	5	1	0	1	0	1
4:30 PM	2	0	0	3	1	1
4:45 PM	2	0	0	2	0	1
5:00 PM	3	0	0	- 1	1	0
5:15 PM	4	0	0	0	0	1
5:30 PM	1	1	0	1	0	0
5:45 PM	2	0	0	2	1	0
6:00 PM	- 7	1	0	- 1	1	1
6:15 PM	3	1	0	1	0	1
6:30 PM	4	2	0	1	0	1
6:45 PM	2	0	0	0	0	0

Study Name 27 - 003813 - Carling at CPR Underpass - May - 25th Start Date 05/25/2016 Start Time 7:00 AM Site Code Single Unit Trucks

Channel	Lane 1	Lane 2	Lane 3	Lane 1	Lane 2	Lane 3
Direction	Westbound	Westbound	Westbound	Eastbound	Eastbound	Eastbound
	riotizouna	Hootoodina	1100tb0dilld	Laoto dalla	Edobodina	Eddibodilid
7:00 AM	1	3	1	0	2	2
7:15 AM	0	4	0	1	2	4
7:30 AM	0	2	1	1	6	0
7:45 AM	0	2	1	0	1	1
8:00 AM	0	1	0	0	2	0
8:15 AM	0	4	0	3	2	1
8:30 AM	1	4	1	0	1	2
8:45 AM	3	1	0	1	3	3
9:00 AM	1	3	0	0	1	1
9:15 AM	0	2	0	0	1	1
9:30 AM	0	2	0	2	2	1
9:45 AM	1	2	0	4	1	2
10:00 AM	1	1	0	0	1	1
10:15 AM	1	1	0	0	2	1
10:30 AM	1	2	1	0	0	1
10:45 AM	4	2	1	0	0	1
11:00 AM	5	0	0	0	1	2
11:15 AM	1	3	3	0	0	0
11:30 AM	2	3	0	0	1	0
11:45 AM	2	2	1	0	1	3
12:00 PM	1	0	1	0	1	3
12:15 PM	1	0	2	3	2	2
12:30 PM	1	2	0	0	1	0
12:45 PM	2	2	0	0	2	0
1:00 PM	0	3	1	0	4	0
1:15 PM	0	3	0	1	2	2
1:30 PM	2	3	0	0	1	0
1:45 PM	0	0	0	1	1	0
2:00 PM	2	3	0	1	2	0
2:15 PM	2	0	0	0	3	2
2:30 PM	1	1	2	1	3	1
2:45 PM	1	1	1	0	2	1
3:00 PM	2	1	0	0	2	1
3:15 PM	1	1	2	0	2	1
3:30 PM	0	2	0	0	2	1
3:45 PM	1	1	0	0	2	0
4:00 PM	1	0	0	1	0	0
4:15 PM	0	3	2	0	1	0
4:30 PM	0	4	0	1	1	1
4:45 PM	1	3	0	0	0	0
5:00 PM	1	2	0	0	0	0
5:15 PM	2	0	1	0	1	0
5:30 PM	0	0	1	0	0	0
5:45 PM	0	1	0	0	0	0
6:00 PM	0	0	0	0	2	0
6:15 PM	1	0	0	0	0	0
6:30 PM	1	0	0	0	0	0
6:45 PM	0	1	0	0	1	0

Study Name 27 - 003813 - Carling at CPR Underpass - May - 25th Start Date 05/25/2016 Start Time 7:00 AM Site Code Heavy Trucks

Channel	Lane 1	Lane 2	Lane 3	Lane 1	Lane 2	Lane 3
Direction	Westbound	Westbound	Westbound	Eastbound	Eastbound	Eastbound
2	11001000110	The second		Laotoodina	Edologana	Laotobaria
7:00 AM	0	0	0	0	1	0
7:15 AM	0	0	0	0		0
7:30 AM	0	1	0	0	0	0
7:45 AM	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0
8:15 AM	0	0	0	0	1	0
8:30 AM	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0
9:00 AM	0	1	0	0	0	0
9:15 AM	0	0	0	0	0	0
9:30 AM	0	1	0	0	0	0
9:45 AM	0	0	0	0	0	1
10:00 AM	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0
10:30 AM	0	0	0	0		0
10:45 AM	0	1	0	0	0	0
11:00 AM	0	0	0	0		0
11:15 AM	0	2	0	0		0
11:30 AM	0	0	0	0		0
11:45 AM	0	1	0	0		0
12:00 PM	0	1	0	0		0
12:15 PM	0	1	0	0		0
12:30 PM	0	0	0	0		0
12:45 PM	0	0	0	0	0	0
1:00 PM	0	0	0	0		0
1:15 PM	0	0	0	0		0
1:30 PM	0	0	0	0		0
1:45 PM	0	0	0	0		0
2:00 PM	0	1	0	0		0
2:15 PM	0	0	0	0		0
2:30 PM	0	1	0	0		1
2:45 PM	0	0	0	0		0
3:00 PM 3:15 PM	0	0	0	0		0
3:15 PM 3:30 PM	0	1	0	0		0
3:30 PM 3:45 PM	0	0	0	0		0
4:00 PM	0	0	0	0	0	0
4:00 PM 4:15 PM	0	0	0	0		0
4:15 PM 4:30 PM	0	0	0	0		0
4:30 PM 4:45 PM	0	0	0	0	0	0
5:00 PM	0	0	0	0		0
5:15 PM	0	0	0	0		0
5:30 PM	0	0	0	0		1
5:45 PM	0	1	0	0	0	0
6:00 PM	0	0	0	0		0
6:15 PM	0	0	0	0		0
6:30 PM	0	0	0	0		0
6:45 PM	0	0	0	0		0
0.401 10	0	0	0	0	0	0



Carling/Merivale <u>8 hrs</u>

2010 16-Jul 3453 2070 3984 3363 6524 4943 4103 7688 36128 2014 18-Aug 3248 1860 3304 4001 7269 5109 4807 7658 37256 2015 15-Oct 3818 2001 4620 4741 9319 7641 6234 9608 47982 2016 4-Aug 3857 1709 3857 3959 7615 7663 5304 8466 42430 Vear Counts * <t< th=""><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th></t<>											
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Vear Courts 7668 77658 <th7< td=""><td>2003</td><td>18-Jun</td><td>3815</td><td>2261</td><td>4383</td><td>4435</td><td>8072</td><td>6884</td><td>6264</td><td>8954</td><td>45068</td></th7<>	2003	18-Jun	3815	2261	4383	4435	8072	6884	6264	8954	45068
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	2010	16-Jul	3453	2070	3984	3363	6524	4943	4103	7688	36128
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Vear Counts % Change 2016 4-Aug 3857 1709 3857 3959 7615 7663 5304 8466 42430 North Leg Vear NB 58 NB+5B INT NB SB SB </td <td>2015</td> <td>15-Oct</td> <td>3818</td> <td>2001</td> <td>4620</td> <td>4741</td> <td>9319</td> <td>7641</td> <td>6234</td> <td>9608</td> <td>47982</td>	2015	15-Oct	3818	2001	4620	4741	9319	7641	6234	9608	47982
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		North Leg	Year	NB	SB	NB+SB	INT	NB	SB	NB+SB	INT
$E_{ast Leg} = \frac{2014}{2015} = \frac{1860}{2010} = \frac{3248}{3857} = \frac{5108}{5566} = \frac{37256}{47982} = \frac{-10.1\%}{-14.6\%} = \frac{5.9\%}{1.0\%} = \frac{-7.5\%}{1.3\%} = \frac{3.1\%}{2.8\%} = \frac{21.8\%}{-11.6\%} = \frac{2003}{3857} = \frac{2282}{3615} = \frac{3683}{5566} = \frac{5965}{42430} = \frac{-14.6\%}{1.4.6\%} = \frac{1.0\%}{1.0\%} = \frac{-1.3\%}{-1.3\%} = \frac{-1.1\%}{-1.1\%} = \frac{-1.1\%}{-1.0\%} = \frac{-1.1\%}{-1.1\%} = \frac{-1.1\%}{-1.1$		Γ	2003	2261	3815	6076	45068				
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$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$			2010	4103	7688	11791	36128	-34.5%	-14.1%	-22.5%	-19.8%
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Regression Estimate Regression Estimate Average Annual Change 2003 5173 5173 8436 6071% 8436 8436 90.10% 90.10% 90.34% 14225 13608 90.34%East LegYearCounts% Change 884 100% 2010 2010 4943 2010 4943 2014 2010 4943 2014 2016% Change 884 114956 45068 114956 45068 2010 45068 2010 4509 2014 2014 2016% Change 7269 12378 12378 37256 37256 3.4% 11.4% 7.9% 3.1% 2016 7663 7615% Change 7269 12378 37256 3.4% 11.4% 7.9% 20.3% 11.4% 7.9% 2016 2016 7663 2016 7663 761515278 15278 42430 0.3% 0.3% 0.3% 0.3% -9.9% -11.6%Vear Counts Counts 0.68% 0.32% 0.32% 0.48%South LegYear Year Counts Counts Counts 0.32% 0.48%Vear Counts Counts 0.32% 0.48%South LegYear Year Counts Counts Counts Counts 0.32% 0.48%Vear Year Counts Counts 0.32% 0.48%NB SB NB+SB INT NB 1000 10000 10000% Change % Change 2016 0.383 14504 0.68% 0.32% 0.32%Vear Year 2003 2010 20			2015	6234	9608	15842	47982	29.7%	25.5%	27.1%	28.8%
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201039843363734736128-9.1%-24.2%-16.7%-19.8%201433044001730537256-17.1%19.0%-0.6%3.1%20154620474193614798239.8%18.5%28.1%28.8%201638573959781642430-16.5%-16.5%-16.5%-11.6%			2003						55	10730	, , , , ,
201433044001730537256-17.1%19.0%-0.6%3.1%20154620474193614798239.8%18.5%28.1%28.8%201638573959781642430-16.5%-16.5%-16.5%-11.6%								_0 1%	-21 204	-16 7%	-10 20/
20154620474193614798239.8%18.5%28.1%28.8%201638573959781642430-16.5%-16.5%-16.5%-16.5%-11.6%											
2016 3857 3959 7816 42430 -16.5% -16.5% -16.5% -11.6%											
Regression Estimate 2003 4292 4129 8421		L	2010	3037	3707	/010	42430	-10.576	-10.576	-10.576	-11.076
		Regression Estimate	2003	4292	4129	8421					

Regression Estimate	2003	4292	4129	8421
Regression Estimate	2016	3895	4085	7980
Average Annual Change		-0.74%	-0.08%	-0.41%

Carling/Merivale AM Peak

Year	Date	Nort	h Leg	South	n Leg	Eas	East Leg West Leg		Total	
rear	Date	SB	NB	NB	SB	WB	EB	EB	WB	Total
2003	18-Jun	535	341	736	453	773	1181	937	1006	5962
2010	16-Jul	478	254	608	437	644	867	661	833	4782
2014	18-Aug	431	258	437	437	712	698	642	829	4444
2015	15-Oct	530	267	741	532	775	1289	993	951	6078
2016	4-Aug	448	221	569	400	659	949	739	845	4830
2010	1 7 10g	110		007	100	007	, , , ,	, ,	0.0	1000
	Г		1	Cou	nts			% CI	nange	
	North Leg	Year	NB	SB	NB+SB	INT	NB	SB	NB+SB	INT
		2003	341	535	876	5962	112	00	ILD / OD	
		2003	254	478	732	4782	-25.5%	-10.7%	-16.4%	-19.8%
		2010	258	431	689	4444	1.6%	-9.8%	-5.9%	-7.1%
		2014	258	530	797	6078	3.5%	23.0%	15.7%	36.8%
		2015	207	448	669	4830	-17.2%	-15.5%	-16.1%	-20.5%
	L	2010	221	440	009	4630	-17.270	-15.5%	-10.170	-20.5%
	Regression Estimate	2003	332	527	859					
		2003	236	463	698					
	Regression Estimate	2010								
	Average Annual Change		-2.60%	-0.99%	-1.58%					
	F		1	0			1	04.0		
		Year	50	Cou		(N/T	50		nange	(A/T
	West Leg		EB	WB	EB+WB	INT	EB	WB	EB+WB	INT
		2003	937	1006	1943	5962				
		2010	661	833	1494	4782	-29.5%	-17.2%	-23.1%	-19.8%
		2014	642	829	1471	4444	-2.9%	-0.5%	-1.5%	-7.1%
		2015	993	951	1944	6078	54.7%	14.7%	32.2%	36.8%
	L	2016	739	845	1584	4830	-25.6%	-11.1%	-18.5%	-20.5%
	Regression Estimate	2003	866	972	1838					
	Regression Estimate	2016	758	852	1610					
	Average Annual Change		-1.03%	-1.01%	-1.02%					
	-		1				1			
	_	Year		Cou					nange	
	East Leg		EB	WB	EB+WB	INT	EB	WB	EB+WB	INT
		2003	1181	773	1954	5962				
		2010	867	644	1511	4782	-26.6%	-16.7%	-22.7%	-19.8%
		2014	698	712	1410	4444	-19.5%	10.6%	-6.7%	-7.1%
		2015	1289	775	2064	6078	84.7%	8.8%	46.4%	36.8%
	L	2016	949	659	1608	4830	-26.4%	-15.0%	-22.1%	-20.5%
	Regression Estimate	2003	1096	746	1842					
	Regression Estimate	2016	946	696	1642					
	Average Annual Change		-1.13%	-0.53%	-0.88%					
		Voar		Cou	nts			% CI	nange	
	South Leg	Year	NB	SB	NB+SB	INT	NB	SB	NB+SB	INT
	Ē	2003	736	453	1189	5962				
		2010	608	437	1045	4782	-17.4%	-3.5%	-12.1%	-19.8%
		2014	437	437	874	4444	-28.1%	0.0%	-16.4%	-7.1%
		2015	741	532	1273	6078	69.6%	21.7%	45.7%	36.8%
		2016	569	400	969	4830	-23.2%	-24.8%	-23.9%	-20.5%
	L	2010	,		, , ,		20.270	2.1.0.0	201770	
	Regression Estimate	2003	712	450	1162					
	Degression Estimate	2005	570	450	102					

 Regression Estimate
 2003
 712
 450
 1102

 Regression Estimate
 2016
 570
 453
 1023

 Average Annual Change
 -1.69%
 0.04%
 -0.97%

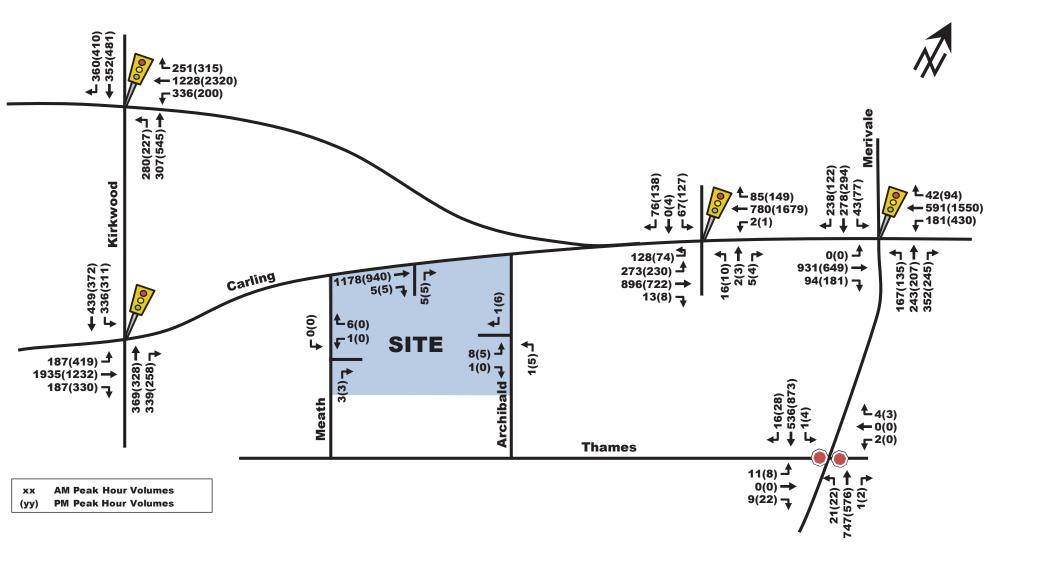
Carling/Merivale PM Peak

		Nort	h Leg	South	lea	Fast	t Leg	Wes	t Leg	[
ear	Date	SB	NB	NB	SB	WB	EB	EB	WB	Total
003	18-Jun	584	302	588	824	1605	962	938	1627	7430
010	16-Jul	437	311	576	540	1356	653	561	1426	5860
014	18-Aug	446	202	408	683	1492	719	649	1391	5990
015	15-Oct	466	276	571	881	2039	924	783	1778	7718
016	4-Aug	503	234	497	676	1646	1005	874	1605	7040
			•							
	ſ	Veen		Cou	nts			% CI	nange	
	North Leg	Year	NB	SB	NB+SB	INT	NB	SB	NB+SB	INT
	Ī	2003	302	584	886	7430				
		2010	311	437	748	5860	3.0%	-25.2%	-15.6%	-21.1%
		2014	202	446	648	5990	-35.0%	2.1%	-13.4%	2.2%
		2015	276	466	742	7718	36.6%	4.5%	14.5%	28.8%
		2016	234	503	737	7040	-15.2%	7.9%	-0.7%	-8.8%
	Regression Estimate	2003	314	552	866					
	Regression Estimate	2016	240	454	694					
	Average Annual Change		-2.04%	-1.49%	-1.69%					
	Г		1	0.000			1	04 01		
	Westlag	Year	EB	Cou WB	EB+WB	INT	EB	WB	nange EB+WB	INT
	West Leg	2003	938	1627	2565	7430	ED	VVD	ED+VVD	1/1/1
		2003	938 561	1426	2565 1987	7430 5860	-40.2%	-12.4%	-22.5%	-21.1%
		2010	649	1391	2040	5880 5990	15.7%	-12.4%	2.7%	2.2%
		2014	783	1778	2040 2561	7718	20.6%	27.8%	25.5%	28.8%
		2015	874	1605	2479	7040	11.6%	-9.7%	-3.2%	-8.8%
	F							ļ <u>, , , , , , , , , , , , , , , , , , , </u>		
	Regression Estimate	2003	829	1552	2382					
	Regression Estimate	2016	726	1572	2298					
	Average Annual Change		-1.02%	0.10%	-0.27%					
	г		r	0			1			
	F	Year		Cou		1.4/7	50		nange	(A/T
	East Leg	2003	EB 962	WB	EB+WB	7430	EB	WB	EB+WB	INT
				1605	2567		22.10/	15 50/	21 70/	01 10/
		2010	653 719	1356	2009 2211	5860 5990	-32.1% 10.1%	-15.5% 10.0%	-21.7%	-21.1%
		2014	924	1492 2039					10.1%	2.2%
		2015 2016	924 1005	2039 1646	2963 2651	7718 7040	28.5%	36.7% -19.3%	34.0% -10.5%	28.8% -8.8%
	L	2016	1005	1040	2001	7040	8.8%	-19.3%	-10.5%	-0.0%
	Regression Estimate	2003	855	1492	2347					
	Regression Estimate	2005	851	1697	2548					
	Average Annual Change	2010	-0.03%	0.99%	0.64%					
	interage initial change		0.0070	0.7770	0.0470					
	Г	Maran		Cou	nts			% CI	nange	
	South Leg	Year	NB	SB	NB+SB	INT	NB	SB	NB+SB	INT
	Ĩ	2003	588	824	1412	7430				
		2010	576	540	1116	5860	-2.0%	-34.5%	-21.0%	-21.1%
		2014	408	683	1091	5990	-29.2%	26.5%	-2.2%	2.2%
		2015	571	881	1452	7718	40.0%	29.0%	33.1%	28.8%
		2016	497	676	1173	7040	-13.0%	-23.3%	-19.2%	-8.8%
	Regression Estimate	2003	594	747	1341					
	Regression Estimate Regression Estimate	2003 2016	594 494	747 708	1341 1202					

Average Annual Change		-1.41%	-0.41%	-0.84%
Regression Estimate	2016	494	708	1202
Regression Estimate	2003	594	/4/	134



Appendix F Total Background 2024 Traffic Volumes and SYNCHRO Output



Background 2024 AM 1: Kirkwood & Carling EB

1: Kirkwood & Carling EE	3						
	٦	-	\mathbf{i}	†	1	- \	Ļ
	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Group Lane Configurations						SBL	
Traffic Volume (vph)	`` 187	€↑↑↑ 1935	۲ 187	TT 369	r 339	1 336	T 439
Future Volume (vph)	187	1935	187	369	339	336	439
Lane Group Flow (vph)	107	2057	107	388	357	354	439
	Perm	2057 NA	Perm	388 NA			462 NA
Turn Type Protected Phases	Perm	NA 2	Perm	NA 8	Perm	pm+pt 7	NA 4
Permitted Phases	2	Z	n	ð	0		4
	2	2	2	8	8 8	4	4
Detector Phase Switch Phase	Z	Z	2	ð	ð	1	4
	10.0	10.0	10.0	10.0	10.0	5.0	10.0
Minimum Initial (s)	29.2	10.0	10.0 29.2	10.0		5.0 10.1	
Minimum Split (s)		29.2		26.1	26.1		26.1
Total Split (s)	58.0	58.0	58.0	38.0	38.0	24.0	62.0
Total Split (%)	48.3%	48.3%	48.3%	31.7%	31.7%	20.0%	51.7%
Yellow Time (s)	3.7	3.7	3.7	3.3	3.3	3.3	3.3
All-Red Time (s)	2.5	2.5	2.5	2.8	2.8	1.8	2.8
Lost Time Adjust (s)	-2.2	-2.2	-2.2	-2.1	-2.1	-1.1	-2.1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag				Lag	Lag	Lead	
Lead-Lag Optimize?				Yes	Yes	Yes	
Recall Mode	C-Max	C-Max	C-Max	Min	Min	Min	Min
Act Effct Green (s)	55.7	55.7	55.7	32.3	32.3	56.3	56.3
Actuated g/C Ratio	0.46	0.46	0.46	0.27	0.27	0.47	0.47
v/c Ratio	0.26	0.96	0.26	0.43	0.88	0.75	0.55
Control Delay	21.5	44.2	6.8	37.5	64.6	31.5	25.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.5
Total Delay	21.5	44.2	6.8	37.5	64.6	31.5	25.6
LOS	С	D	А	D	E	С	С
Approach Delay		39.5		50.5			28.1
Approach LOS		D		D			С
Queue Length 50th (m)	29.6	182.7	6.4	38.9	78.9	71.7	96.7
Queue Length 95th (m)	48.2	#224.7	20.4	53.2	#127.0	100.4	129.6
Internal Link Dist (m)		161.6		158.6			152.2
Turn Bay Length (m)	40.0				90.0		
Base Capacity (vph)	676	2138	745	960	429	474	862
Starvation Cap Reductn	0	0	0	0	0	0	123
Spillback Cap Reductn	Ű	0	0 0	0	0	Ű	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.96	0.26	0.40	0.83	0.75	0.63
	0.20	5.70	0.20	0.10	0.00	0.70	0.00
Intersection Summary							
Cycle Length: 120							
Actuated Cycle Length: 120							
Offset: 15 (13%), Referenced to ph	hase 2:EBTL, S	Start of Gree	en				
Natural Cycle: 90							
Control Type: Actuated-Coordinate	ed						
Maximum v/c Ratio: 0.96							
Intersection Signal Delay: 39.2				In	tersection L	OS: D	
Intersection Capacity Utilization 84	1.4%				CU Level of S		
Analysis Period (min) 15							
# 95th percentile volume exceed	ls capacity, qu	eue may be	longer.				
Queue shown is maximum after		oue may se	longon				
Splits and Phases: 1: Kirkwood							
	& Carling EB				Ø4		
58 s					62 s		
503					1		
					Ø7		
					24 s		

Background 2024 AM 2: Merivale & Carling

	→	4	+	1	1	~	1	Ļ	~	
ane Group	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR	
ane Configurations	†† }	<u> </u>	† †î>	1	101	1	<u> </u>	<u> </u>	7	
Fraffic Volume (vph)	931	181	591	167	243	352	43	278	238	
Future Volume (vph)	931	181	591	167	243	352	43	278	238	
ane Group Flow (vph)	1079	191	666	176	256	371	45	293	251	
Furn Type	NA	pm+pt	NA	Prot	NA	Perm	Prot	NA	Perm	
Protected Phases	2	1	6	3	8	T CHI	7	4	T GIIII	
Permitted Phases	L	6	0	0	U	8	,		4	
Detector Phase	2	1	6	3	8	8	7	4	4	
Switch Phase	2		0	5	0	0	1	г	т	
Minimum Initial (s)	10.0	5.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	
Ainimum Split (s)	29.0	10.4	29.0	11.3	37.7	37.7	11.3	37.7	37.7	
Fotal Split (s)	49.0	12.0	61.0	21.0	38.0	38.0	21.0	38.0	38.0	
Total Split (%)	40.8%	10.0%	50.8%	17.5%	31.7%	31.7%	17.5%	31.7%	31.7%	
fellow Time (s)	40.878	3.7	3.7	3.3	31.778	31.778	3.3	31.778	31.778	
All-Red Time (s)	2.3	1.7	2.3	3.0	3.4	3.4	3.0	3.4	3.4	
ost Time Adjust (s)	-2.0	-1.4	-2.0	-2.3	-2.7	-2.7	-2.3	-2.7	-2.7	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
.ead/Lag	Lag	Lead		Lead	Lag	Lag	Lead	Lag	Lag	
ead-Lag Optimize?	Yes	Yes	0.11	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	C-Max	None	C-Max	None	None	None	None	None	None	
Act Effct Green (s)	48.3	64.0	64.0	16.4	35.5	35.5	10.9	27.6	27.6	
Actuated g/C Ratio	0.40	0.53	0.53	0.14	0.30	0.30	0.09	0.23	0.23	
/c Ratio	0.56	0.68	0.26	0.76	0.49	0.58	0.29	0.71	0.53	
Control Delay	27.9	31.9	16.0	71.1	38.5	11.9	55.0	52.1	15.7	
Queue Delay	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	28.3	31.9	16.0	71.1	38.5	11.9	55.0	52.1	15.7	
.OS	С	С	В	E	D	В	D	D	В	
Approach Delay	28.3		19.6		33.3			36.8		
Approach LOS	С		В		С			D		
Queue Length 50th (m)	75.4	23.4	30.0	40.2	50.2	13.5	10.1	63.4	13.5	
Queue Length 95th (m)	90.2	#58.2	42.1	#71.5	73.5	42.5	21.2	87.7	36.2	
nternal Link Dist (m)	89.4		139.3		159.9			100.7		
Furn Bay Length (m)		90.0		40.0			28.0		35.0	
Base Capacity (vph)	1931	281	2563	240	533	642	240	505	537	
Starvation Cap Reductn	370	0	0	0	0	0	0	0	0	
pillback 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	0.69	0.68	0.26	0.73	0.48	0.58	0.19	0.58	0.47	
ntersection Summary										
Cycle Length: 120										
Actuated Cycle Length: 120										
Offset: 54 (45%), Referenced to pl	nase 2:EBT an	a 6:WBTL,	Start of Gree	en						
latural Cycle: 90										
Control Type: Actuated-Coordinate	ed									
/laximum v/c Ratio: 0.76										
ntersection Signal Delay: 28.8					ersection L(
ntersection Capacity Utilization 77	7.0%			IC	U Level of S	Service D				
nalysis Period (min) 15										
95th percentile volume exceed		eue may be	longer.							
Queue shown is maximum afte	r two cycles.									
Splits and Phases: 2: Merivale &	& Carling									
					1	*2		1		
					1 1 0	0.5		🗎 🕈 Ø4		
✔ø1 🚽 →ø2 (R)										
∳Ø1 → Ø2 (R) 12 s 49 s					21 s			38 s		

Background 2024 AM 3: Carling & Westgate SC

	1	۶	-	∢	+	•	Ť	1	Ļ	~	
Lane Group	EBU	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR	
Lane Configurations		Ä	ተተኈ	۲	ተተኈ		\$		÷f	1	
Traffic Volume (vph)	75	273	896	2	780	16	2	67	0	76	
Future Volume (vph)	75	273	896	2	780	16	2	67	0	76	
Lane Group Flow (vph)	0	366	957	2	910	0	24	0	71	80	
Turn Type	Perm	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	
Protected Phases			2		6		8		4		
Permitted Phases	2	2		6		8		4		4	
Detector Phase	2	2	2	6	6	8	8	4	4	4	
Switch Phase											
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	23.6	23.6	23.6	23.6	23.6	37.0	37.0	37.0	37.0	37.0	
Total Split (s)	83.0	83.0	83.0	83.0	83.0	37.0	37.0	37.0	37.0	37.0	
Total Split (%)	69.2%	69.2%	69.2% 3.7	69.2%	69.2%	30.8%	30.8%	30.8% 3.0	30.8%	30.8%	
Yellow Time (s)	3.7 1.9	3.7 1.9	3.7 1.9	3.7	3.7 1.9	3.0 4.0	3.0 4.0	3.0 4.0	3.0 4.0	3.0 4.0	
All-Red Time (s) Lost Time Adjust (s)	1.9	-1.6	-1.6	1.9 -1.6	-1.6	4.0	4.0 -3.0	4.0	4.0 -3.0	4.0 -3.0	
Total Lost Time (s)		4.0	-1.0	-1.0	4.0		-3.0 4.0		-3.0	-3.0	
Lead/Lag		4.0	4.0	4.0	4.0		4.0		4.0	4.0	
Lead-Lag Optimize?											
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None	None	
Act Effct Green (s)		93.8	93.8	93.8	93.8	NULLE	18.2	NONE	18.2	18.2	
Actuated g/C Ratio		0.78	0.78	0.78	0.78		0.15		0.15	0.15	
v/c Ratio		0.90	0.25	0.01	0.24		0.13		0.36	0.13	
Control Delay		40.8	4.4	5.0	4.2		34.6		48.6	10.4	
Queue Delay		0.0	0.0	0.0	0.1		0.0		0.0	0.0	
Total Delay		40.8	4.4	5.0	4.3		34.6		48.6	10.4	
LOS		D	A	A	A		С		D	В	
Approach Delay			14.5		4.3		34.6		28.4		
Approach LOS			В		А		С		С		
Queue Length 50th (m)		44.3	15.5	0.1	17.2		4.0		15.7	0.0	
Queue Length 95th (m)		#153.5	38.8	m0.4	31.4		10.0		25.1	11.6	
Internal Link Dist (m)			168.6		89.4		10.8		75.6		
Turn Bay Length (m)		70.0		36.0							
Base Capacity (vph)		405	3799	388	3728		382		357	464	
Starvation Cap Reductn		0	0	0	1470		0		0	0	
Spillback Cap Reductn		0	140	0	0		0		0	0	
Storage Cap Reductn		0	0	0	0		0		0	0	
Reduced v/c Ratio		0.90	0.26	0.01	0.40		0.06		0.20	0.17	
Intersection Summary											
Cycle Length: 120											
Actuated Cycle Length: 120											
Offset: 26 (22%), Referenced to phase	se 2:EBTL a	ind 6:WBTL	, Start of Gr	een							
Natural Cycle: 120											
Control Type: Actuated-Coordinated											
Maximum v/c Ratio: 0.90											
Intersection Signal Delay: 11.7	74				tersection L(
Intersection Capacity Utilization 80.49	%			IC	U Level of S	ervice D					
Analysis Period (min) 15	anacity and	ouo may ba	longor								
# 95th percentile volume exceeds of Queue shown is maximum after two percentile volume exceeds of percentile volume exceeds of percentile volume exceeds of Queue shown is maximum after two percentile volume exceeds of percentile volume exceeds of		eue may be	ionger.								
m Volume for 95th percentile queue		l by upstrea	m signal.								
Splits and Phases: 3: Carling & We	estgate SC										
j								∲ ø4			
83 s								37 s			
Ø6 (R)								1 🔊			

3 s

37 s

Background 2024 AM 4: Kirkwood & Carling WB

	4	+	1	Ť	Ļ	~	
Lane Group	WBL	WBT	NBL	NBT	SBT	SBR	
Lane Configurations	ት ት	4 † †	102	↑	<u>††</u>	1	
Traffic Volume (vph)	336	1228	280	307	352	360	
Future Volume (vph)	336	1228	280	307	352	360	
Lane Group Flow (vph)	354	1557	295	323	371	379	
Turn Type	Prot	NA	pm+pt	NA	NA	Perm	
Protected Phases	1	6	3	8	4		
Permitted Phases			8			4	
Detector Phase	1	6	3	8	4	4	
Switch Phase							
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0	
Minimum Split (s)	16.3	35.3	11.0	29.0	29.0	29.0	
Total Split (s)	16.3	58.0	24.0	62.0	38.0	38.0	
Total Split (%)	13.6%	48.3%	20.0%	51.7%	31.7%	31.7%	
Yellow Time (s)	3.7	3.7	3.3	3.3	3.3	3.3	
All-Red Time (s)	2.6	2.6	2.7	2.7	2.7	2.7	
Lost Time Adjust (s)	-2.3	-2.3	-2.0	-2.0	-2.0	-2.0	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	
Lead/Lag	4.0	4.0	Lead	4.0	Lag	Lag	
Lead-Lag Optimize?			Yes		Yes	Yes	
Recall Mode	Nono	C-Max	None	Ped	Ped	Ped	
	None 57.6				21.3	21.3	
Act Effct Green (s)		57.6	54.4	54.4			
Actuated g/C Ratio	0.48	0.48	0.45	0.45	0.26	0.26	
v/c Ratio	0.22	0.69	0.64	0.40	0.42	0.86	
Control Delay	19.5	26.1	20.2	15.3	37.9	51.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	19.5	26.1	20.2	15.3	37.9	51.2	
LOS	В	С	С	В	D	D	
Approach Delay		24.8		17.7	44.6		
Approach LOS		С		В	D		
Queue Length 50th (m)	25.9	104.8	49.1	53.9	37.0	65.3	
Queue Length 95th (m)	35.9	122.7	m70.2	m75.9	51.0	#112.9	
Internal Link Dist (m)		110.3		152.2	73.8		
Turn Bay Length (m)	40.0					22.0	
Base Capacity (vph)	1578	2268	468	862	960	473	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.22	0.69	0.63	0.37	0.39	0.80	
Intersection Summary							
Cycle Length: 120							
Actuated Cycle Length: 120							
Offset: 66 (55%), Referenced to pha	se 6:WBT, S	tart of Gree	n				
Natural Cycle: 80							
Control Type: Actuated-Coordinated							
Maximum v/c Ratio: 0.86							
Intersection Signal Delay: 28.0				In	tersection L	OS: C	
Intersection Capacity Utilization 84.4	%			IC	U Level of S	Service E	
Analysis Period (min) 15							
# 95th percentile volume exceeds	capacity, que	eue may be	longer.				
Queue shown is maximum after the		540 maj 20	longon				
m Volume for 95th percentile queu		by upstrea	m signal.				
Splits and Phases: 4: Kirkwood &	Carlina WB						
✓Ø1					<mark>≜ ø</mark> 3		
16.3 s					24 s		

	[™] Ø3 ¥ Ø4
16.3 s	24 s 38 s
, ←	™ ¶ ø8
58 s	62 s

Background 2024 AM 5: Merivale & Thames

	٦	-	\mathbf{F}	1	+	×.	1	†	1	1	Ŧ	~
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		\$			\$			4î b			4î b	
Traffic Volume (veh/h)	11	0	9	2	0	4	21	747	1	1	536	16
Future Volume (Veh/h)	11	0	9	2	0	4	21	747	1	1	536	16
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	12	0	9	2	0	4	22	786	1	1	564	17
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)											184	
pX, platoon unblocked											101	
vC, conflicting volume	1016	1406	290	1124	1414	394	581			787		
vC1, stage 1 conf vol	1010	1100	270	1121		071	001			101		
vC2, stage 2 conf vol												
vCu, unblocked vol	1016	1406	290	1124	1414	394	581			787		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	,10	010	017	710	010	017						
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	94	100	99	99	100	99	98			100		
cM capacity (veh/h)	188	135	706	155	133	606	989			828		
							707			020		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	21	6	415	394	283	299						_
Volume Left	12	2	22	0	1	0						
Volume Right	9	4	0	1	0	17						
cSH	274	308	989	1700	828	1700						
Volume to Capacity	0.08	0.02	0.02	0.23	0.00	0.18						
Queue Length 95th (m)	1.9	0.5	0.5	0.0	0.0	0.0						
Control Delay (s)	19.2	16.9	0.7	0.0	0.0	0.0						
Lane LOS	С	С	А		А							
Approach Delay (s)	19.2	16.9	0.4		0.0							
Approach LOS	С	С										
Intersection Summary												
Average Delay			0.6									
Intersection Capacity Utilization			47.8%	ICI	J Level of S	ervice			А			
Analysis Period (min)			15									

Background 2024 PM 1: Kirkwood & Carling EB

1: Kirkwood & Carling EE							
	٦	-	\rightarrow	†	1	1	÷
Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Configurations	1	₽₽₽	1	<u>††</u>	1	7	1
Traffic Volume (vph)	419	1232	330	328	258	311	372
Future Volume (vph)	419	1232	330	328	258	311	372
Lane Group Flow (vph)	392	1346	347	345	272	327	392
Turn Type	Perm	NA	Perm	NA	Perm	pm+pt	NA
Protected Phases		2		8		7	4
Permitted Phases	2	0	2	0	8	4	
Detector Phase	2	2	2	8	8	7	4
Switch Phase	10.0	10.0	10.0	10.0	10.0	ГО	10.0
Minimum Initial (s)	10.0 29.2	10.0 29.2	10.0 29.2	10.0 26.1	10.0 26.1	5.0 10.1	10.0 26.1
Minimum Split (s)	29.2 61.0	29.2 61.0	29.2 61.0	20.1	20.1	30.0	20.1 59.0
Total Split (s) Total Split (%)	50.8%	50.8%	50.8%	29.0 24.2%	29.0 24.2%	30.0 25.0%	59.0 49.2%
Yellow Time (s)	30.8%	30.8%	30.8%	3.3	3.3	3.3	49.2 <i>%</i> 3.3
All-Red Time (s)	2.5	2.5	2.5	3.3 2.8	3.3 2.8	3.3 1.8	2.8
Lost Time Adjust (s)	-2.2	-2.2	-2.2	-2.1	-2.1	-1.1	-2.1
Total Lost Time (s)	4.0	4.0	4.0	-2.1	4.0	-1.1	4.0
Lead/Lag	י.ד	т.0	ч.0	Lag	Lag	Lead	т.0
Lead-Lag Optimize?				Yes	Yes	Yes	
Recall Mode	C-Max	C-Max	C-Max	Min	Min	Min	Min
Act Effct Green (s)	58.9	58.9	58.9	24.5	24.5	53.1	53.1
Actuated g/C Ratio	0.49	0.49	0.49	0.20	0.20	0.44	0.44
v/c Ratio	0.55	0.60	0.41	0.50	0.88	0.67	0.50
Control Delay	25.6	23.8	5.9	45.0	74.6	16.9	13.3
Queue Delay	0.3	0.1	0.0	0.0	0.0	0.0	0.0
Total Delay	25.8	23.9	5.9	45.0	74.6	16.9	13.3
LOS	С	С	А	D	E	В	В
Approach Delay		21.2		58.0			14.9
Approach LOS		С		E			В
Queue Length 50th (m)	75.1	88.9	8.8	37.9	62.3	20.1	73.3
Queue Length 95th (m)	110.9	104.8	27.9	52.7	#108.3	90.4	108.0
Internal Link Dist (m)		161.6		158.6			144.7
Turn Bay Length (m)	40.0				90.0		
Base Capacity (vph)	715	2256	844	712	318	500	817
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	51	108	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.63	0.41	0.48	0.86	0.65	0.48
Intersection Summary							
Cycle Length: 120							
Actuated Cycle Length: 120							
Offset: 81 (68%), Referenced to pl	hase 2:EBTL, S	Start of Gree	en				
Natural Cycle: 70							
Control Type: Actuated-Coordinate	ed						
Maximum v/c Ratio: 0.88							
Intersection Signal Delay: 26.6				In	tersection L(DS: C	
Intersection Capacity Utilization 10	08.3%			IC	U Level of S	Service G	
Analysis Period (min) 15							
# 95th percentile volume exceed		eue may be	longer.				
Queue shown is maximum afte	r two cycles.						
Splits and Phases: 1: Kirkwood	& Carling EB						
Ø2 (R)	~					<u>7</u> 4	
61 s					59 s		
					1		
						ð7	
					30 s		

Background 2024 PM 2: Merivale & Carling

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Lane Group	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	†† ₽	<u> </u>	ተተቡ	102	1	1	<u> </u>	<u>+</u>	1
Traffic Volume (vph)	649	430	1550	135	207	245	77	294	122
Future Volume (vph)	649	430	1550	135	207	245	77	294	122
Lane Group Flow (vph)	874	453	1731	142	218	258	81	309	122
Turn Type	NA	pm+pt	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	2	рш+рі 1	6	3	8	I CIIII	7	4	I CIIII
Permitted Phases	2	6	0	J	0	8	1	4	4
Detector Phase	2	1	6	3	8	8	7	4	4
Switch Phase	2	1	U	J	0	0	1	4	4
Minimum Initial (s)	10.0	5.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	29.0	10.4	29.0	11.3	37.7	37.7	11.3	37.7	37.7
Total Split (s)	42.0	20.0	62.0	20.0	38.0	38.0	20.0	38.0	38.0
Total Split (%)	35.0%	16.7%	51.7%	16.7%	31.7%	31.7%	16.7%	31.7%	31.7%
Yellow Time (s)	3.7	3.7	31.778	3.3	3.3	31.778	3.3	31.770	3.3
All-Red Time (s)	2.3	1.7	2.3	3.0	3.3	3.3	3.0	3.4	3.3
Lost Time Adjust (s)	-2.0	-1.4	-2.0	-2.3	-2.7	-2.7	-2.3	-2.7	-2.7
Total Lost Time (s)	-2.0	-1.4	4.0	4.0	4.0	4.0	4.0	-2.7	4.0
Lead/Lag	4.0 Lag	Lead	4.0	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	C-Max	None	C-Max	None	None	None	None	None	None
Act Effct Green (s)	38.0	64.8	64.8	15.0	32.8	32.8	13.0	28.2	28.2
Actuated g/C Ratio	0.32	04.8	04.8	0.12	0.27	0.27	0.11	0.24	0.24
v/c Ratio	0.52	1.06	0.54	0.12	0.27	0.27	0.11	0.24	0.24
Control Delay	27.3	88.0	22.3	66.1	39.7	6.5	57.1	52.9	6.7
Queue Delay	0.7	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.1	88.0	22.5	66.1	39.7	6.5	57.1	52.9	6.7
LOS	20.1 C	60.0 F	22.3 C	E	D	0.5 A	57.1 E	52.7 D	0.7 A
Approach Delay	28.1		36.1	L	31.9	~	L	42.1	~
Approach LOS	20.1 C		50.1 D		C			42.1 D	
Queue Length 50th (m)	35.4	~95.5	105.4	32.1	43.4	0.0	18.1	67.4	0.0
Queue Length 95th (m)	45.7	#178.2	134.6	53.4	64.9	19.4	33.1	92.8	13.0
Internal Link Dist (m)	81.2		139.3	50.1	161.9		50.1	100.7	10.0
Turn Bay Length (m)	01.2	90.0	107.0	40.0	101.7		28.0	100.7	35.0
Base Capacity (vph)	1519	428	2597	226	512	603	20.0	505	510
Starvation Cap Reductn	325	420	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	189	0	0	0	0	0	4
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	1.06	0.72	0.63	0.43	0.43	0.36	0.61	0.25
Intersection Summary	05			2.00	2.10		2.00	2.0.	0.20
Cycle Length: 120 Actuated Cycle Length: 120 Offset: 15 (13%), Referenced to p Natural Cycle: 110		nd 6:WBTL,	Start of Gree	en					
Control Type: Actuated-Coordinate	ed								
Maximum v/c Ratio: 1.06									
Intersection Signal Delay: 34.5	(00)				ersection LC				
Intersection Capacity Utilization 86	6.3%			IC	U Level of S	ervice E			
Analysis Period (min) 15									
 Volume exceeds capacity, que 		ally infinite.							
Queue shown is maximum afte									
# 95th percentile volume exceed		eue may be	longer.						
Queue shown is maximum afte	er two cycles.								
Splits and Phases: 2: Merivale	& Carling								
	<u> </u>							4	
🖸 🧭 🎽 📥	Ø2 (R)				1	Ø3		¥ Ø4	

√ Ø1	→ø2 (R)	* Ø3	∲ Ø4
20 s	42 s	20 s	38 s
₩ Ø6 (R)		₩ø7	Ø8
62 s		20 s	38 s

Background 2024 PM 3: Carling & Westgate SC

	\$	≯	→	∢	-	1	Ť	5	Ļ	4	
Lane Group	EBU	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR	
Lane Configurations		Ă	ተተኈ	۲	ተተኈ		4		ب ا	1	
Traffic Volume (vph)	41	230	722	1	1679	10	3	127	4	138	
Future Volume (vph)	41	230	722	1	1679	10	3	127	4	138	
Lane Group Flow (vph)	0	285	768	1	1924	0	18	0	138	145	
Turn Type	pm+pt	pm+pt	NA	Perm	NA	Perm	NA	Perm	NA	Perm	
Protected Phases	5	5	2		6		8		4		
Permitted Phases	2	2	0	6	,	8	0	4		4	
Detector Phase	5	5	2	6	6	8	8	4	4	4	
Switch Phase	F 0	ГО	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	
Minimum Initial (s)	5.0 10.6	5.0 10.6	10.0 23.6	10.0 23.6	10.0 23.6	10.0 37.0	10.0 37.0	10.0 37.0	10.0 37.0	10.0 37.0	
Minimum Split (s)				23.6 59.0	23.6 59.0	37.0 37.0				37.0	
Total Split (s) Total Split (%)	24.0 20.0%	24.0 20.0%	83.0 69.2%	59.0 49.2%	59.0 49.2%	37.0	37.0 30.8%	37.0 30.8%	37.0 30.8%	37.0	
Yellow Time (s)	3.7	20.0%	3.7	49.2 <i>%</i> 3.7	49.2%	30.8%	30.8%	30.8%	30.8%	30.8%	
All-Red Time (s)	1.9	1.9	1.9	1.9	1.9	4.0	4.0	4.0	4.0	4.0	
Lost Time Adjust (s)	1.7	-1.6	-1.6	-1.6	-1.6	4.0	-3.0	4.0	-3.0	-3.0	
Total Lost Time (s)		4.0	4.0	4.0	4.0		4.0		4.0	4.0	
Lead/Lag	Lead	Lead	4.0	Lag	Lag		4.0		4.0	4.0	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes						
Recall Mode	None	None	C-Max	C-Max	C-Max	None	None	None	None	None	
Act Effct Green (s)	None	89.7	89.7	65.3	65.3	None	22.3	None	22.3	22.3	
Actuated g/C Ratio		0.75	0.75	0.54	0.54		0.19		0.19	0.19	
v/c Ratio		0.82	0.21	0.00	0.74		0.07		0.60	0.37	
Control Delay		59.9	2.9	7.0	10.3		30.8		54.1	8.6	
Queue Delay		0.0	0.0	0.0	0.1		0.0		0.0	0.0	
Total Delay		59.9	2.9	7.0	10.3		30.8		54.1	8.6	
LOS		E	А	А	В		С		D	А	
Approach Delay			18.3		10.3		30.8		30.8		
Approach LOS			В		В		С		С		
Queue Length 50th (m)		49.8	9.6	0.0	22.8		2.8		30.3	0.0	
Queue Length 95th (m)		m#97.1	m16.1	m0.0	98.2		8.1		45.7	15.1	
Internal Link Dist (m)			220.3		81.2		10.8		75.6		
Turn Bay Length (m)		70.0		36.0							
Base Capacity (vph)		367	3631	328	2608		390		343	505	
Starvation Cap Reductn		0	0	0	53		0		0	0	
Spillback Cap Reductn		0	0	0	0		0		0	0	
Storage Cap Reductn		0	0 0.21	0	0 0.75		0		0	0 0.29	
Reduced v/c Ratio		0.78	0.Z I	0.00	0.75		0.05		0.40	0.29	
Intersection Summary											
Cycle Length: 120											
Actuated Cycle Length: 120											
Offset: 3 (3%), Referenced to phase	e 2:EBTL and	I 6:WBTL, S	tart of Gree	n							
Natural Cycle: 90 Control Type: Actuated Coordinates	4										
Control Type: Actuated-Coordinated Maximum v/c Ratio: 0.82	1										
Intersection Signal Delay: 14.8				In	tersection L	JC+ B					
Intersection Capacity Utilization 103	3.2%				U Level of S						
Analysis Period (min) 15	J.Z /U			iC							
# 95th percentile volume exceeds	capacity ou	eue may be	longer								
Queue shown is maximum after		ouo may bo	longer.								
m Volume for 95th percentile que		l by upstrea	m signal.								
Splits and Phases: 3: Carling & W	Vestgate SC										
								∲ ø4			
83 s								37 s			
≯ _{Ø5}	🗸 Ø6 (R)							▲ Ø8			
24 c	50 c							27 c			

59 s

Background 2024 PM 4: Kirkwood & Carling WB

	4	+	•	Ť	Ļ	-	
ane Group	WBL	WBT	NBL	NBT	SBT	SBR	
ane Configurations	ሻሻ	ተተቡ	۲	1	<u>†</u> †	1	
raffic Volume (vph)	200	2320	227	545	481	410	
uture Volume (vph)	200	2320	227	545	481	410	
ane Group Flow (vph)	211	2774	239	574	506	432	
urn Type	Perm	NA	pm+pt	NA	NA	Perm	
otected Phases		6	3	8	4		
ermitted Phases	6		8			4	
etector Phase	6	6	3	8	4	4	
witch Phase							
linimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0	
inimum Split (s)	35.3	35.3	11.0	29.0	29.0	29.0	
otal Split (s)	67.0	67.0	20.0	53.0	33.0	33.0	
otal Split (%)	55.8%	55.8%	16.7%	44.2%	27.5%	27.5%	
ellow Time (s)	3.7	3.7	3.3	3.3	3.3	3.3	
-Red Time (s)	2.6	2.6	2.7	2.7	2.7	2.7	
st Time Adjust (s)	-2.3	-2.3	-2.0	-2.0	-2.0	-2.0	
tal Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	
ad/Lag	1.0	1.0	Lead	1.0	Lag	Lag	
ad-Lag Optimize?			Yes		Yes	Yes	
call Mode	C-Max	C-Max	None	Ped	Ped	Ped	
t Effct Green (s)	63.0	63.0	49.0	49.0	29.5	29.5	
tuated g/C Ratio	0.52	0.52	0.41	0.41	0.25	0.25	
: Ratio	0.12	1.11	0.71	0.79	0.23	1.05	
ntrol Delay	6.8	76.7	34.1	39.8	43.9	93.6	
eue Delay	0.0	0.0	0.0	5.2	0.0	0.0	
tal Delay	6.8	76.7	34.1	45.0	43.9	93.6	
S	A	, o.,	C	43.0 D	43.7 D	75.0 F	
proach Delay		71.8	U	41.8	66.8		
broach LOS		71.0 E		41.0 D	60.0 E		
eue Length 50th (m)	5.1	~278.7	47.4	135.6	56.2	~96.0	
eue Length 95th (m)	m7.4	#306.6	65.6	177.8	74.2	#158.3	
ernal Link Dist (m)	117.4	113.3	55.0	144.7	73.8		
rn Bay Length (m)	40.0	110.0			70.0	22.0	
se Capacity (vph)	1715	2493	345	728	834	412	
arvation Cap Reductn	0	0	0	102	0	0	
illback Cap Reductn	0	0	0	0	0	0	
prage Cap Reductn	0	0	0	0	0	0	
educed v/c Ratio	0.12	1.11	0.69	0.92	0.61	1.05	
	0.12	1.11	0.07	0.72	0.01	1.05	
ersection Summary							
cle Length: 120 tuated Cycle Length: 120 set: 39 (33%), Referenced to pha tural Cycle: 100 ntrol Type: Actuated-Coordinated		Start of Gre	en				
aximum v/c Ratio: 1.11	J						
				In	tersection L	OS E	
ersection Signal Delay: 65.6 ersection Capacity Utilization 108	2.2%				CU Level of S		
	J.J 70			IC	O Level OI	Selvice G	
alysis Period (min) 15	in is theoretic	ally infinite					
Volume exceeds capacity, queu		any minine.					
Queue shown is maximum after		ouo moute	longor				
95th percentile volume exceeds		eue may be	ionger.				
Queue shown is maximum after		hu unater -	molanal				
Volume for 95th percentile que	ue is metered	i by upstrea	m signal.				
olits and Phases: 4: Kirkwood &	Carling WB						
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						1 Ø3 20 s	∀ Ø4 33 s
-						20 5	558

Ø6 (R)

Background 2024 PM 5: Merivale & Thames

	٦	-	\mathbf{F}	1	+	×.	1	†	1	1	Ŧ	~
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		¢			\$			4î b			4î b	
Traffic Volume (veh/h)	8	0	22	0	0	3	22	576	2	4	873	28
Future Volume (Veh/h)	8	0	22	0	0	3	22	576	2	4	873	28
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	8	0	23	0	0	3	23	606	2	4	919	29
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)											186	
pX, platoon unblocked											100	
vC, conflicting volume	1294	1596	474	1144	1609	304	948			608		
vC1, stage 1 conf vol	1271	1070	17.1		1007	001	710			000		
vC2, stage 2 conf vol												
vCu, unblocked vol	1294	1596	474	1144	1609	304	948			608		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	1.5	0.5	0.7	7.5	0.5	0.7	7.1			7.1		
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	93	100	96	100	100	100	97			100		
cM capacity (veh/h)	116	100	537	144	100	692	720			966		
							720			900		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	31	3	326	305	464	488						
Volume Left	8	0	23	0	4	0						
Volume Right	23	3	0	2	0	29						
cSH	278	692	720	1700	966	1700						
Volume to Capacity	0.11	0.00	0.03	0.18	0.00	0.29						
Queue Length 95th (m)	2.8	0.1	0.8	0.0	0.1	0.0						
Control Delay (s)	19.6	10.2	1.1	0.0	0.1	0.0						
Lane LOS	С	В	А		А							
Approach Delay (s)	19.6	10.2	0.6		0.1							
Approach LOS	С	В										
Intersection Summary												
Average Delay			0.6									
Intersection Capacity Utilization			49.1%	ICI	J Level of S	ervice			А			
Analysis Period (min)			15									



ITE Vehicle Trip Generation Rates

Land Use	Data Source	Trip Rate			
	Data Source	AM Peak	PM Peak		
Specialty Retail	ITE 826	1.36	2.71		
Residential Condominium	ITE 230	0.44	0.52		

Modified Person Trip Generation Rates

Land Use	Data Source	Person Trip Rate			
Land Ose	Data Source	AM Peak	PM Peak		
Specialty Retail	ITE 826	1.76	3.52		
Residential Condominium	ITE 230	0.57	0.68		

Note: 1.3 factor to account for typical North American auto occupancy values of approximately 1.15 and combined transit and non-motorized modal shares of less than 10%

ITE Fitted Curve Equations

Land Use	Data Source	Fitted Curve Equation							
	Data Source		AM Peak			PM Peak			
Specialty Retail	ITE 826	T=	1.20(x)	+ 10.74	T=	2.40(x)	+ 21.48		
Residential Condominium	ITE 230	Ln(T)=	0.80Ln(x)	+ 0.26	Ln(T)=	0.82Ln(x)	+ 0.32		

Modified Person Trip Generation

Land Use	Data Source	Area	AM P	eak (Person Tri	ps/hr)	PM Peak (Person Trips/hr)		
			In	Out	Total	In	Out	Total
		ft²	56%	44%		44%	56%	
Specialty Retail	ITE 826	26,232 ft ²	30	25	55	48	62	110
		Units	17%	83%		67%	33%	
Residential Condominium	ITE 230	914 du	66	328	394	321	159	480
		Total	96	353	449	369	221	590

Specialty Retail Trip Generation

Travel Mode	Mode Share	AM P	eak (Person Tri	ps/hr)	PM Peak (Person Trips/hr)		
		In	Out	Total	In	Out	Total
Auto Driver	50%	15	13	28	24	31	55
Auto Passenger	15%	5	4	9	8	10	18
Transit	15%	4	3	7	7	9	16
Non-motorized	20%	6	5	11	9	12	21
Total Person Trips	100%	30	25	55	48	62	110
Less Pass-by (25%)		-4	-4	-8	-7	-7	-14
Total 'New' Specialty Retail Auto Trips		11	9	20	17	24	41

Residential Condominium Trip Generation

Travel Mode	Mode Share	AM P	eak (Person Tri	ps/hr)	PM Peak (Person Trips/hr)		
		In	Out	Total	In	Out	Total
Auto Driver	50%	33	164	197	161	80	241
Auto Passenger	10%	7	33	40	32	16	48
Transit	25%	17	82	99	80	40	120
Non-motorized	15%	9	49	58	48	23	71
Total Person Trips	100%	66	328	394	321	159	480
Total 'New' Residential Condominium Auto Trips		33	164	197	161	80	241

Total Site Vehicle Trip Generation

Travel Mode		AM Peak (veh/h	·)	PM Peak (veh/hr)			
Travel Mode	In	Out	Total	In	Out	Total	
Specialty Retail Trip Generation	15	13	28	24	31	55	
Residential Condominium Trip Generation	33	164	197	161	80	241	
Specialty Retail Pass-by (25%)	-4	-4	-8	-7	-7	-14	
Total 'New' Auto Trips	44	173	217	178	104	282	

Appendix H SYNCHRO Capacity Analysis – Projected 2019

Projected 2019 AM 1: Kirkwood & Carling EB

1: Kirkwood & Carling EB	٨	→	•	1	~	1	Ļ	
	רח	F FDT	•		-		-	
Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT	
Lane Configurations Traffic Volume (vph)	5 187	4↑↑ 1910	7 187	↑↑ 369	7 339	5 344	† 439	
Future Volume (vph)	187	1910	187	369	339	344 344	439	
Lane Group Flow (vph)	177	2031	197	388	357	362	462	
Turn Type	Perm	NA	Perm	NA	Perm	pm+pt	NA	
Protected Phases	1 0111	2	1 01111	8	1 01111	7	4	
Permitted Phases	2		2		8	4		
Detector Phase	2	2	2	8	8	7	4	
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	5.0	10.0	
Minimum Split (s)	29.2	29.2	29.2	26.1	26.1	10.1	26.1	
Total Split (s)	58.0	58.0	58.0	38.0	38.0	24.0	62.0	
Total Split (%)	48.3%	48.3%	48.3%	31.7%	31.7%	20.0%	51.7%	
Yellow Time (s)	3.7	3.7	3.7	3.3	3.3	3.3	3.3	
All-Red Time (s)	2.5	2.5	2.5	2.8	2.8	1.8	2.8	
Lost Time Adjust (s)	-2.2	-2.2	-2.2	-2.1	-2.1	-1.1	-2.1	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lead/Lag				Lag	Lag	Lead		
Lead-Lag Optimize?	C Mari	C Mari	C Merr	Yes	Yes	Yes	N 41	
Recall Mode Act Effct Green (s)	C-Max 55.7	C-Max 55.7	C-Max 55.7	Min 32.3	Min 32.3	Min 56.3	Min 56.3	
Actuated g/C Ratio	0.46	0.46	0.46	32.3 0.27	32.3 0.27	0.47	0.47	
v/c Ratio	0.46	0.40	0.46	0.27	0.27	0.47	0.47	
Control Delay	21.5	42.4	6.6	37.5	64.6	32.5	24.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.5	
Total Delay	21.5	42.4	6.6	37.5	64.6	32.5	25.4	
LOS	C	D	A	D	E	C	C	
Approach Delay	-	37.9		50.5	_	-	28.5	
Approach LOS		D		D			С	
Queue Length 50th (m)	29.6	178.5	6.2	38.9	78.9	73.5	96.5	
Queue Length 95th (m)	48.2	#219.8	20.1	53.2	#127.0	101.9	129.3	
Internal Link Dist (m)		161.6		158.6			152.2	
Turn Bay Length (m)	40.0				90.0			
Base Capacity (vph)	676	2138	746	960	429	474	862	
Starvation Cap Reductn	0	0	0	0	0	0	122	
Spillback Cap Reductn	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.26	0.95	0.26	0.40	0.83	0.76	0.62	
Intersection Summary								
Cycle Length: 120								
Actuated Cycle Length: 120								
Offset: 15 (13%), Referenced to ph	ase 2:EBTL, S	Start of Gree	en					
Natural Cycle: 90								
Control Type: Actuated-Coordinate	d							
Maximum v/c Ratio: 0.95								
Intersection Signal Delay: 38.3					tersection L(
Intersection Capacity Utilization 84	.5%			IC	U Level of S	Service E		
Analysis Period (min) 15								
# 95th percentile volume exceeds		eue may be	longer.					
Queue shown is maximum after	two cycles.							
Splits and Phases: 1: Kirkwood &	& Carling EB				1.			
● Ø2 (R)					€ [™] Ø4			
58 s					62 s			A
					•ø7			₽ø8
					24 s			38 s

Projected 2019 AM 2: Merivale & Carling

	-	4	+	1	Ť	*	1	Ŧ	~	
Lane Group	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	<u>ተተኑ</u>	<u>102</u>	<u>ተተኑ</u>	102	1	1	<u> </u>	1	1	
Traffic Volume (vph)	957	185	584	163	239	352	29	270	238	
Future Volume (vph)	957	185	584	163	239	352	29	270	238	
Lane Group Flow (vph)	1110	195	652	172	252	371	31	284	251	
Turn Type	NA	pm+pt	NA	Prot	NA	Perm	Prot	NA	Perm	
Protected Phases	2	1	6	3	8		7	4		
Permitted Phases		6				8			4	
Detector Phase	2	1	6	3	8	8	7	4	4	
Switch Phase										
Minimum Initial (s)	10.0	5.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	
Minimum Split (s)	29.0	10.4	29.0	11.3	37.7	37.7	11.3	37.7	37.7	
Total Split (s)	49.0	12.0	61.0	21.0	38.0	38.0	21.0	38.0	38.0	
Total Split (%)	40.8%	10.0%	50.8%	17.5%	31.7%	31.7%	17.5%	31.7%	31.7%	
Yellow Time (s)	3.7	3.7	3.7	3.3	3.3	3.3	3.3	3.3	3.3	
All-Red Time (s)	2.3	1.7	2.3	3.0	3.4	3.4	3.0	3.4	3.4	
Lost Time Adjust (s)	-2.0	-1.4	-2.0	-2.3	-2.7	-2.7	-2.3	-2.7	-2.7	
Total Lost Time (s)	4.0 Lag	4.0 Lead	4.0	4.0 Lead	4.0	4.0	4.0 Lead	4.0 Lag	4.0	
Lead/Lag Lead-Lag Optimize?	Yes	Yes		Yes	Lag Yes	Lag Yes	Yes	Yes	Lag Yes	
Recall Mode	C-Max	None	C-Max	None	None	None	None	None	None	
Act Effct Green (s)	48.1	64.5	64.5	16.3	38.4	38.4	10.0	27.2	27.2	
Actuated g/C Ratio	0.40	0.54	0.54	0.14	0.32	0.32	0.08	0.23	0.23	
v/c Ratio	0.58	0.70	0.25	0.74	0.44	0.54	0.22	0.70	0.54	
Control Delay	24.1	33.1	15.8	69.8	35.5	9.3	54.3	51.8	15.3	
Queue Delay	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	24.5	33.1	15.8	69.8	35.5	9.3	54.3	51.8	15.3	
LOS	С	С	В	E	D	А	D	D	В	
Approach Delay	24.5		19.8		30.7			35.8		
Approach LOS	С		В		С			D		
Queue Length 50th (m)	53.2	23.7	29.1	39.2	48.9	9.5	7.0	61.4	12.8	
Queue Length 95th (m)	67.6	#63.4	41.3	#69.1	71.0	36.1	16.3	84.9	35.3	
Internal Link Dist (m)	89.4		139.3		159.9			100.7		
Turn Bay Length (m)		90.0		40.0			28.0		35.0	
Base Capacity (vph)	1923	280	2585	240	571	681	240	505	540	
Starvation Cap Reductn	350	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	0.71	0.70	0.25	0.72	0.44	0.54	0.13	0.56	0.46	
ntersection Summary										
Cycle Length: 120										
Actuated Cycle Length: 120										
Offset: 54 (45%), Referenced to p	ohase 2:EBT an	d 6:WBTL,	Start of Gree	en						
Natural Cycle: 90										
Control Type: Actuated-Coordinat	ted									
Maximum v/c Ratio: 0.74										
ntersection Signal Delay: 26.7	3 50/				ersection LO					
ntersection Capacity Utilization 7	7.5%			IC	U Level of S	ervice D				
Analysis Period (min) 15	de concelha ava		lanara							
95th percentile volume exceed Queue shown is maximum after		eue may be	ionger.							
Splits and Phases: 2: Merivale	& Carling									
· · · · · · · · · · · · · · · · · · ·	9				-					_
🖌 Ø1 🕴 🚽 Ø2 (R)					۰ و	ð3		🖣 Ø4		
12 s <mark>4</mark> 9 s					21 s			38 s		
Z (06 (D) -						*7		1		
🗸 Ø6 (R) 🏮					•	77		∲Ø8		
61 S					21 s			38 s		

Projected 2019 AM 3: Carling & Westgate SC

	_	٦	→	∢	-	1	Ť	5	Ŧ	1	
Lane Group	EBU	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR	
Lane Configurations		N.	ተተኈ	۲	ተተኈ		\$		ب ا	1	
Traffic Volume (vph)	103	262	948	2	780	16	2	45	0	62	
Future Volume (vph)	103	262	948	2	780	16	2	45	0	62	
Lane Group Flow (vph)	0	384	1012	2	899	0	24	0	47	65	
Turn Type	Perm	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	
Protected Phases			2		6		8		4		
Permitted Phases	2	2		6		8		4		4	
Detector Phase	2	2	2	6	6	8	8	4	4	4	
Switch Phase	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	23.6 83.0	23.6	23.6 83.0	23.6 83.0	23.6 83.0	37.0 37.0	37.0	37.0	37.0	37.0 37.0	
Total Split (s)	69.2%	83.0 69.2%	69.2%	69.2%	69.2%	37.0	37.0 30.8%	37.0 30.8%	37.0 30.8%	37.0	
Total Split (%) Yellow Time (s)	09.2% 3.7	3.7	3.7	3.7	3.7	30.8%	30.8%	30.8%	30.8%	30.8%	
All-Red Time (s)	3.7 1.9	3.7 1.9	3.7 1.9	3.7 1.9	3.7 1.9	3.0 4.0	3.0 4.0	3.0 4.0	3.0 4.0	3.0 4.0	
Lost Time Adjust (s)	1.7	-1.6	-1.6	-1.6	-1.6	4.0	-3.0	4.0	-3.0	-3.0	
Total Lost Time (s)		-1.8	-1.0	-1.0	-1.0		-3.0 4.0		-3.0	-3.0	
Lead/Lag		4.0	4.0	4.0	4.0		4.0		4.0	4.0	
Lead-Lag Optimize?											
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None	None	
Act Effct Green (s)	G-IWIAA	98.9	98.9	98.9	98.9	NUILC	17.3	NOTIC	17.3	17.3	
Actuated g/C Ratio		0.82	0.82	0.82	0.82		0.14		0.14	0.14	
v/c Ratio		0.88	0.25	0.01	0.23		0.12		0.25	0.24	
Control Delay		24.5	2.0	5.0	3.5		35.6		46.2	11.2	
Queue Delay		0.0	0.0	0.0	0.1		0.0		0.0	0.0	
Total Delay		24.5	2.0	5.0	3.6		35.6		46.2	11.2	
LOS		С	A	А	A		D		D	В	
Approach Delay			8.1		3.6		35.6		25.9		
Approach LOS			А		А		D		С		
Queue Length 50th (m)		32.4	6.6	0.1	16.4		4.1		10.4	0.0	
Queue Length 95th (m)		m#121.8	m17.3	m0.4	30.9		10.0		18.1	10.5	
Internal Link Dist (m)			168.6		89.4		10.8		75.6		
Turn Bay Length (m)		70.0		36.0							
Base Capacity (vph)		436	4005	388	3940		380		357	453	
Starvation Cap Reductn		0	0	0	1532		0		0	0	
Spillback Cap Reductn		0	0	0	0		0		0	0	
Storage Cap Reductn		0	0	0	0		0		0	0	
Reduced v/c Ratio		0.88	0.25	0.01	0.37		0.06		0.13	0.14	
Intersection Summary											
Cycle Length: 120											
Actuated Cycle Length: 120 Offset: 26 (22%), Referenced to phas	e 2:EBTL	and 6:WBTL	, Start of Gr	een							
Natural Cycle: 120											
Control Type: Actuated-Coordinated											
Maximum v/c Ratio: 0.88				l mi	harraakian I (
Intersection Signal Delay: 7.6 Intersection Capacity Utilization 81.19	/				tersection L(U Level of S						
Analysis Period (min) 15	'U			iC	U LEVELUI S	EI VICE D					
# 95th percentile volume exceeds c	anacity or	ielle may bo	longer								
Queue shown is maximum after tw		ieue may be	ionger.								
m Volume for 95th percentile queue		d by upstrea	m signal.								
Splits and Phases: 3: Carling & We	estgate SC										
₩ø2 (R)								∲ ø4			
83 s								37 s ⊲.†			
ø ₩ Ø6 (R)								Ø8			

3 s

37 s

Projected 2019 AM 4: Kirkwood & Carling WB

	¥	+	•	Ť	Ŧ	~
Lane Group	WBL	WBT	NBL	NBT	SBT	SBR
Lane Configurations	ካካ	ተተቡ	1	1	† †	1
Traffic Volume (vph)	344	1179	280	307	352	360
Future Volume (vph)	344	1179	280	307	352	360
Lane Group Flow (vph)	362	1505	295	323	371	379
Turn Type	Prot	NA	pm+pt	NA	NA	Perm
Protected Phases	1	6	3	8	4	
Permitted Phases			8			4
Detector Phase	1	6	3	8	4	4
Switch Phase						
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	16.3	35.3	11.0	29.0	29.0	29.0
Total Split (s)	58.0	58.0	24.0	62.0	38.0	38.0
Total Split (%)	48.3%	48.3%	20.0%	51.7%	31.7%	31.7%
Yellow Time (s)	3.7	3.7	3.3	3.3	3.3	3.3
All-Red Time (s)	2.6	2.6	2.7	2.7	2.7	2.7
Lost Time Adjust (s)	-2.3	-2.3	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	U.F	ч.u	Lead	ч.u	Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	C-Max	None	Ped	Ped	Ped
Act Effct Green (s)	57.6	57.6	54.4	54.4	31.3	31.3
Actuated g/C Ratio	57.6 0.48	0.48	54.4 0.45	54.4 0.45	31.3 0.26	31.3 0.26
v/c Ratio	0.48	0.48	0.45	0.45	0.26	0.26
Control Delay	19.5	25.4	20.2	15.3	37.9	50.7
Queue Delay	0.0	25.4 0.0	20.2	0.0	37.9 0.0	50.7 0.0
Total Delay	0.0 19.5	0.0 25.4	20.2	0.0 15.3	0.0 37.9	0.0 50.7
LOS Approach Dolou	В	C	С	B	D	D
Approach Delay		24.2		17.7	44.4	
Approach LOS	<u>а</u> / г	C 00 2	10.1	B	D	(4.0
Queue Length 50th (m)	26.5	99.3	49.1	53.9	37.0	64.8 #112.1
Queue Length 95th (m)	36.7	116.7	m70.2	m75.9	51.0	#112.1
Internal Link Dist (m)	40.0	110.3		152.2	73.8	22.0
Turn Bay Length (m)	40.0	22/7	440	0/0	0/0	22.0
Base Capacity (vph)	1579	2267	468	862	960	475
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.66	0.63	0.37	0.39	0.80
Intersection Summary						
Cycle Length: 120						
Actuated Cycle Length: 120						
Offset: 66 (55%), Referenced to ph	ase 6.WBT S	tart of Gree	n			
Natural Cycle: 80	ase 0.001, 5		11			
Control Type: Actuated-Coordinate	d					
Maximum v/c Ratio: 0.85	u					
Intersection Signal Delay: 27.7				In	tersection L	
Intersection Capacity Utilization 84.	F0/				U Level of S	
Analysis Period (min) 15	J /0			iC	O LEVELUI 3	DEI VILE E
	canacity and	ouo movika	longer			
# 95th percentile volume exceeds		eue may be	ionger.			
Queue shown is maximum after			a alar -l			
m Volume for 95th percentile que	ue is metered	by upstrea	m signal.			
Splits and Phases: 4: Kirkwood &	& Carling WB					
	U				•	
√ Ø1					[▲] øз	

√ Ø1	Ø 3	🗣 Ø4
58 s	24 s	38 s
, ← Ø6 (R)	↑ Ø8	
58 s	62 s	

Projected 2019 AM 5: Merivale & Thames

	٦	-	\mathbf{r}	4	-	×	1	1	1	×	Ļ	~
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		¢			\$			4î b			4î b	
Traffic Volume (veh/h)	11	0	9	2	0	4	23	739	1	1	532	20
Future Volume (Veh/h)	11	0	9	2	0	4	23	739	1	1	532	20
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	12	0	9	2	0	4	24	778	1	1	560	21
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)											184	
pX, platoon unblocked												
vC, conflicting volume	1014	1400	290	1118	1410	390	581			779		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1014	1400	290	1118	1410	390	581			779		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	94	100	99	99	100	99	98			100		
cM capacity (veh/h)	188	136	706	157	134	609	989			834		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	21	6	413	390	281	301						
Volume Left	12	2	24	0	1	0						
Volume Right	9	4	0	1	0	21						
cSH	274	310	989	1700	834	1700						
Volume to Capacity	0.08	0.02	0.02	0.23	0.00	0.18						
Queue Length 95th (m)	1.9	0.4	0.6	0.0	0.0	0.0						
Control Delay (s)	19.2	16.8	0.8	0.0	0.0	0.0						
Lane LOS	C	C	A	0.0	A	0.0						
Approach Delay (s)	19.2	16.8	0.4		0.0							
Approach LOS	C	C	т.0		0.0							
Intersection Summary												
Average Delay			0.6									
Intersection Capacity Utilization			49.2%	ICI	J Level of S	ervice			А			
Analysis Period (min)			15	100		011100						

Projected 2019 PM 1: Kirkwood & Carling EB

	٨	+	*	1	~	ŕ	Ļ		
Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT		
Lane Configurations	<u> </u>	4 ††				<u>30L</u>	<u>الاد</u>		
Traffic Volume (vph)	419	1221	330	328	258	316	372		
Future Volume (vph)	419	1221	330	328	258	316	372		
Lane Group Flow (vph)	392	1334	347	345	272	333	392		
Turn Type	Perm	NA	Perm	NA	Perm	pm+pt	NA		
Protected Phases	T CHI	2	T CITI	8	T CITI	7	4		
Permitted Phases	2	Z	2	U	8	4	7		
Detector Phase	2	2	2	8	8	7	4		
Switch Phase	2	2	2	U	U	1	т		
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	5.0	10.0		
Minimum Split (s)	29.2	29.2	29.2	26.1	26.1	10.1	26.1		
Total Split (s)	61.0	61.0	61.0	29.0	29.0	30.0	59.0		
Total Split (%)	50.8%	50.8%	50.8%	24.2%	24.2%	25.0%	49.2%		
Yellow Time (s)	3.7	3.7	3.7	3.3	3.3	3.3	3.3		
All-Red Time (s)	2.5	2.5	2.5	2.8	2.8	1.8	2.8		
Lost Time Adjust (s)	-2.2	-2.2	-2.2	-2.1	-2.1	-1.1	-2.1		
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0		
_ead/Lag	4.0	4.0	4.0	Lag	Lag	Lead	ч.0		
Lead-Lag Optimize?				Yes	Yes	Yes			
Recall Mode	C-Max	C-Max	C-Max	Min	Min	Min	Min		
Act Effct Green (s)	58.9	58.9	58.9	24.4	24.4	53.1	53.1		
Actuated g/C Ratio	0.49	0.49	0.49	0.20	0.20	0.44	0.44		
v/c Ratio	0.47	0.49	0.47	0.20	0.20	0.44	0.44		
Control Delay	25.6	23.7	5.9	45.1	75.2	16.0	11.5		
Queue Delay	0.3	0.1	0.0	45.1	0.0	0.0	0.0		
Total Delay	25.9	23.8	5.9	45.1	75.2	16.0	11.5		
LOS	2J.7 C	23.0 C	J.9	4J.1 D	7.5.2 E	10.0 B	B		
Approach Delay	C	21.2	~	58.4	L	D	13.6		
Approach LOS		21.2 C		50.4 E			B		
Queue Length 50th (m)	75.1	87.7	8.8	37.9	62.3	16.4	71.9		
Queue Length 95th (m)	110.9	103.5	27.9	52.7	#108.3	67.7	99.6		
nternal Link Dist (m)	110.7	161.6	21.7	158.6	#100.5	07.7	144.7		
Turn Bay Length (m)	40.0	101.0		130.0	90.0		144.7		
Base Capacity (vph)	714	2253	843	709	317	501	817		
Starvation Cap Reductn	0	0	043	0	0	0	0		
Spillback Cap Reductn	51	108	0	0	0	0	0		
Storage Cap Reductn	0	0	0	0	0	0	0		
Reduced v/c Ratio	0.59	0.62	0.41	0.49	0.86	0.66	0.48		
	0.37	0.02	0.41	0.47	0.00	0.00	0.40		
Intersection Summary									
Cycle Length: 120									
Actuated Cycle Length: 120									
Offset: 81 (68%), Referenced to ph	nase 2:EBTL, 3	Start of Gree	en						
Natural Cycle: 70									
Control Type: Actuated-Coordinate	ed								
Maximum v/c Ratio: 0.88									
ntersection Signal Delay: 26.3					tersection L(
ntersection Capacity Utilization 10	8.1%			IC	U Level of S	ervice G			
Analysis Period (min) 15									
# 95th percentile volume exceed		eue may be	longer.						
Queue shown is maximum after	r two cycles.								
Splits and Phases: 1: Kirkwood	& Carling EB				- T T				
🗘 🗇 Ø2 (R)					÷.	04			
61 s					59 s				
) 7		¶ø8	
						1/		708	

Projected 2019 PM 2: Merivale & Carling

2: Merivale & Carling	-	4	+	1	t	1	1	Ļ	4	
Lane Group	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	*††	<u> </u>	*	ň	1	1	1	<u>, 101</u>	1	
Fraffic Volume (vph)	663	446	1537	129	201	245	67	289	122	
uture Volume (vph)	663	446	1537	127	201	245	67	289	122	
ine Group Flow (vph)	891	469	1703	136	212	258	71	304	128	
rn Type	NA	pm+pt	NA	Prot	NA	Perm	Prot	NA	Perm	
otected Phases	2	ρπ+ρι 1	6	3	8	I CIIII	7	4	1 CIIII	
rmitted Phases	Z	6	0	J	U	8	1	4	4	
tector Phase	2	1	6	3	8	8	7	4	4	
itch Phase	2	I	0	J	0	0	1	4	4	
nimum Initial (s)	10.0	5.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	
nimum Split (s)	29.0	10.4	29.0	11.3	37.7	37.7	11.3	37.7	37.7	
tal Split (s)	42.0	20.0	62.0	20.0	38.0	38.0	20.0	38.0	38.0	
al Split (%)	35.0%	16.7%	51.7%	16.7%	31.7%	31.7%	16.7%	31.7%	31.7%	
	35.0%	3.7	31.7%		31.7%	31.7%	3.3	31.7%		
low Time (s)				3.3					3.3	
-Red Time (s)	2.3	1.7	2.3	3.0	3.4	3.4	3.0	3.4	3.4	
t Time Adjust (s)	-2.0	-1.4	-2.0	-2.3	-2.7	-2.7	-2.3	-2.7	-2.7	
al Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
id/Lag	Lag	Lead		Lead	Lag	Lag	Lead	Lag	Lag	
ad-Lag Optimize?	Yes	Yes	0.11	Yes	Yes	Yes	Yes	Yes	Yes	
call Mode	C-Max	None	C-Max	None	None	None	None	None	None	
Effct Green (s)	38.0	65.1	65.1	14.9	32.9	32.9	12.5	28.0	28.0	
uated g/C Ratio	0.32	0.54	0.54	0.12	0.27	0.27	0.10	0.23	0.23	
Ratio	0.59	1.09	0.65	0.65	0.43	0.44	0.40	0.73	0.29	
trol Delay	27.1	99.4	21.8	64.7	39.3	6.5	56.3	52.7	6.7	
ue Delay	0.8	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	
I Delay	27.8	99.4	21.9	64.7	39.3	6.5	56.3	52.7	6.7	
5	С	F	С	E	D	А	E	D	А	
roach Delay	27.8		38.6		31.0			41.5		
roach LOS	С		D		С			D		
eue Length 50th (m)	35.2	~103.9	102.0	30.6	41.9	0.0	15.8	66.3	0.0	
eue Length 95th (m)	45.6	#188.6	131.3	51.5	63.2	19.4	29.6	91.3	13.0	
rnal Link Dist (m)	81.2		139.3		161.9			100.7		
n Bay Length (m)		90.0		40.0			28.0		35.0	
se Capacity (vph)	1520	429	2618	226	510	602	226	505	510	
rvation Cap Reductn	320	0	0	0	0	0	0	0	0	
lback Cap Reductn	0	0	105	0	0	0	0	0	2	
rage Cap Reductn	0	0	0	0	0	0	0	0	0	
luced v/c Ratio	0.74	1.09	0.68	0.60	0.42	0.43	0.31	0.60	0.25	
rsection Summary le Length: 120										
tuated Cycle Length: 120										
fset: 15 (13%), Referenced to p	phase 2:EBT an	d 6:WBTL	Start of Gree	en						
tural Cycle: 110		,								
ntrol Type: Actuated-Coordina	ted									
kimum v/c Ratio: 1.09										
rsection Signal Delay: 35.6				Int	ersection L	DS: D				
section Capacity Utilization 8	36.8%				U Level of S					
lysis Period (min) 15				.0						
Volume exceeds capacity, qu	leue is theoretic	ally infinite								
Queue shown is maximum aft										
95th percentile volume excee		elle mav he	longer							
Queue shown is maximum aft		sac may be	ionger.							
lits and Phases: 2: Merivale	& Carling									
<i>·</i>	₩Ø2 (R)				•	Ø3		∜ Ø4		
s 42					20 s			38 s		
12	-									

√ Ø1	→ Ø2 (R)	\$ Ø3	🖞 Ø4
20 s	42 s	20 s	38 s
Ø6 (R)	,	₩ø7	1øs
62 s		20 s	38 s

Projected 2019 PM 3: Carling & Westgate SC

	1	۶	-	4	-	1	Ť	1	Ļ	-	
Lane Group	EBU	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR	
Lane Configurations		Ä	ተተኈ	۲	<u>↑</u> ↑₽		4		÷.	1	
Traffic Volume (vph)	58	179	753	1	1679	10	3	111	4	143	
Future Volume (vph)	58	179	753	1	1679	10	3	111	4	143	
Lane Group Flow (vph)	0	249	801	1	1904	0	18	0	121	151	
Turn Type	pm+pt	pm+pt	NA	Perm	NA	Perm	NA	Perm	NA	Perm	
Protected Phases	5	5	2		6		8		4		
Permitted Phases	2	2		6		8		4		4	
Detector Phase	5	5	2	6	6	8	8	4	4	4	
Switch Phase											
Minimum Initial (s)	5.0	5.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	10.6	10.6	23.6	23.6	23.6	37.0	37.0	37.0	37.0	37.0	
Total Split (s)	24.0	24.0	83.0	59.0	59.0	37.0	37.0	37.0	37.0	37.0	
Total Split (%)	20.0%	20.0%	69.2%	49.2%	49.2%	30.8%	30.8%	30.8%	30.8%	30.8%	
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	1.9	1.9	1.9	1.9	1.9	4.0	4.0	4.0	4.0	4.0	
Lost Time Adjust (s)		-1.6	-1.6	-1.6	-1.6		-3.0		-3.0	-3.0	
Total Lost Time (s)		4.0	4.0	4.0	4.0		4.0		4.0	4.0	
Lead/Lag	Lead	Lead		Lag	Lag						
Lead-Lag Optimize?	Yes	Yes		Yes	Yes						
Recall Mode	None	None	C-Max	C-Max	C-Max	None	None	None	None	None	
Act Effct Green (s)		90.8	90.8	69.3	69.3		21.2		21.2	21.2	
Actuated g/C Ratio		0.76	0.76	0.58	0.58		0.18		0.18	0.18	
v/c Ratio		0.80	0.22	0.00	0.69		0.07		0.55	0.41	
Control Delay		57.1	2.8	7.0	8.0		31.4		52.9	11.6	
Queue Delay		0.0	0.0	0.0	0.0		0.0		0.0	0.0	
Total Delay		57.1	2.8	7.0	8.0		31.4		52.9	11.6	
LOS		E	A	A	А		С		D	В	
Approach Delay			15.7		8.0		31.4		30.0		
Approach LOS			В		A		С		С		
Queue Length 50th (m)		39.2	10.0	0.0	21.6		2.8		26.6	3.2	
Queue Length 95th (m)		m#75.5	m16.5	m0.0	96.9		8.1		40.2	18.6	
Internal Link Dist (m)			162.3		81.2		10.8		75.6		
Turn Bay Length (m)		70.0		36.0							
Base Capacity (vph)		351	3680	337	2771		391		344	498	
Starvation Cap Reductn		0	0	0	44		0		0	0	
Spillback Cap Reductn		0	0	0	0		0		0	0	
Storage Cap Reductn		0	0	0	0		0		0	0	
Reduced v/c Ratio		0.71	0.22	0.00	0.70		0.05		0.35	0.30	
		•									
Intersection Summary Cycle Length: 120											
Actuated Cycle Length: 120											
Offset: 3 (3%), Referenced to phase	2.FBTL and	A-WRTL S	tart of Gree	n							
Natural Cycle: 90		10.WDTL, 3		11							
Control Type: Actuated-Coordinated	1										
Maximum v/c Ratio: 0.80											
Intersection Signal Delay: 12.5				In	tersection L	JC · D					
Intersection Signal Delay: 12.5	9%				U Level of S						
Analysis Period (min) 15	. 7 70			iC	O LEVELUI 3	CIVICE G					
# 95th percentile volume exceeds	canacity ou	elle may bo	longer								
Queue shown is maximum after		cue may be	ionger.								
m Volume for 95th percentile queu		l by upstrea	m signal.								
Splits and Phases: 3: Carling & W	lestaate SC										
≤ 402 (R)								∲ ø4			
83 s								37 s			
⋬ _{Ø5}	🕈 Ø6 (R)										
24 c	50.0							27.0			

59 s

Projected 2019 PM 4: Kirkwood & Carling WB

	4	+	•	†	Ļ	1	
Lane Group	WBL	WBT	NBL	NBT	SBT	SBR	
Lane Configurations	ካካ	†† ₽	<u>الالا</u>	<u> </u>	1001	<u> </u>	
Traffic Volume (vph)	205	2308	227	545	481	410	
Future Volume (vph)	205	2308	227	545	481	410	
Lane Group Flow (vph)	216	2761	239	574	506	432	
Turn Type	Prot	NA	pm+pt	NA	NA	Perm	
Protected Phases	1	6	3	8	4	1 0.111	
Permitted Phases		-	8	-		4	
Detector Phase	1	6	3	8	4	4	
Switch Phase							
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0	
Minimum Split (s)	16.3	35.3	11.0	29.0	29.0	29.0	
Total Split (s)	67.0	67.0	20.0	53.0	33.0	33.0	
Total Split (%)	55.8%	55.8%	16.7%	44.2%	27.5%	27.5%	
Yellow Time (s)	3.7	3.7	3.3	3.3	3.3	3.3	
All-Red Time (s)	2.6	2.6	2.7	2.7	2.7	2.7	
Lost Time Adjust (s)	-2.3	-2.3	-2.0	-2.0	-2.0	-2.0	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	
Lead/Lag			Lead		Lag	Lag	
Lead-Lag Optimize?			Yes		Yes	Yes	
Recall Mode	None	C-Max	None	Ped	Ped	Ped	
Act Effct Green (s)	63.0	63.0	49.0	49.0	29.5	29.5	
Actuated g/C Ratio	0.52	0.52	0.41	0.41	0.25	0.25	
v/c Ratio	0.13	1.11	0.71	0.79	0.61	1.05	
Control Delay	14.7	83.1	34.1	39.8	43.9	93.6	
Queue Delay	0.0	0.0	0.0	5.2	0.0	0.0	
Total Delay	14.7	83.1	34.1	44.9	43.9	93.6	
LOS	В	F	С	D	D	F	
Approach Delay		78.2		41.7	66.8		
Approach LOS		E		D	E		
Queue Length 50th (m)	12.8	~271.2	47.4	135.6	56.2	~96.0	
Queue Length 95th (m)	19.1	#298.6	65.6	177.8	74.2	#158.3	
Internal Link Dist (m)		113.3		144.7	73.8		
Turn Bay Length (m)	40.0	0.400	0.45	700	004	22.0	
Base Capacity (vph)	1726	2493	345	728	834	412	
Starvation Cap Reductn	0	0	0	102	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.13	1.11	0.69	0.92	0.61	1.05	
Intersection Summary							
Cycle Length: 120							
Actuated Cycle Length: 120							
Offset: 39 (33%), Referenced to pha	ase 6:WBT, S	Start of Gree	n				
Natural Cycle: 100							
Control Type: Actuated-Coordinated							
Maximum v/c Ratio: 1.11							
Intersection Signal Delay: 69.6				Int	ersection L	OS: E	
Intersection Capacity Utilization 108	.1%			IC	U Level of S	Service G	
Analysis Period (min) 15							
~ Volume exceeds capacity, queue	e is theoretic	ally infinite.					
Queue shown is maximum after t							
# 95th percentile volume exceeds		eue may be	longer.				
Queue shown is maximum after t	two cycles.						
Splits and Phases: 4: Kirkwood &	Carling WB						
1						1 Ø3	
√ Ø1						۱Ø3	

√ Ø1	Ø3	∛ Ø4
67 s	20 s	33 s
, ←	≤ ¶ø8	
67 s	53 s	

Projected 2019 PM 5: Merivale & Thames

	۶	-	$\mathbf{\hat{v}}$	4	-	×.	•	Ť	1	>	Ŧ	-
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4			\$			4î îr			4î b	
Traffic Volume (veh/h)	8	0	22	0	0	3	30	564	2	4	870	44
Future Volume (Veh/h)	8	0	22	0	0	3	30	564	2	4	870	44
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	8	0	23	0	0	3	32	594	2	4	916	46
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)											186	
pX, platoon unblocked												
vC, conflicting volume	1311	1607	481	1148	1629	298	962			596		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1311	1607	481	1148	1629	298	962			596		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	93	100	96	100	100	100	96			100		
cM capacity (veh/h)	112	99	531	142	96	698	711			976		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	31	3	329	299	462	504						
Volume Left	8	0	32	0	4	0						
Volume Right	23	3	0	2	0	46						
cSH	270	698	711	1700	976	1700						
Volume to Capacity	0.11	0.00	0.04	0.18	0.00	0.30						
Queue Length 95th (m)	2.9	0.1	1.1	0.0	0.1	0.0						
Control Delay (s)	20.1	10.2	1.5	0.0	0.1	0.0						
Lane LOS	20.1 C	B	A	0.0	A	0.0						
Approach Delay (s)	20.1	10.2	0.8		0.1							
Approach LOS	C	B	0.0		0.1							
Intersection Summary												
Average Delay			0.7									
Intersection Capacity Utilization			55.3%	ICI	J Level of S	ervice			В			
Analysis Period (min)			15	100		01 1100			U			

Appendix I SYNCHRO Capacity Analysis – Modified Projected 2019

Projected 2019 AM - Modified 1: Kirkwood & Carling EB

1: Kirkwood & Carling EE							
	٭	-	\mathbf{r}	†	1	×	Ļ
Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Configurations	۲	₽₽₽	1	<u>††</u>	1	٦	1
Traffic Volume (vph)	187	1910	187	369	339	344	439
Future Volume (vph)	187	1910	187	369	339	344	439
Lane Group Flow (vph)	177	2031	197	388	357	362	462
Turn Type	Perm	NA	Perm	NA	Perm	pm+pt	NA
Protected Phases		2		8		7	4
Permitted Phases	2		2		8	4	
Detector Phase	2	2	2	8	8	7	4
Switch Phase							
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	5.0	10.0
Minimum Split (s)	29.2	29.2	29.2	26.1	26.1	10.1	26.1
Total Split (s)	61.0	61.0	61.0	38.0	38.0	21.0	59.0
Total Split (%)	50.8%	50.8%	50.8%	31.7%	31.7%	17.5%	49.2%
Yellow Time (s)	3.7	3.7	3.7	3.3	3.3	3.3	3.3
All-Red Time (s)	2.5	2.5	2.5	2.8	2.8	1.8	2.8
Lost Time Adjust (s)	-2.2	-2.2	-2.2	-2.1	-2.1	-1.1	-2.1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag				Lag	Lag	Lead	
Lead-Lag Optimize?				Yes	Yes	Yes	
Recall Mode	C-Max	C-Max	C-Max	Min	Min	Min	Min
Act Effct Green (s)	58.7	58.7	58.7	32.3	32.3	53.3	53.3
Actuated g/C Ratio	0.49	0.49	0.49	0.27	0.27	0.44	0.44
v/c Ratio	0.25	0.90	0.25	0.43	0.88	0.84	0.58
Control Delay	19.6	35.2	5.5	37.5	64.6	40.6	26.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.5
Total Delay	19.6	35.2	5.5	37.5	64.6	40.6	27.1
LOS	B	55.2 D	3.5 A	57.5 D	С4.0 Е	40.0 D	C
Approach Delay	D	31.6	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	50.5		U	33.1
Approach LOS		01.0 C		50.5 D			55.1 C
Queue Length 50th (m)	28.2	169.6	5.0	38.9	78.9	63.3	96.3
Queue Length 95th (m)	45.8	#196.6	17.8	53.2	#127.0	#104.1	121.8
Internal Link Dist (m)	-J.U	161.6	17.0	158.6	" 121.0	" IU 1 . I	152.2
Turn Bay Length (m)	40.0	101.0		130.0	90.0		132.2
Base Capacity (vph)	712	2253	782	960	429	432	817
Starvation Cap Reductn	0	0	0	900 0	429	432	107
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.90	0.25	0.40	0.83	0.84	0.65
	0.25	0.70	0.25	0.40	0.05	0.04	0.05
Intersection Summary							
Cycle Length: 120							
Actuated Cycle Length: 120							
Offset: 15 (13%), Referenced to ph	nase 2:EBTL, S	Start of Gree	en				
Natural Cycle: 90							
Control Type: Actuated-Coordinate	ed						
Maximum v/c Ratio: 0.90							
Intersection Signal Delay: 35.5				In	tersection L	OS: D	
Intersection Capacity Utilization 84	.5%				U Level of S		
Analysis Period (min) 15							
# 95th percentile volume exceed	s capacity, qu	eue mav be	longer.				
Queue shown is maximum after							
Splits and Phases: 1: Kirkwood	& Carling EB						
∮ 🗘 Ø2 (R)	<u> </u>				4	Ø4	
61 s					59 s	-	
					1		
						Ø7	
					21 s		

Projected 2019 AM - Modified 2: Merivale & Carling

	-	4	+	-	1	1	*	Ļ	-	
ane Group	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR	
ane Configurations	<u>ተተ</u> ኑ	ň	<u>ተተኑ</u>	5	1	1	7	•	1	
Fraffic Volume (vph)	957	185	584	163	239	352	29	270	238	
Future Volume (vph)	957	185	584	163	239	352	29	270	238	
ane Group Flow (vph)	1110	195	652	172	252	371	31	284	251	
Turn Type	NA	pm+pt	NA	Prot	NA	Perm	Prot	NA	Perm	
Protected Phases	2	1	6	3	8		7	4		
Permitted Phases		6				8			4	
Detector Phase	2	1	6	3	8	8	7	4	4	
Switch Phase	_		-	-	-	-				
Minimum Initial (s)	10.0	5.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	
/inimum Split (s)	29.0	10.4	29.0	11.3	37.7	37.7	11.3	37.7	37.7	
otal Split (s)	49.0	12.0	61.0	21.0	38.0	38.0	21.0	38.0	38.0	
Total Split (%)	40.8%	10.0%	50.8%	17.5%	31.7%	31.7%	17.5%	31.7%	31.7%	
'ellow Time (s)	3.7	3.7	3.7	3.3	3.3	3.3	3.3	3.3	3.3	
II-Red Time (s)	2.3	1.7	2.3	3.0	3.4	3.4	3.0	3.4	3.4	
ost Time Adjust (s)	-2.0	-1.4	-2.0	-2.3	-2.7	-2.7	-2.3	-2.7	-2.7	
otal Lost Time (s)	-2.0	-1.4	-2.0	4.0	4.0	4.0	4.0	4.0	4.0	
.ead/Lag	4.0 Lag	Lead	4.0	Lead	4.0 Lag	4.0 Lag	Lead	Lag	4.0 Lag	
.ead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	C-Max	None	C-Max	None	None	None	None	None	None	
Act Effct Green (s)	48.1	64.5	64.5	16.3	38.4	38.4	10.0	27.2	27.2	
Actuated g/C Ratio	48.1	04.5	04.5	0.14	0.32	38.4 0.32	0.08	0.23	0.23	
/c Ratio	0.40	0.54	0.54	0.14	0.32	0.52	0.08	0.23	0.23	
Control Delay	24.2	33.1	15.8	69.8	35.5	9.3	54.3	51.8	15.3	
	0.4	0.0					0.0	0.0	0.0	
Queue Delay			0.0 15.8	0.0	0.0	0.0		51.8		
otal Delay .OS	24.6 C	33.1 C		69.8	35.5	9.3	54.3		15.3	
		L	B	E	D	А	D	D 35.8	В	
pproach Delay	24.6		19.8		30.7					
pproach LOS	C	00.7	B	20.0	C	0.5	7.0	D	10.0	
Queue Length 50th (m)	53.1	23.7	29.1	39.2	48.9	9.5	7.0	61.4	12.8	
Queue Length 95th (m)	71.9	#63.4	41.3	#69.1	71.0	36.1	16.3	84.9	35.3	
nternal Link Dist (m)	89.4	00.0	139.3	40.0	159.9		20.0	100.7	25.0	
urn Bay Length (m)	1000	90.0	2505	40.0	F71	(01	28.0	ГОГ	35.0	
Base Capacity (vph)	1923	280	2585	240	571	681	240	505	540	
tarvation Cap Reductn	350	0	0	0	0	0	0	0	0	
pillback 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	0.71	0.70	0.25	0.72	0.44	0.54	0.13	0.56	0.46	
ntersection Summary										
ycle Length: 120										
ctuated Cycle Length: 120										
Offset: 54 (45%), Referenced to pl	hase 2:EBT an	d 6:WBTL,	Start of Gree	en						
latural Cycle: 90										
Control Type: Actuated-Coordinate	ed									
Naximum v/c Ratio: 0.74										
ntersection Signal Delay: 26.8				Int	ersection LO	DS: C				
ntersection Capacity Utilization 77	1.5%			IC	U Level of S	ervice D				
nalysis Period (min) 15										
95th percentile volume exceed	Is capacity, que	eue may be	longer.							
Queue shown is maximum afte			-							
Splits and Phases: 2: Merivale &	& Carling									
								4 Ø4		
- I										
🖌 Ø1 🚽 🕶 Ø2 (R)					10	03				
- I					21 s	03		♥ Ø4 38 s		
✔ø1 →ø2 (R)										

Projected 2019 AM - Modified 3: Carling & Westgate SC

Lane Group EBU EBL EBT WBL WBT NBL NBT SBL SBT SBR Lane Configurations 3 111 1 112 2 780 16 2 45 0 62 Future Volume (vph) 103 262 948 2 780 16 2 45 0 62 Lane Group Flow (vph) 0 384 1012 2 899 0 24 0 47 65 Lane Corol Flow (vph) 0 384 1012 2 899 0 24 0 47 65 Permitted Phases 2 2 6 6 8 4 4 4 4 Deteictor Phase 2 2 6 6 8 4 4 4 Deteictor Phase 2 2 6 830 83.0 83.0 83.0 83.0 83.0 83.0 83.0 83.0 83.0	
Traffic Volume (vph) 103 262 948 2 780 16 2 45 0 62 Lane Group Flow (vph) 0 384 1012 2 899 0 24 0 47 65 Turn Type Perm Perm NA Perm NA Perm NA Perm NA Perm Protected Phases 2 6 8 4 4 Permited Phases 2 2 2 6 6 8 4 4 4 Detector Phase 2 2 2 6 6 8 8 4 4 4 Detector Phase 2 2 2 6 6 8 8 4 4 4 Switch Phase 2 2 2 6 6 8 8 4 4 4 Minimum Initial (s) 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.	
Traffic Volume (vph) 103 262 948 2 780 16 2 45 0 62 Lane Group Flow (vph) 0 384 1012 2 899 0 24 0 47 65 Turn Type Perm Perm NA Perm NA Perm NA Perm NA Perm Protected Phases 2 6 8 4 4 Permited Phases 2 2 2 6 6 8 4 4 4 Detector Phase 2 2 2 6 6 8 4 4 4 Detector Phase 2 2 2 6 6 8 8 4 4 4 Switch Phase 2 2 2 6 6 8 8 4 4 4 Minimum Initial (s) 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.	
Lane Group Flow (vph) 0 384 1012 2 899 0 24 0 47 65 Turn Type Perm Perm NA Parm Na	
Lane Group Flow (vph) 0 334 1012 2 899 0 24 0 47 65 Turn Type Perm Perm NA Parm Na Perm Na Perm Na Parm Na	
Turn Type Perm Perm NA Perm Perm Protected Phases 2 2 6 8 4 4 Detector Phase 2 2 6 6 8 8 4 4 4 Winthmin Inital (s) 10.0 </td <td></td>	
Protectiol Phases 2 6 8 4 Permitted Phases 2 2 6 6 8 4 4 Switch Phase 2 2 2 6 6 8 4 4 Switch Phase	
Delector Phase 2 2 2 6 6 8 8 4 4 4 Switch Phase 10.0	
Delector Phase 2 2 2 6 6 8 8 4 4 4 Switch Phase 10.0	
Minimum Initial (s) 10.0	
Minimum Split (s) 23.6 23.6 23.6 23.6 23.6 23.6 23.6 23.6 23.6 37.0 <td></td>	
Minimum Split (s) 23.6 23.6 23.6 23.6 23.6 23.6 23.6 23.6 23.6 37.0 <td></td>	
Total Split (s) 83.0 83.0 83.0 83.0 83.0 83.0 83.0 37.0	
Total Split (%) 69.2% 69.2% 69.2% 69.2% 69.2% 30.8%	
Yellow Time (s) 3.7 3.7 3.7 3.7 3.7 3.7 3.0 3.0 3.0 3.0 3.0 3.0 All-Red Time (s) 1.9 1.9 1.9 1.9 1.9 4.0	
All-Red Time (s) 1.9 1.9 1.9 1.9 1.9 4.0 4.0 4.0 4.0 4.0 Lost Time Adjust (s) -1.6 -1.6 -1.6 -1.6 -1.6 -3.0 -3.0 -3.0 -3.0 Total Lost Time (s) 4.0 1.1 1.0	
Lost Time Adjust (s) -1.6 -1.6 -1.6 -1.6 -3.0 -3.0 -3.0 Total Lost Time (s) 4.0 A.0 D.4.0 C.4.0 8.1 2.0	
Total Lost Time (s) 4.0 0.0 0.0 0.1 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.0 <td></td>	
Lead-Lag Optimize? Recall Mode C-Max C-Max C-Max C-Max None None None None None Cone C-Max C-Max C-Max None None None None None C-Max C-Max C-Max None None None None None C-Max C-Max C-Max C-Max None None None None C-Max C-Max C-Max C-Max None None None None None C-Max C-Max C-Max C-Max None None None None None C-Max C-Max C-Max C-Max C-Max None None None None None None None C-Max C-Max C-Max C-Max None None None None None None None None	
Lead-Lag Optimize? Recall Mode C-Max C-Max C-Max C-Max None None None None None None None Ande Act Eff Green (s) 98.9 98.9 98.9 98.9 98.9 17.3 17.3 17.3 17.3 Actuated g/C Ratio 0.82 0.82 0.82 0.14 0.02 0.25 0.24 0.01 0.23 0.12 0.25 0.24 0.00	
Recall Mode C-Max C-Max C-Max C-Max C-Max None Acta Effct Green (s) 98.9 98.9 98.9 98.9 98.9 98.9 98.9 98.9 0.02 0.14 0.10 0.00	
Act Effct Green (s) 98.9 98.9 98.9 98.9 17.3 17.3 17.3 Actuated g/C Ratio 0.82 0.82 0.82 0.82 0.14 0.14 0.14 V/c Ratio 0.87 0.25 0.01 0.23 0.12 0.25 0.24 Control Delay 23.1 2.4 5.0 3.5 35.5 46.1 11.1 Queue Delay 0.0 0.0 0.0 0.1 0.0 0.0 0.0 Total Delay 23.1 2.4 5.0 3.6 35.5 46.1 11.1 LOS C A A A D D B Approach Delay 8.1 3.6 35.5 25.8 Approach LOS A A A D C Queue Length 50th (m) m#125.8 m22.1 m0.4 30.8 10.0 18.1 10.5 Internal Link Dist (m) m#125.8 m22.1 m0.4 30.8 386 364 464 Starvation Cap Reductin 0 0 0 10.8 75.6	
Actuated g/C Ratio 0.82 0.82 0.82 0.82 0.14 0.14 0.14 V/c Ratio 0.87 0.25 0.01 0.23 0.12 0.25 0.24 Control Delay 23.1 2.4 5.0 3.5 35.5 46.1 11.1 Queue Delay 0.0 0.0 0.0 0.1 0.0 0.0 0.0 Total Delay 23.1 2.4 5.0 3.6 35.5 46.1 11.1 LOS C A A D D B Approach Delay 8.1 3.6 35.5 25.8 Approach LOS A A A D C Queue Length 50th (m) 30.2 4.9 0.1 16.4 4.1 10.4 0.0 Queue Length 95th (m) m#125.8 m22.1 m0.4 30.8 10.0 18.1 10.5 Internal Link Dist (m) 70.0 36.0 386 364 464 Starvation Cap Reductn 0 0 0 1556 0 0 0 </td <td></td>	
v/c Ratio 0.87 0.25 0.01 0.23 0.12 0.25 0.24 Control Delay 23.1 2.4 5.0 3.5 35.5 46.1 11.1 Queue Delay 0.0 0.0 0.0 0.1 0.0 0.0 0.0 Total Delay 23.1 2.4 5.0 3.6 35.5 46.1 11.1 LOS C A A D D B Approach Delay 8.1 3.6 35.5 25.8 Approach LOS A A D C Queue Length 50th (m) 30.2 4.9 0.1 16.4 4.1 10.4 0.0 Queue Length 95th (m) m#125.8 m22.1 m0.4 30.8 10.0 18.1 10.5 Internal Link Dist (m) 70.0 36.0 36.0 386 364 464 Starvation Cap Reductn 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
Control Delay 23.1 2.4 5.0 3.5 35.5 46.1 11.1 Queue Delay 0.0 0.0 0.0 0.1 0.0 0.0 0.0 Total Delay 23.1 2.4 5.0 3.6 35.5 46.1 11.1 LOS C A A A D D B Approach Delay 8.1 3.6 35.5 25.8 Approach LOS A A A D C Queue Length 50th (m) 30.2 4.9 0.1 16.4 4.1 10.4 0.0 Queue Length 95th (m) m#125.8 m22.1 m0.4 30.8 10.0 18.1 10.5 Internal Link Dist (m) m#125.8 m22.1 m0.4 30.8 10.0 18.1 10.5 Base Capacity (wph) 442 4007 390 3968 386 364 464 Starvation Cap Reductn 0 0 0 0 0 0	
Queue Delay 0.0 0.0 0.0 0.1 0.0 0.0 0.0 Total Delay 23.1 2.4 5.0 3.6 35.5 46.1 11.1 LOS C A A A D D B Approach Delay 8.1 3.6 35.5 25.8 A Approach LOS A A A D C C Queue Length 50th (m) 0.4 0.0 <td></td>	
Total Delay 23.1 2.4 5.0 3.6 35.5 46.1 11.1 LOS C A A A D D B Approach Delay 8.1 3.6 35.5 25.8 Approach LOS A A A D C Oueue Length 50th (m) 30.2 4.9 0.1 16.4 4.1 10.4 0.0 Queue Length 95th (m) m#125.8 m22.1 m0.4 30.8 10.0 18.1 10.5 Internal Link Dist (m) 18.1 10.5 168.6 89.4 10.8 75.6 TUrn Bay Length (m) 70.0 36.0 386 364 464	
LOS C A A A D D B Approach Delay 8.1 3.6 35.5 25.8 Approach LOS A A D C Queue Length 50th (m) 30.2 4.9 0.1 16.4 4.1 10.4 0.0 Queue Length 95th (m) m#125.8 m22.1 m0.4 30.8 10.0 18.1 10.5 Internal Link Dist (m) 18.1 10.5 168.6 89.4 10.8 75.6 7	
Approach Delay 8.1 3.6 35.5 25.8 Approach LOS A A D C Queue Length 50th (m) 30.2 4.9 0.1 16.4 4.1 10.4 0.0 Queue Length 95th (m) m#125.8 m22.1 m0.4 30.8 10.0 18.1 10.5 Internal Link Dist (m) 168.6 89.4 10.8 75.6 Turn Bay Length (m) 70.0 36.0	
Approach LOS A A D C Queue Length 50th (m) 30.2 4.9 0.1 16.4 4.1 10.4 0.0 Queue Length 95th (m) m#125.8 m22.1 m0.4 30.8 10.0 18.1 10.5 Internal Link Dist (m) 168.6 89.4 10.8 75.6 Turn Bay Length (m) 70.0 36.0	
Oueue Length 50th (m) 30.2 4.9 0.1 16.4 4.1 10.4 0.0 Queue Length 95th (m) m#125.8 m22.1 m0.4 30.8 10.0 18.1 10.5 Internal Link Dist (m) 168.6 89.4 10.8 75.6 Turn Bay Length (m) 70.0 36.0	
Queue Length 95th (m) m#125.8 m22.1 m0.4 30.8 10.0 18.1 10.5 Internal Link Dist (m) 168.6 89.4 10.8 75.6 75.6 Turn Bay Length (m) 70.0 36.0 75.6	
Internal Link Dist (m) 168.6 89.4 10.8 75.6 Turn Bay Length (m) 70.0 36.0	
Turn Bay Length (m) 70.0 36.0 Base Capacity (vph) 442 4007 390 3968 386 364 464 Starvation Cap Reductn 0 0 0 1556 0 0 0 Spillback Cap Reductn 0 13 0 14 14 14 14 14 14 14 14 14 14 14 14	
Base Capacity (vph) 442 4007 390 3968 386 364 464 Starvation Cap Reductn 0 0 0 1556 0 0 0 Spillback Cap Reductn 0 13 0 0 0 0 0 0 Storage Cap Reductn 0 14 0 14 0 14 14 14 14 14 14 14 14 14 14 14 14 14	
Starvation Cap Reductn 0 0 1556 0 <td></td>	
Spillback Cap Reductn 0 13 0	
Storage Cap Reductn 0	
Reduced v/c Ratio 0.87 0.25 0.01 0.37 0.06 0.13 0.14 Intersection Summary Cycle Length: 120 Actuated Cycle Length: 120	
Intersection Summary Cycle Length: 120 Actuated Cycle Length: 120	
Cycle Length: 120 Actuated Cycle Length: 120	
Cycle Length: 120 Actuated Cycle Length: 120	
Actuated Cycle Length: 120	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.87	
Intersection Signal Delay: 7.5 Intersection LOS: A Intersection Capacity Utilization 69.0% ICU Level of Service C	
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: Carling & Westgate SC	
₩Ø2 (R)	
83 s 37 s	
47 → 1 →	
▼Ø6 (R) Ø8	
83 s 37 s	

- 02 (K)	₹ jut
83 s	37 s
🗸 Ø6 (R)	<\$ ↑ ø8
83 s	37 s

Projected 2019 AM - Modified 4: Kirkwood & Carling WB

4: Kirkwood & Carling WE	4	+	•	Ť	Ļ	~
Lane Group	WBL	WBT	NBL	NBT	SBT	SBR
Lane Configurations	<u></u>	4 † Ъ		• • • • • • • • • • • • • • • • • • •	1	<u> </u>
Traffic Volume (vph)	344	1179	280	307	352	360
Future Volume (vph)	344	1179	280	307	352	360
Lane Group Flow (vph)	326	1541	295	323	371	379
Turn Type	Perm	NA	pm+pt	NA	NA	Perm
Protected Phases		6	3	8	4	
Permitted Phases	6		8			4
Detector Phase	6	6	3	8	4	4
Switch Phase						
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	35.3	35.3	11.0	29.0	29.0	29.0
Total Split (s)	58.0	58.0	24.0	62.0	38.0	38.0
Total Split (%)	48.3%	48.3%	20.0%	51.7%	31.7%	31.7%
Yellow Time (s)	3.7	3.7	3.3	3.3	3.3	3.3
All-Red Time (s)	2.6	2.6	2.7	2.7	2.7	2.7
Lost Time Adjust (s)	-2.3	-2.3	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	C-Max	C-Max	None	Ped	Ped	Ped
Act Effct Green (s)	58.1	58.1	53.9	53.9	30.7	30.7
Actuated g/C Ratio	0.48	0.48	0.45	0.45	0.26	0.26
v/c Ratio	0.46	0.70	0.64	0.40	0.43	0.83
Control Delay	24.4	26.4	20.9	15.9	38.4	47.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.4	26.4	20.9	15.9	38.4	47.2
LOS	С	С	С	В	D	D
Approach Delay		26.0		18.3	42.9	
Approach LOS		С		В	D	
Queue Length 50th (m)	60.5	109.6	50.0	55.0	37.6	63.6
Queue Length 95th (m)	92.7	131.4	m71.6	m77.2	51.0	#100.9
Internal Link Dist (m)		110.3		152.2	73.8	
Turn Bay Length (m)	40.0					22.0
Base Capacity (vph)	706	2192	466	862	960	497
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.70	0.63	0.37	0.39	0.76
Intersection Summary						
Cycle Length: 120						
Actuated Cycle Length: 120		0				
Offset: 66 (55%), Referenced to ph	nase 6:WBTL,	Start of Gre	en			
Natural Cycle: 80						
Control Type: Actuated-Coordinate	ed					
Maximum v/c Ratio: 0.83						
Intersection Signal Delay: 28.5					tersection L	
Intersection Capacity Utilization 84	.5%			IC	U Level of S	Service E
Analysis Period (min) 15						
# 95th percentile volume exceeds		eue may be	longer.			
Queue shown is maximum after						
m Volume for 95th percentile que	eue is metered	l by upstrea	m signal.			
Splits and Phases: 4: Kirkwood 8	& Carling WR					
					Ø3	
					24 s	
+					≜	
🔰 🖗 Ø6 (R)					Ø8	

62 s

58 s

Projected 2019 PM - Modified 1: Kirkwood & Carling EB

1: Kirkwood & Carling El							
	٦	-	\mathbf{r}	†	1	1	Ļ
Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Configurations	٢	4412	1	††	1	ň	1
Traffic Volume (vph)	419	1221	330	328	258	316	372
Future Volume (vph)	419	1221	330	328	258	316	372
Lane Group Flow (vph)	392	1334	347	345	272	333	392
Turn Type	Perm	NA	Perm	NA	Perm	pm+pt	NA
Protected Phases		2		8		7	4
Permitted Phases	2		2		8	4	
Detector Phase	2	2	2	8	8	7	4
Switch Phase							
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	5.0	10.0
Minimum Split (s)	29.2	29.2	29.2	26.1	26.1	10.1	26.1
Total Split (s)	61.0	61.0	61.0	29.0	29.0	30.0	59.0
Total Split (%)	50.8%	50.8%	50.8%	24.2%	24.2%	25.0%	49.2%
Yellow Time (s)	3.7	3.7	3.7	3.3	3.3	3.3	3.3
All-Red Time (s)	2.5	2.5	2.5	2.8	2.8	1.8	2.8
Lost Time Adjust (s)	-2.2	-2.2	-2.2	-2.1	-2.1	-1.1	-2.1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag				Lag	Lag	Lead	
Lead-Lag Optimize?				Yes	Yes	Yes	
Recall Mode	C-Max	C-Max	C-Max	Min	Min	Min	Min
Act Effct Green (s)	58.9	58.9	58.9	24.4	24.4	53.1	53.1
Actuated g/C Ratio	0.49	0.49	0.49	0.20	0.20	0.44	0.44
v/c Ratio	0.55	0.59	0.41	0.50	0.88	0.68	0.50
Control Delay	25.6	23.7	5.1	45.1	75.2	17.1	12.9
Queue Delay	0.4	0.1	0.0	0.0	0.0	0.0	0.0
Total Delay	26.0	23.8	5.1	45.1	75.2	17.1	12.9
LOS	C	C	A	D	E	В	B
Approach Delay	5	21.1		58.4	L	U	14.9
Approach LOS		C		E			В
Queue Length 50th (m)	75.1	87.7	6.3	37.9	62.3	10.3	71.4
Queue Length 95th (m)	110.9	103.5	24.1	52.7	#108.3	93.7	109.6
Internal Link Dist (m)	110.7	161.6	- 1. 1	158.6			144.7
Turn Bay Length (m)	40.0	701.0		100.0	90.0		/
Base Capacity (vph)	714	2253	855	709	317	501	817
Starvation Cap Reductn	0	0	000	0	0	0	0
Spillback Cap Reductn	68	144	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.63	0.41	0.49	0.86	0.66	0.48
	0.01	0.00	0.11	5.47	0.00	0.00	0.10
Intersection Summary							
Cycle Length: 120							
Actuated Cycle Length: 120							
Offset: 81 (68%), Referenced to p	hase 2:EBTL, S	Start of Gree	en				
Natural Cycle: 70							
Control Type: Actuated-Coordinat	ed						
Maximum v/c Ratio: 0.88							
Intersection Signal Delay: 26.5				In	tersection L(DS: C	
Intersection Capacity Utilization 10	04.5%			IC	U Level of S	ervice G	
Analysis Period (min) 15							
# 95th percentile volume exceed		eue may be	longer.				
Queue shown is maximum after	er two cycles.						
Splits and Phases: 1: Kirkwood	& Carling EB						
Ø2 (R)						ð4	
61 s					59 s		
					×,	37	
)/	
L					30 s		

Projected 2019 PM - Modified 2: Merivale & Carling

2: Merivale & Carling	→	4	+	×	Ť	1	1	ţ	1	
ane Group	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR	
ane Configurations	<u></u> ↑↑₽	۲	ተተኈ	۲.	1	1	۲	†	1	
raffic Volume (vph)	663	446	1537	129	201	245	67	289	122	
uture Volume (vph)	663	446	1537	129	201	245	67	289	122	
ane Group Flow (vph)	891	469	1703	136	212	258	71	304	128	
urn Type	NA	pm+pt	NA	Prot	NA	Perm	Prot	NA	Perm	
Protected Phases	2	1	6	3	8		7	4		
Permitted Phases		6				8			4	
Detector Phase	2	1	6	3	8	8	7	4	4	
Switch Phase										
/linimum Initial (s)	10.0	5.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	
/inimum Split (s)	29.0	10.4	29.0	11.3	37.7	37.7	11.3	37.7	37.7	
otal Split (s)	30.3	36.0	66.3	16.0	38.9	38.9	14.8	37.7	37.7	
otal Split (%)	25.3%	30.0%	55.3%	13.3%	32.4%	32.4%	12.3%	31.4%	31.4%	
/ellow Time (s)	3.7	3.7	3.7	3.3	3.3	3.3	3.3	3.3	3.3	
All-Red Time (s)	2.3	1.7	2.3	3.0	3.4	3.4	3.0	3.4	3.4	
ost Time Adjust (s)	-2.0	-1.4	-2.0	-2.3	-2.7	-2.7	-2.3	-2.7	-2.7	
otal Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
.ead/Lag	Lag	Lead		Lead	Lag	Lag	Lead	Lag	Lag	
ead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	C-Max	None	C-Max	None	None	None	None	None	None	
Act Effct Green (s)	32.4	68.1	68.1	12.0	32.1	32.1	10.4	27.9	27.9	
Actuated g/C Ratio	0.27	0.57	0.57	0.10	0.27	0.27	0.09	0.23	0.23	
/c Ratio	0.69	0.91	0.62	0.80	0.44	0.45	0.49	0.73	0.29	
Control Delay	30.6	52.1	19.2	85.7	40.0	6.5	63.8	52.9	6.8	
Queue Delay	0.3	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	
otal Delay	30.9	52.1	19.8	85.7	40.0	6.5	63.8	52.9	6.8	
.OS	С	D	В	F	D	А	E	D	А	
Approach Delay	30.9		26.7		36.0			42.7		
Approach LOS	С		С		D			D		
Queue Length 50th (m)	42.5	84.3	93.8	31.9	42.9	0.0	16.1	66.3	0.0	
Queue Length 95th (m)	54.6	#153.6	121.2	#64.8	62.5	19.1	31.2	91.7	13.0	
nternal Link Dist (m)	81.2		139.3		161.9			100.7		
urn Bay Length (m)		90.0		40.0			28.0		35.0	
Base Capacity (vph)	1297	538	2736	169	522	610	152	501	507	
Starvation Cap Reductn	72	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	541	0	0	0	0	0	14	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.73	0.87	0.78	0.80	0.41	0.42	0.47	0.61	0.26	
ntersection Summary										
cycle Length: 120 ctuated Cycle Length: 120 Miset: 15 (13%), Referenced to p latural Cycle: 110 control Type: Actuated-Coordina		nd 6:WBTL, S	Start of Gree	en						
/laximum v/c Ratio: 0.91 ntersection Signal Delay: 30.9 ntersection Capacity Utilization 8 Malysis Period (min) 15	6.8%				ersection LC U Level of S					
 95th percentile volume excee Queue shown is maximum after 	er two cycles.	eue may be	longer.							
Splits and Phases: 2: Merivale	& Carling					•		1		
■ (01)		→ Ø	2 (K)			1 ø3		🕈 Ø4		
		30.3 e				16 s		37.7 s		
Ø6 (R)		30.3 s				16 s Ø7		37.7 s		

Projected 2019 PM - Modified 3: Carling & Westgate SC

	\$	≯	-	4	-	1	Ť	5	ŧ	-	
Lane Group	EBU	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR	
Lane Configurations		Ă	ተተኈ	۲	ተተኈ		4		ب ا	1	
Traffic Volume (vph)	58	179	753	1	1679	10	3	111	4	143	
Future Volume (vph)	58	179	753	1	1679	10	3	111	4	143	
Lane Group Flow (vph)	0	249	801	1	1904	0	18	0	121	151	
Turn Type	pm+pt	pm+pt	NA	Perm	NA	Perm	NA	Perm	NA	Perm	
Protected Phases	5	5	2		6		8		4		
Permitted Phases	2	2		6		8	<u>,</u>	4		4	
Detector Phase	5	5	2	6	6	8	8	4	4	4	
Switch Phase	ГО	ГО	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	
Minimum Initial (s)	5.0 10.6	5.0 10.6	10.0 23.6	10.0 23.6	10.0 23.6	10.0 37.0	10.0 37.0	10.0 37.0	10.0 37.0	10.0 37.0	
Minimum Split (s)				23.0 59.0	23.0 59.0	37.0				37.0	
Total Split (s) Total Split (%)	24.0 20.0%	24.0 20.0%	83.0 69.2%	59.0 49.2%	59.0 49.2%	37.0	37.0 30.8%	37.0 30.8%	37.0 30.8%	37.0	
Yellow Time (s)	3.7	20.0%	3.7	49.2%	49.2%	30.8%	30.8%	30.8%	30.8%	30.8%	
All-Red Time (s)	1.9	1.9	1.9	1.9	1.9	4.0	4.0	4.0	4.0	4.0	
Lost Time Adjust (s)	1.7	-1.6	-1.6	-1.6	-1.6	4.0	-3.0	4.0	-3.0	-3.0	
Total Lost Time (s)		4.0	4.0	4.0	4.0		4.0		4.0	4.0	
Lead/Lag	Lead	Lead	4.0	Lag	Lag		4.0		4.0	4.0	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes						
Recall Mode	None	None	C-Max	C-Max	C-Max	None	None	None	None	None	
Act Effct Green (s)	None	91.0	91.0	69.5	69.5	None	21.0	None	21.0	21.0	
Actuated g/C Ratio		0.76	0.76	0.58	0.58		0.18		0.18	0.18	
v/c Ratio		0.80	0.22	0.00	0.68		0.07		0.54	0.39	
Control Delay		57.2	2.9	7.0	11.9		31.5		52.4	8.6	
Queue Delay		0.0	0.0	0.0	0.3		0.0		0.0	0.0	
Total Delay		57.2	2.9	7.0	12.3		31.5		52.4	8.6	
LOS		E	А	А	В		С		D	А	
Approach Delay			15.7		12.2		31.5		28.1		
Approach LOS			В		В		С		С		
Queue Length 50th (m)		39.5	10.0	0.0	123.0		2.8		26.6	0.0	
Queue Length 95th (m)		m#75.6	m17.2	m0.1	179.0		8.1		40.0	15.4	
Internal Link Dist (m)			162.3		81.2		10.8		75.6		
Turn Bay Length (m)		70.0		36.0							
Base Capacity (vph)		351	3691	348	2797		399		353	526	
Starvation Cap Reductn		0	0	0	335		0		0	0	
Spillback Cap Reductn		0	0	0	0		0		0	0	
Storage Cap Reductn		0	0 0.22	0	0 0.77		0		0	0 0.29	
Reduced v/c Ratio		0.71	0.22	0.00	0.77		0.05		0.34	0.29	
Intersection Summary											
Cycle Length: 120											
Actuated Cycle Length: 120											
Offset: 3 (3%), Referenced to phase	e 2:EBTL and	16:WBTL, S	tart of Gree	n							
Natural Cycle: 90 Control Type: Actuated-Coordinated	4										
Maximum v/c Ratio: 0.80	1										
Intersection Signal Delay: 14.8				Int	tersection L(ראי β					
Intersection Capacity Utilization 82.2	2%				U Level of S						
Analysis Period (min) 15	L / U			10							
# 95th percentile volume exceeds	capacity. du	eue may be	longer								
Queue shown is maximum after		- 10 may 50									
m Volume for 95th percentile que		l by upstrea	m signal.								
Splits and Phases: 3: Carling & W	Vestgate SC										
₫ Ø2 (R)								\$ ø4			
83 s								37 s			
≯ _{ø5}	🕈 Ø6 (R)							1ø8			
24 c	50.0							27 c			

24

59 s

7 s

Projected 2019 PM - Modified 4: Kirkwood & Carling WB

	4	+	1	†	ţ	~	
Lane Group	WBL	WBT	NBL	NBT	SBT	SBR	
Lane Configurations	<u> </u>	11	<u>NDL</u>	↑	<u></u>	<u> </u>	
Traffic Volume (vph)	205	2308	227	545	481	410	
Future Volume (vph)	205	2308	227	545	481	410	
Lane Group Flow (vph)	216	2761	239	574	506	432	
Turn Type	Prot	NA	pm+pt	NA	NA	Perm	
Protected Phases	1	6	3	8	4		
Permitted Phases			8			4	
Detector Phase	1	6	3	8	4	4	
Switch Phase							
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0	
Minimum Split (s)	16.3	35.3	11.0	29.0	29.0	29.0	
Total Split (s)	73.0	73.0	14.0	47.0	33.0	33.0	
Total Split (%)	60.8%	60.8%	11.7%	39.2%	27.5%	27.5%	
Yellow Time (s)	3.7	3.7	3.3	3.3	3.3	3.3	
All-Red Time (s)	2.6	2.6	2.7	2.7	2.7	2.7	
Lost Time Adjust (s)	-2.3	-2.3	-2.0	-2.0	-2.0	-2.0	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	
Lead/Lag			Lead		Lag	Lag	
Lead-Lag Optimize?		0.11	Yes	c .	Yes	Yes	
Recall Mode	None	C-Max	None	Ped	Ped	Ped	
Act Effct Green (s)	69.0	69.0	43.0	43.0	29.0	29.0	
Actuated g/C Ratio	0.58	0.58	0.36	0.36	0.24	0.24	
v/c Ratio	0.11 5.9	1.00 36.3	0.92 68.1	0.90 54.2	0.62 44.4	1.00 81.0	
Control Delay Queue Delay	5.9 0.0	36.3 0.0	68.1 0.0	54.2 15.8	44.4 0.0	81.0 0.0	
Total Delay	0.0 5.9	36.3	68.1	70.0	44.4	81.0	
LOS	5.9 A	30.3 D	00.1 E	70.0 E	44.4 D	61.0 F	
Approach Delay	A	34.1	E	69.4	61.2	Г	
Approach LOS		54.1 C		09.4 E	61.2 E		
Queue Length 50th (m)	6.5	248.4	52.0	140.7	56.2	~85.9	
Queue Length 95th (m)	m6.7	#276.6	#99.2	#199.0	74.2	#152.0	
Internal Link Dist (m)	1110.7	113.3	" 7 7. <u>~</u>	144.7	73.8	#102.0	
Turn Bay Length (m)	40.0	11010			1010	22.0	
Base Capacity (vph)	1890	2765	260	639	819	431	
Starvation Cap Reductn	0	0	0	69	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.11	1.00	0.92	1.01	0.62	1.00	
Intersection Summary							
Intersection Summary							
Cycle Length: 120 Actuated Cycle Length: 120							
Offset: 39 (33%), Referenced to ph	DOCO 6-W/DT C	tart of Croo	n				
Natural Cycle: 100	lase o:wb1, S	tart of Gree	11				
Control Type: Actuated-Coordinate	h						
Maximum v/c Ratio: 1.00	eu						
Intersection Signal Delay: 45.5				Int	ersection L		
Intersection Capacity Utilization 10	14.5%				U Level of S		
Analysis Period (min) 15	14.370			10		Del VICE O	
 Volume exceeds capacity, que 	ue is theoretic:	ally infinite					
Queue shown is maximum after		ing minine.					
# 95th percentile volume exceeds		eue may he	longer				
Queue shown is maximum after		ao may bo	iongon.				
m Volume for 95th percentile que		by upstream	n signal.				
Splits and Phases: 4: Kirkwood	& Carling WB						
							1
							Ø 3
73 s							14 s

√ Ø1	Ø 3	🖞 Ø4
73 s	14 s	33 s
₩ Ø6 (R)	1 ø8	
73 s	47 s	



Projected 2024 AM 1: Kirkwood & Carling EB

1: KIRKWOOD & Carling EB	٦	-	\mathbf{r}	t	~	1	ţ
Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Configurations	<u></u>	411				JDL	<u> </u>
Traffic Volume (vph)	187	4 TT 1959	187	TT 369	339	351	T 439
Future Volume (vph)	187	1959	187	369	339	351	439
Lane Group Flow (vph)	177	2082	197	388	357	369	462
Turn Type	Perm	NA	Perm	NA	Perm	pm+pt	NA
Protected Phases		2		8		7	4
Permitted Phases	2		2		8	4	
Detector Phase	2	2	2	8	8	7	4
Switch Phase							
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	5.0	10.0
Minimum Split (s)	29.2	29.2	29.2	26.1	26.1	10.1	26.1
Total Split (s)	58.0	58.0	58.0	38.0	38.0	24.0	62.0
Total Split (%)	48.3%	48.3%	48.3%	31.7%	31.7%	20.0%	51.7%
Yellow Time (s)	3.7	3.7	3.7	3.3	3.3	3.3	3.3
All-Red Time (s)	2.5	2.5	2.5	2.8	2.8	1.8	2.8
Lost Time Adjust (s)	-2.2	-2.2	-2.2	-2.1	-2.1	-1.1	-2.1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag				Lag	Lag	Lead	
Lead-Lag Optimize?				Yes	Yes	Yes	
Recall Mode	C-Max	C-Max	C-Max	Min	Min	Min	Min
Act Effct Green (s)	55.7	55.7	55.7	32.3	32.3	56.3	56.3
Actuated g/C Ratio	0.46	0.46	0.46	0.27	0.27	0.47	0.47
v/c Ratio	0.26	0.97	0.26	0.43	0.88	0.78	0.55
Control Delay	21.5	46.3	7.0	37.5	64.6	32.9	24.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.5
Total Delay	21.5	46.3	7.0	37.5	64.6	32.9	24.7
LOS	С	D	А	D	E	С	С
Approach Delay		41.4		50.5			28.4
Approach LOS		D		D			С
Queue Length 50th (m)	29.6	~188.4	6.7	38.9	78.9	72.2	92.4
Queue Length 95th (m)	48.2	#229.4	20.7	53.2	#127.0	#100.5	122.8
Internal Link Dist (m)		161.6		158.6			152.2
Turn Bay Length (m)	40.0	_			90.0		
Base Capacity (vph)	676	2138	744	960	429	474	862
Starvation Cap Reductn	0	0	0	0	0	0	120
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.97	0.26	0.40	0.83	0.78	0.62
Intersection Summary							
Cycle Length: 120							
Actuated Cycle Length: 120							
Offset: 15 (13%), Referenced to pha	ase 2·EBTL (Start of Gree	≏n				
Natural Cycle: 90							
Control Type: Actuated-Coordinated	h						
Maximum v/c Ratio: 0.97	u						
Intersection Signal Delay: 40.4				In	tersection L	0S· D	
Intersection Capacity Utilization 85.	7%				U Level of S		
Analysis Period (min) 15	170			10			
 Volume exceeds capacity, queu 	ie is theoretic	ally infinite					
Queue shown is maximum after		any minito.					
# 95th percentile volume exceeds		eue may he	longer				
Queue shown is maximum after		cue may be	longer.				
Splits and Phases: 1: Kirkwood 8	Carling EB						
Ø2 (R)					Ø4		
58 s					62 s		
					Ø7		
1					24.0		

24 s

8 s

Projected 2024 AM 2: Merivale & Carling

	-	4	+	•	t	1	×	ţ	1	
Lane Group	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	4 † ₽	<u> </u>	ተተቡ	5	1	1	<u> </u>	↑	1	
Fraffic Volume (vph)	1007	188	591	167	243	352	43	278	238	
uture Volume (vph)	1007	188	591	167	243	352	43	278	238	
ane Group Flow (vph)	1183	198	666	176	256	371	45	293	251	
urn Type	NA	pm+pt	NA	Prot	NA	Perm	Prot	NA	Perm	
otected Phases	2	1	6	3	8	1 01111	7	4	1 01111	
ermitted Phases		6	-	-	-	8			4	
etector Phase	2	1	6	3	8	8	7	4	4	
witch Phase	-	•	Ū	ž	, v		•	•		
inimum Initial (s)	10.0	5.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	
linimum Split (s)	29.0	10.4	29.0	11.3	37.7	37.7	11.3	37.7	37.7	
otal Split (s)	49.0	12.0	61.0	21.0	38.0	38.0	21.0	38.0	38.0	
otal Split (%)	40.8%	10.0%	50.8%	17.5%	31.7%	31.7%	17.5%	31.7%	31.7%	
ellow Time (s)	3.7	3.7	3.7	3.3	3.3	3.3	3.3	3.3	3.3	
I-Red Time (s)	2.3	1.7	2.3	3.0	3.4	3.4	3.0	3.4	3.4	
ost Time Adjust (s)	-2.0	-1.4	-2.0	-2.3	-2.7	-2.7	-2.3	-2.7	-2.7	
otal Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
ead/Lag	Lag	Lead	1.0	Lead	Lag	Lag	Lead	Lag	Lag	
ead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	
ecall Mode	C-Max	None	C-Max	None	None	None	None	None	None	
ct Effct Green (s)	46.5	64.0	64.0	16.4	35.5	35.5	10.9	27.6	27.6	
ctuated g/C Ratio	0.39	0.53	0.53	0.14	0.30	0.30	0.09	0.23	0.23	
c Ratio	0.64	0.33	0.26	0.76	0.49	0.58	0.29	0.71	0.53	
ontrol Delay	26.6	36.1	16.0	71.1	38.5	12.2	55.0	52.1	15.7	
ieue Delay	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
tal Delay	27.2	36.1	16.0	71.1	38.5	12.2	55.0	52.1	15.7	
)S	C	D	B	E	D	B	D	D	B	
proach Delay	27.2	D	20.6		33.5	D	D	36.8	D	
proach LOS	C		C		C			D		
ieue Length 50th (m)	63.8	24.3	30.0	40.2	50.2	14.2	10.1	63.4	13.5	
Jeue Length 95th (m)	78.9	#74.6	42.1	#71.5	73.5	43.5	21.2	87.7	36.2	
ernal Link Dist (m)	89.4		139.3		159.9	1010	2.12	100.7	0012	
rn Bay Length (m)	07.1	90.0	107.0	40.0	107.7		28.0	100.7	35.0	
se Capacity (vph)	1859	277	2563	240	533	640	240	505	537	
arvation Cap Reductn	322	0	2303	240	0	040	240	0	0	
pillback Cap Reductn	0	0	0	0	0	0	0	0	0	
orage Cap Reductn	0	0	0	0	0	0	0	0	0	
educed v/c Ratio	0.77	0.71	0.26	0.73	0.48	0.58	0.19	0.58	0.47	
				5.7.0		1.00	,	2.00		
ersection Summary cle Length: 120										
tuated Cycle Length: 120										
fset: 54 (45%), Referenced to p	nhase 2.FRT and	16·WRTI	Start of Gree	en						
atural Cycle: 90		JU. WDIL,								
ontrol Type: Actuated-Coordina	hat									
iximum v/c Ratio: 0.76	iteu									
ersection Signal Delay: 28.7				Int	tersection LC	1S. C				
ersection Capacity Utilization 7	79 5%				U Level of S					
alysis Period (min) 15	7.370			iC	O LEVELUI 3					
95th percentile volume excee	de capacity que	uo may bo	longor							
Queue shown is maximum after		ue may be	ionger.							
	2									
ts and Phases: 2: Merivale	& Carling				•			*		
√Ø1 →Ø2 (R)					٩.	03		¥ Ø4		_
2.s <mark>4</mark> 9.s					21 s			38 s		
🔽 Ø6 (R) 🏮						07		¶ø8		
1 s					21 s			38 s		

Projected 2024 AM 3: Carling & Westgate SC

	≤	≯	-	4	←	•	Ť	1	Ļ	-	
Lane Group	EBU	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR	
Lane Configurations		ă	ተተኈ	٦	<u>ተተ</u> ኑ		4		र्स	1	
Traffic Volume (vph)	128	273	995	2	780	16	2	67	0	76	
Future Volume (vph)	128	273	995	2	780	16	2	67	0	76	
Lane Group Flow (vph)	0	422	1061	2	910	0	24	0	71	80	
Turn Type	Perm	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	
Protected Phases			2		6		8		4		
Permitted Phases	2	2		6		8		4		4	
Detector Phase	2	2	2	6	6	8	8	4	4	4	
Switch Phase											
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	23.6	23.6	23.6	23.6	23.6	37.0	37.0	37.0	37.0	37.0	
Total Split (s)	83.0	83.0	83.0	83.0	83.0	37.0	37.0	37.0	37.0	37.0	
Total Split (%)	69.2%	69.2%	69.2%	69.2%	69.2%	30.8%	30.8%	30.8%	30.8%	30.8%	
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	1.9	1.9	1.9	1.9	1.9	4.0	4.0	4.0	4.0	4.0	
Lost Time Adjust (s)		-1.6	-1.6	-1.6	-1.6		-3.0		-3.0	-3.0	
Total Lost Time (s)		4.0	4.0	4.0	4.0		4.0		4.0	4.0	
Lead/Lag											
Lead-Lag Optimize?											
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None	None	
Act Effct Green (s)		93.8	93.8	93.8	93.8		18.2		18.2	18.2	
Actuated g/C Ratio		0.78	0.78	0.78	0.78		0.15		0.15	0.15	
v/c Ratio		1.04	0.28	0.01	0.24		0.11		0.36	0.27	
Control Delay		60.3	2.6	5.5	4.2		34.6		48.6	10.4	
Queue Delay		0.0	0.0	0.0	0.1		0.0		0.0	0.0	
Total Delay		60.3	2.6	5.5	4.3		34.6		48.6	10.4	
LOS		E	А	А	А		С		D	В	
Approach Delay			19.0		4.3		34.6		28.4		
Approach LOS			В		А		С		С		
Queue Length 50th (m)		~51.9	11.1	0.1	17.2		4.0		15.7	0.0	
Queue Length 95th (m)		m#144.1	m19.8	m0.4	31.4		10.0		25.1	11.6	
Internal Link Dist (m)			168.6		89.4		10.8		75.6		
Turn Bay Length (m)		70.0		36.0							
Base Capacity (vph)		405	3798	346	3728		382		357	464	
Starvation Cap Reductn		0	0	0	1470		0		0	0	
Spillback Cap Reductn		0	59	0	0		0		0	0	
Storage Cap Reductn		0	0	0	0		0		0	0	
Reduced v/c Ratio		1.04	0.28	0.01	0.40		0.06		0.20	0.17	
Intersection Summary											
Cycle Length: 120	se 2:EBTL a	and 6:WBTL,	, Start of Gr	een							
Cycle Length: 120 Actuated Cycle Length: 120 Offset: 26 (22%), Referenced to phas Natural Cycle: 120 Control Type: Actuated-Coordinated	se 2:EBTL a	and 6:WBTL,	, Start of Gr	een							
Cycle Length: 120 Actuated Cycle Length: 120 Offset: 26 (22%), Referenced to phas Natural Cycle: 120 Control Type: Actuated-Coordinated Maximum v/c Ratio: 1.04 Intersection Signal Delay: 14.5		and 6:WBTL,	, Start of Gr	Int	ersection LC						
Cycle Length: 120 Actuated Cycle Length: 120 Offset: 26 (22%), Referenced to phas Natural Cycle: 120 Control Type: Actuated-Coordinated Maximum v/c Ratio: 1.04 Intersection Signal Delay: 14.5 Intersection Capacity Utilization 83.59	%		. Start of Gr	Int	ersection LC U Level of S						
Cycle Length: 120 Actuated Cycle Length: 120 Offset: 26 (22%), Referenced to phas Natural Cycle: 120 Control Type: Actuated-Coordinated Maximum v/c Ratio: 1.04 Intersection Signal Delay: 14.5 Intersection Capacity Utilization 83.59 Analysis Period (min) 15 ~ Volume exceeds capacity, queue Queue shown is maximum after tw	% is theoreti	cally infinite.		Int							
Cycle Length: 120 Actuated Cycle Length: 120 Offset: 26 (22%), Referenced to phas Natural Cycle: 120 Control Type: Actuated-Coordinated Maximum v/c Ratio: 1.04 Intersection Signal Delay: 14.5 Intersection Capacity Utilization 83.59 Analysis Period (min) 15 - Volume exceeds capacity, queue Queue shown is maximum after tw # 95th percentile volume exceeds c Queue shown is maximum after tw	% is theoreti vo cycles. apacity, qu vo cycles.	cally infinite. Jeue may be	longer.	Int							
Cycle Length: 120 Actuated Cycle Length: 120 Offset: 26 (22%), Referenced to phas Natural Cycle: 120 Control Type: Actuated-Coordinated Maximum v/c Ratio: 1.04 Intersection Signal Delay: 14.5 Intersection Capacity Utilization 83.59 Analysis Period (min) 15 - Volume exceeds capacity, queue Queue shown is maximum after tw # 95th percentile volume exceeds c Queue shown is maximum after tw m Volume for 95th percentile queue	% is theoretic vo cycles. apacity, qu vo cycles. e is metere	cally infinite. Jeue may be d by upstread	longer.	Int							
Cycle Length: 120 Actuated Cycle Length: 120 Offset: 26 (22%), Referenced to phas Natural Cycle: 120 Control Type: Actuated-Coordinated Maximum v/c Ratio: 1.04 Intersection Signal Delay: 14.5 Intersection Capacity Utilization 83.59 Analysis Period (min) 15 - Volume exceeds capacity, queue Queue shown is maximum after tw # 95th percentile volume exceeds c	% is theoretic vo cycles. apacity, qu vo cycles. e is metere	cally infinite. Jeue may be d by upstread	longer.	Int				↓ ø4			

st ø2 (R)	∲ ≥ø4
83 s	37 s
₩ Ø6 (R)	1 Ø8
83 s	37 s

Projected 2024 AM 4: Kirkwood & Carling WB

	4	-	•	1	Ť	4
Lane Group	WBL	WBT	NBL	NBT	SBT	SBR
Lane Configurations	ሻሻ	ተተቡ	٢	1	††	1
Traffic Volume (vph)	351	1280	280	307	352	360
Future Volume (vph)	351	1280	280	307	352	360
Lane Group Flow (vph)	369	1611	295	323	371	379
Turn Type	Prot	NA	pm+pt	NA	NA	Perm
Protected Phases	1	6	3	8	4	T CHI
Permitted Phases		0	8	U	7	4
Detector Phase	1	6	3	8	4	4
Switch Phase	I	0	3	0	4	4
	10.0	10.0	ГО	10.0	10.0	10.0
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	16.3	35.3	11.0	29.0	29.0	29.0
Total Split (s)	58.0	58.0	24.0	62.0	38.0	38.0
Total Split (%)	48.3%	48.3%	20.0%	51.7%	31.7%	31.7%
Yellow Time (s)	3.7	3.7	3.3	3.3	3.3	3.3
All-Red Time (s)	2.6	2.6	2.7	2.7	2.7	2.7
Lost Time Adjust (s)	-2.3	-2.3	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	0.7	-1.U	Lead	J.U	Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	C-Max		Dod		Ped
	None		None	Ped	Ped	
Act Effct Green (s)	57.6	57.6	54.4	54.4	31.3	31.3
Actuated g/C Ratio	0.48	0.48	0.45	0.45	0.26	0.26
v/c Ratio	0.23	0.71	0.64	0.40	0.42	0.86
Control Delay	16.8	23.0	20.2	15.3	37.9	51.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.8	23.0	20.2	15.3	37.9	51.6
LOS	В	С	С	В	D	D
Approach Delay		21.8		17.7	44.8	
Approach LOS		С		В	D	
Queue Length 50th (m)	25.0	92.5	49.1	53.9	37.0	65.7
Queue Length 95th (m)	m25.6	m105.6	m70.2	m75.9	51.0	#113.6
Internal Link Dist (m)		110.3		152.2	73.8	
Turn Bay Length (m)	40.0	110.5		132.2	, 5.0	22.0
	1577	2266	468	862	960	472
Base Capacity (vph)						
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.71	0.63	0.37	0.39	0.80
Intersection Summary						
Cycle Length: 120						
Actuated Cycle Length: 120						
Offset: 66 (55%), Referenced to ph	nase 6:WBT, S	start of Gree	n			
Natural Cycle: 80						
Control Type: Actuated-Coordinate	ed					
Maximum v/c Ratio: 0.86						
Intersection Signal Delay: 26.2				In	tersection L	DS: C
Intersection Capacity Utilization 85	.7%			IC	U Level of S	Service E
Analysis Period (min) 15						
# 95th percentile volume exceed	s capacity que	eue may be	longer			
Queue shown is maximum after		sao may be	.ongoi.			
m Volume for 95th percentile que		hy unstrop	n signal			
in volume for som percentile que		ny upsilea	nı siyıldı.			
Splits and Phases: 4: Kirkwood	& Carling WB					
					4 m	
√ Ø1					Ø 3	

√ Ø1	^ Ø3 ₽ Ø4	
58 s	24 s 38 s	
, ←	1 Ø8	
58 s	62 s	

Projected 2024 AM 5: Merivale & Thames

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4			\$			4î b			đÞ.	
Traffic Volume (veh/h)	11	0	9	2	0	4	24	747	1	1	559	23
Future Volume (Veh/h)	11	0	9	2	0	4	24	747	1	1	559	23
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	12	0	9	2	0	4	25	786	1	1	588	24
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)											184	
pX, platoon unblocked												
vC, conflicting volume	1049	1439	306	1142	1450	394	612			787		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1049	1439	306	1142	1450	394	612			787		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	93	100	99	99	100	99	97			100		
cM capacity (veh/h)	177	128	690	150	126	606	963			828		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	21	6	418	394	295	318						
Volume Left	12	2	25	0	1	0						
Volume Right	9	4	0	1	0	24						
cSH	260	301	963	1700	828	1700						
Volume to Capacity	0.08	0.02	0.03	0.23	0.00	0.19						
Queue Length 95th (m)	2.0	0.5	0.6	0.0	0.0	0.0						
Control Delay (s)	20.1	17.2	0.8	0.0	0.0	0.0						
Lane LOS	20.1 C	C	A	0.0	A	0.0						
Approach Delay (s)	20.1	17.2	0.4		0.0							
Approach LOS	20.1 C	C	т.0		0.0							
Intersection Summary												
Average Delay			0.6									
Intersection Capacity Utilization			50.2%	ICI	J Level of S	ervice			А			
Analysis Period (min)			15	100		011100						

Projected 2024 PM 1: Kirkwood & Carling EB

Lane GroupEBLEBTEBRNBTNBRSBLSBTLane ConfigurationsImage: Configuration in the configuration
Lane Configurations Image: Configuration in the image: Configuration in th
Traffic Volume (vph) 419 1344 330 328 258 320 372 Future Volume (vph) 419 1344 330 328 258 320 372
Future Volume (vph) 419 1344 330 328 258 320 372
Lane Group Flow (vph) 392 1464 347 345 272 337 392
Turn TypePermNAPermpm+ptNAProtected Phases2874
Protected Phases 2 2 8 7 4 Permitted Phases 2 2 8 4
Detector Phase 2 2 2 6 4
Switch Phase
Minimum Initial (s) 10.0 10.0 10.0 10.0 10.0 5.0 10.0
Minimum Split (s) 29.2 29.2 29.2 26.1 26.1 10.1 26.1
Total Split (s) 61.0 61.0 61.0 29.0 29.0 30.0 59.0
Total Split (%) 50.8% 50.8% 50.8% 24.2% 24.2% 25.0% 49.2%
Yellow Time (s) 3.7 3.7 3.7 3.3 3.3 3.3 3.3
All-Red Time (s) 2.5 2.5 2.5 2.8 2.8 1.8 2.8
Lost Time Adjust (s) -2.2 -2.2 -2.2 -2.1 -2.1 -1.1 -2.1
Total Lost Time (s) 4.0 4.0 4.0 4.0 4.0 4.0 4.0
Lead/Lag Lag Lag Lead
Lead-Lag Optimize? Yes Yes Yes Recall Mode C-Max C-Max Min Min Min
Recall Mode C-Max C-Max Min Min Min Act Effct Green (s) 58.8 58.8 58.8 24.4 24.4 53.2 53.2
Actuated g/C Ratio 0.49 0.49 0.49 0.20 0.44 0.44
v/c Ratio 0.55 0.65 0.41 0.50 0.88 0.69 0.50
Control Delay 25.6 25.0 5.9 45.1 75.6 17.9 13.5
Queue Delay 0.3 0.1 0.0 0.0 0.0 0.0
Total Delay 25.9 25.1 5.9 45.1 75.6 17.9 13.5
LOS C C A D E B B
Approach Delay 22.2 58.6 15.5
Approach LOS C E B
Queue Length 50th (m) 75.1 100.2 8.8 37.9 62.3 49.1 74.8
Queue Length 95th (m) 110.9 117.5 27.9 52.7 #108.3 92.1 106.3 Letength 15th (m) 111.6 111.6 111.6 111.7 111.7
Internal Link Dist (m) 161.6 158.6 144.7
Turn Bay Length (m) 40.0 90.0 Base Capacity (vph) 713 2252 843 707 316 501 817
Base Capacity (vph) 713 2252 843 707 316 501 817 Starvation Cap Reductn 0 0 0 0 0 0 0 0
Stativation Cap Reductin 0
Spinialize Cap Reductin Still 107 0 </td
Reduced v/c Ratio 0.59 0.68 0.41 0.49 0.86 0.67 0.48
Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 81 (68%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle: 70 Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.88
Intersection Signal Delay: 27.2 Intersection LOS: C
Intersection Signal Delay: 27.2 Intersection LOS: C Intersection Capacity Utilization 110.1% ICU Level of Service H
Analysis Period (min) 15
 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
Splits and Phases: 1: Kirkwood & Carling EB
Ø2 (R) ↓Ø4
61 s 59 s
N
▶Ø7

Projected 2024 PM 2: Merivale & Carling

2: Merivale & Carling	→	4	+	1	Ť	1	1	Ļ	1	
Lane Group	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	*††	<u> </u>	*††•	ň	<u> </u>	1	1	<u>, 101</u>	7	
Fraffic Volume (vph)	696	462	1550	135	207	245	77	294	122	
uture Volume (vph)	696	462	1550	135	207	245	77	294	122	
ane Group Flow (vph)	938	402	1731	142	207	243	81	309	122	
			NA	Prot	NA					
n Type otected Phases	NA 2	pm+pt 1	NA 6	P101 3	NA 8	Perm	Prot 7	NA 4	Perm	
	Z		0	3	ð	0	1	4	4	
ermitted Phases	2	6	1	n	0	8	7	4	4	
etector Phase	2	1	6	3	8	8	7	4	4	
vitch Phase	10.0	5.0	40.0	5.0	10.0	10.0	5.0	10.0	10.0	
nimum Initial (s)	10.0	5.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	
inimum Split (s)	29.0	10.4	29.0	11.3	37.7	37.7	11.3	37.7	37.7	
otal Split (s)	42.0	20.0	62.0	20.0	38.0	38.0	20.0	38.0	38.0	
tal Split (%)	35.0%	16.7%	51.7%	16.7%	31.7%	31.7%	16.7%	31.7%	31.7%	
llow Time (s)	3.7	3.7	3.7	3.3	3.3	3.3	3.3	3.3	3.3	
-Red Time (s)	2.3	1.7	2.3	3.0	3.4	3.4	3.0	3.4	3.4	
st Time Adjust (s)	-2.0	-1.4	-2.0	-2.3	-2.7	-2.7	-2.3	-2.7	-2.7	
otal Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
ad/Lag	Lag	Lead		Lead	Lag	Lag	Lead	Lag	Lag	
ead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	
ecall Mode	C-Max	None	C-Max	None	None	None	None	None	None	
ct Effct Green (s)	38.0	64.8	64.8	15.0	32.8	32.8	13.0	28.2	28.2	
tuated g/C Ratio	0.32	0.54	0.54	0.12	0.27	0.27	0.11	0.24	0.24	
Ratio	0.62	1.18	0.67	0.67	0.45	0.44	0.44	0.74	0.29	
ntrol Delay	27.3	130.7	22.3	66.1	39.7	6.5	57.1	52.9	6.7	
eue Delay	0.9	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	
al Delay	28.2	130.7	22.8	66.1	39.7	6.5	57.1	52.9	6.7	
S	С	F	С	E	D	А	E	D	А	
proach Delay	28.2		46.4		31.9			42.1		
proach LOS	С		D		С			D		
ieue Length 50th (m)	38.2	~119.2	105.4	32.1	43.4	0.0	18.1	67.4	0.0	
eue Length 95th (m)	48.6	#203.4	134.6	53.4	64.9	19.4	33.1	92.8	13.0	
ernal Link Dist (m)	81.2		139.3		161.9			100.7		
rn Bay Length (m)		90.0		40.0			28.0		35.0	
se Capacity (vph)	1519	413	2597	226	512	603	226	505	510	
arvation Cap Reductn	301	0	0	0	0	0	0	0	0	
illback Cap Reductn	0	0	366	0	0	0	0	0	9	
prage Cap Reductn	0	0	0	0	0	0	0	0	0	
duced v/c Ratio	0.77	1.18	0.78	0.63	0.43	0.43	0.36	0.61	0.26	
ersection Summary										
cle Length: 120										
5										
tuated Cycle Length: 120 fset: 15 (13%), Referenced to p	hace 2 EPT on		Start of Cra							
itural Cycle: 110	JIIdse 2.EDT di	U O. WDTL,	Start of Gree	en						
ntrol Type: Actuated-Coordina	tod									
	leu									
ximum v/c Ratio: 1.18				14						
ersection Signal Delay: 39.8	0.20/				ersection L					
ersection Capacity Utilization 8	00.3%			IC	U Level of S	bei vice E				
alysis Period (min) 15		ally infinite								
Volume exceeds capacity, qu		any infinite.								
Queue shown is maximum after			Leave a							
95th percentile volume excee		eue may be	ionger.							
Queue shown is maximum after	er two cycles.									
lits and Phases: 2: Merivale	& Carling									
<i>·</i>					•	~~		*		
	₱Ø2 (R)					Ø3		¥ Ø4		
)s <mark>4</mark> 2	S				20 s			38 s		

√ Ø1	→Ø2 (R)	Ø3	↓ Ø4
20 s	42 s	20 s	38 s
₩ Ø6 (R)		₩ø7	1ø8
62 s		20 s	38 s

Projected 2024 PM 3: Carling & Westgate SC

1	≯	+	4	+	×	Ť	1	ţ	-	
EBU	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR	
	24	ተተጉ	7	<u>ተተኑ</u>		\$		ŧ	1	
74	230	783	1	1679	10	3	127	4	138	
			Perm		Perm		Perm		Perm	
		2		6		8		4		
		0		1		0		4		
5	5	2	6	6	8	8	4	4	4	
ГО	ГО	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	
1.7					4.0		4.0			
Lead		0.0				7.0		7.0	7.0	
Yes	Yes		Yes	Yes						
None		C-Max			None	None	None	None	None	
	88.1	88.1	58.5	58.5		19.3		19.3	19.3	
	0.73	0.73	0.49	0.49		0.16		0.16	0.16	
	0.80	0.23	0.00	0.82		0.08		0.69	0.62	
	57.7		8.0			33.0		63.7		
						33.0				
	E		А						E	
	50.4									
	m#120.0		m0.0						48.0	
	70.0	102.3	26.0	ŏ1.Z		10.8		/ 0.0		
		2570		2227		212		210	264	
	-									
:EBTL an	d 6:WBTL, S	tart of Gree	n							
%			IC	U Level of S	Service H					
		La marca								
	leue may be	ionger.								
		-								
o cycles.	d by upstrea	m signal.								
o cycles. is metere		m signal.								
o cycles.		m signal.					1014			
o cycles. is metere		m signal.					∲⁄ø4 37 s			
•	EBU 74 74 0 pm+pt 5 2 5 5 5.0 10.6 24.0 20.0% 3.7 1.9 Lead Yes None	EBU EBL 74 230 74 230 74 230 0 320 pm+pt pm+pt 5 5 2 2 5 5 5.0 5.0 10.6 10.6 24.0 24.0 20.0% 20.0% 3.7 3.7 1.9 1.9 0.0 5.6 Lead Lead Yes Yes None None 88.1 0.73 0.80 57.7 0.0 57.7 0.10 57.7 0.10 70.0 398 0 0 0 0.80 0 0 0 0.80 0 0 0 0.80 0 0 0 0.80 0 0 0 <td>EBU EBL EBT 74 230 783 74 230 783 0 320 832 pm+pt pm+pt NA 5 5 2 2 2 2 5 5 2 5 5 2 5 5 2 5 5 2 5 5 2 5 5 2 5 5 2 5 5 2 5 5 2 5 5 2 5 5 2 50 5.0 10.0 10.6 10.6 23.6 24.0 24.0 83.0 20.0% 69.2% 3.7 3.7 3.7 3.7 1.9 1.9 1.9 0.0 0.0 0.0 0.73 0.73</td> <td>EBU EBL EBT WBL 74 230 783 1 74 230 783 1 0 320 832 1 pm+pt pm+pt NA Perm 5 5 2 6 5 5 2 6 5 5 2 6 5 5 2 6 5 5 2 6 5 5 2 6 5.0 5.0 10.0 10.0 10.6 10.6 23.6 23.6 24.0 24.0 83.0 59.0 20.0% 20.0% 69.2% 49.2% 3.7 3.7 3.7 1.7 1.9 1.9 1.9 1.9 0.0 0.0 0.0 0.0 5.6 5.6 5.6 Lead Lead Lag Yes Yes</td> <td>EBU EBL EBT WBL WBT 74 230 783 1 1679 74 230 783 1 1679 0 320 832 1 1924 pm+pt pm+pt NA Perm NA 5 5 2 6 6 2 2 6 6 6 5 5 2 6 6 5.0 5.0 10.0 10.0 10.0 10.6 10.6 23.6 23.6 23.6 24.0 24.0 83.0 59.0 59.0 20.0% 20.0% 69.2% 49.2% 49.2% 3.7 3.7 3.7 3.7 3.7 3.7 1.9 1.9 1.9 1.9 1.9 1.9 0.0 0.0 0.0 0.0 0.0 1.0 1.9 1.9 1.9 1.9 1.9 1.9<td>EBU EBL EBT WBL WBT NBL 74 230 783 1 1679 10 74 230 783 1 1679 10 0 320 832 1 1924 0 pm+pt pm+pt NA Perm NA Perm 5 5 2 6 8 5 5 5 2 6 8 5 5.0 5.0 10.0 10.0 10.0 10.0 10.6 10.6 23.6 23.6 37.0 23.6 37.0 24.0 24.0 83.0 59.0 59.0 37.0 20.0% 69.2% 49.2% 49.2% 30.8% 3.7 3.7 3.7 3.7 3.7 3.0 1.9 1.9 1.9 1.9 4.0 0 0 0 0.00 0.0 0.0 0.0 0 0</td><td>EBU EBI WBI WBI NBL NBI 74 230 783 1 1679 10 3 0 320 832 1 1679 10 3 0 320 832 1 1924 0 18 pm+pt pm+pt NA Perm NA Perm NA 2 2 6 8 8 5 5 2 6 8 8 5.0 5.0 10.0 10.0 10.0 10.0 10.0 10.0 10.6 10.6 23.6 23.6 23.6 37.0 37.0 20.0% 69.2% 49.2% 49.2% 30.8% 33.0 30 3.7 3.7 3.7 3.7 3.7 3.0 30 1.9 1.9 1.9 1.9 4.0 4.0 0.0 0.0 0.0 0.0 0.0 30.8 33.0 <td< td=""><td>EBU EBL EBT WBL WBT NBL NBT SBL 74 230 783 1 1679 10 3 127 74 230 783 1 1679 10 3 127 0 320 382 1 1924 0 18 0 pm+pt NA Perm NA Perm NA Perm NA 5 5 2 6 6 8 4 5.0 5.0 10.0 10.0 10.0 10.0 10.0 106 10.6 23.6 23.6 37.0 37.0 37.0 20.0% 69.2% 49.2% 30.8% 30.8% 30.8% 30.8% 3.7 3.7 3.7 3.7 3.7 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0</td><td>EBU EBL EBL WBL WBL NBL NB SBL SBL 74 230 783 1 1679 10 3 127 4 74 230 783 1 1679 10 3 127 4 74 230 783 1 1679 10 3 127 4 0 320 832 1 1924 0 18 0 138 pm+pt pm-pt NA Perm NA Perm NA Perm NA 4 5 5 2 6 6 8 4 4 5.0 5.0 10.0 10.0 10.0 10.0 10.0 10.0 10.6 10.6 23.6 23.6 37.0 37.0 37.0 37.0 37.0 37.0 37.0 37.0 37.0 37.0 30.0 30.8 30.8% 30.8% 30.8% <t< td=""><td>EBU EBU FBI WBT NBL NBL SBL SBT SBR 74 230 783 1 1679 10 3 127 4 138 74 230 783 1 1679 10 3 127 4 138 0 320 832 1 1924 0 18 0 138 145 pm+pt pm+pt NA Perm NA Perm NA Perm NA 4 4 4 2 2 6 8 8 4 4 4 5.0 10.0</td></t<></td></td<></td></td>	EBU EBL EBT 74 230 783 74 230 783 0 320 832 pm+pt pm+pt NA 5 5 2 2 2 2 5 5 2 5 5 2 5 5 2 5 5 2 5 5 2 5 5 2 5 5 2 5 5 2 5 5 2 5 5 2 5 5 2 50 5.0 10.0 10.6 10.6 23.6 24.0 24.0 83.0 20.0% 69.2% 3.7 3.7 3.7 3.7 1.9 1.9 1.9 0.0 0.0 0.0 0.73 0.73	EBU EBL EBT WBL 74 230 783 1 74 230 783 1 0 320 832 1 pm+pt pm+pt NA Perm 5 5 2 6 5 5 2 6 5 5 2 6 5 5 2 6 5 5 2 6 5 5 2 6 5.0 5.0 10.0 10.0 10.6 10.6 23.6 23.6 24.0 24.0 83.0 59.0 20.0% 20.0% 69.2% 49.2% 3.7 3.7 3.7 1.7 1.9 1.9 1.9 1.9 0.0 0.0 0.0 0.0 5.6 5.6 5.6 Lead Lead Lag Yes Yes	EBU EBL EBT WBL WBT 74 230 783 1 1679 74 230 783 1 1679 0 320 832 1 1924 pm+pt pm+pt NA Perm NA 5 5 2 6 6 2 2 6 6 6 5 5 2 6 6 5.0 5.0 10.0 10.0 10.0 10.6 10.6 23.6 23.6 23.6 24.0 24.0 83.0 59.0 59.0 20.0% 20.0% 69.2% 49.2% 49.2% 3.7 3.7 3.7 3.7 3.7 3.7 1.9 1.9 1.9 1.9 1.9 1.9 0.0 0.0 0.0 0.0 0.0 1.0 1.9 1.9 1.9 1.9 1.9 1.9 <td>EBU EBL EBT WBL WBT NBL 74 230 783 1 1679 10 74 230 783 1 1679 10 0 320 832 1 1924 0 pm+pt pm+pt NA Perm NA Perm 5 5 2 6 8 5 5 5 2 6 8 5 5.0 5.0 10.0 10.0 10.0 10.0 10.6 10.6 23.6 23.6 37.0 23.6 37.0 24.0 24.0 83.0 59.0 59.0 37.0 20.0% 69.2% 49.2% 49.2% 30.8% 3.7 3.7 3.7 3.7 3.7 3.0 1.9 1.9 1.9 1.9 4.0 0 0 0 0.00 0.0 0.0 0.0 0 0</td> <td>EBU EBI WBI WBI NBL NBI 74 230 783 1 1679 10 3 0 320 832 1 1679 10 3 0 320 832 1 1924 0 18 pm+pt pm+pt NA Perm NA Perm NA 2 2 6 8 8 5 5 2 6 8 8 5.0 5.0 10.0 10.0 10.0 10.0 10.0 10.0 10.6 10.6 23.6 23.6 23.6 37.0 37.0 20.0% 69.2% 49.2% 49.2% 30.8% 33.0 30 3.7 3.7 3.7 3.7 3.7 3.0 30 1.9 1.9 1.9 1.9 4.0 4.0 0.0 0.0 0.0 0.0 0.0 30.8 33.0 <td< td=""><td>EBU EBL EBT WBL WBT NBL NBT SBL 74 230 783 1 1679 10 3 127 74 230 783 1 1679 10 3 127 0 320 382 1 1924 0 18 0 pm+pt NA Perm NA Perm NA Perm NA 5 5 2 6 6 8 4 5.0 5.0 10.0 10.0 10.0 10.0 10.0 106 10.6 23.6 23.6 37.0 37.0 37.0 20.0% 69.2% 49.2% 30.8% 30.8% 30.8% 30.8% 3.7 3.7 3.7 3.7 3.7 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0</td><td>EBU EBL EBL WBL WBL NBL NB SBL SBL 74 230 783 1 1679 10 3 127 4 74 230 783 1 1679 10 3 127 4 74 230 783 1 1679 10 3 127 4 0 320 832 1 1924 0 18 0 138 pm+pt pm-pt NA Perm NA Perm NA Perm NA 4 5 5 2 6 6 8 4 4 5.0 5.0 10.0 10.0 10.0 10.0 10.0 10.0 10.6 10.6 23.6 23.6 37.0 37.0 37.0 37.0 37.0 37.0 37.0 37.0 37.0 37.0 30.0 30.8 30.8% 30.8% 30.8% <t< td=""><td>EBU EBU FBI WBT NBL NBL SBL SBT SBR 74 230 783 1 1679 10 3 127 4 138 74 230 783 1 1679 10 3 127 4 138 0 320 832 1 1924 0 18 0 138 145 pm+pt pm+pt NA Perm NA Perm NA Perm NA 4 4 4 2 2 6 8 8 4 4 4 5.0 10.0</td></t<></td></td<></td>	EBU EBL EBT WBL WBT NBL 74 230 783 1 1679 10 74 230 783 1 1679 10 0 320 832 1 1924 0 pm+pt pm+pt NA Perm NA Perm 5 5 2 6 8 5 5 5 2 6 8 5 5.0 5.0 10.0 10.0 10.0 10.0 10.6 10.6 23.6 23.6 37.0 23.6 37.0 24.0 24.0 83.0 59.0 59.0 37.0 20.0% 69.2% 49.2% 49.2% 30.8% 3.7 3.7 3.7 3.7 3.7 3.0 1.9 1.9 1.9 1.9 4.0 0 0 0 0.00 0.0 0.0 0.0 0 0	EBU EBI WBI WBI NBL NBI 74 230 783 1 1679 10 3 0 320 832 1 1679 10 3 0 320 832 1 1924 0 18 pm+pt pm+pt NA Perm NA Perm NA 2 2 6 8 8 5 5 2 6 8 8 5.0 5.0 10.0 10.0 10.0 10.0 10.0 10.0 10.6 10.6 23.6 23.6 23.6 37.0 37.0 20.0% 69.2% 49.2% 49.2% 30.8% 33.0 30 3.7 3.7 3.7 3.7 3.7 3.0 30 1.9 1.9 1.9 1.9 4.0 4.0 0.0 0.0 0.0 0.0 0.0 30.8 33.0 <td< td=""><td>EBU EBL EBT WBL WBT NBL NBT SBL 74 230 783 1 1679 10 3 127 74 230 783 1 1679 10 3 127 0 320 382 1 1924 0 18 0 pm+pt NA Perm NA Perm NA Perm NA 5 5 2 6 6 8 4 5.0 5.0 10.0 10.0 10.0 10.0 10.0 106 10.6 23.6 23.6 37.0 37.0 37.0 20.0% 69.2% 49.2% 30.8% 30.8% 30.8% 30.8% 3.7 3.7 3.7 3.7 3.7 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0</td><td>EBU EBL EBL WBL WBL NBL NB SBL SBL 74 230 783 1 1679 10 3 127 4 74 230 783 1 1679 10 3 127 4 74 230 783 1 1679 10 3 127 4 0 320 832 1 1924 0 18 0 138 pm+pt pm-pt NA Perm NA Perm NA Perm NA 4 5 5 2 6 6 8 4 4 5.0 5.0 10.0 10.0 10.0 10.0 10.0 10.0 10.6 10.6 23.6 23.6 37.0 37.0 37.0 37.0 37.0 37.0 37.0 37.0 37.0 37.0 30.0 30.8 30.8% 30.8% 30.8% <t< td=""><td>EBU EBU FBI WBT NBL NBL SBL SBT SBR 74 230 783 1 1679 10 3 127 4 138 74 230 783 1 1679 10 3 127 4 138 0 320 832 1 1924 0 18 0 138 145 pm+pt pm+pt NA Perm NA Perm NA Perm NA 4 4 4 2 2 6 8 8 4 4 4 5.0 10.0</td></t<></td></td<>	EBU EBL EBT WBL WBT NBL NBT SBL 74 230 783 1 1679 10 3 127 74 230 783 1 1679 10 3 127 0 320 382 1 1924 0 18 0 pm+pt NA Perm NA Perm NA Perm NA 5 5 2 6 6 8 4 5.0 5.0 10.0 10.0 10.0 10.0 10.0 106 10.6 23.6 23.6 37.0 37.0 37.0 20.0% 69.2% 49.2% 30.8% 30.8% 30.8% 30.8% 3.7 3.7 3.7 3.7 3.7 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0	EBU EBL EBL WBL WBL NBL NB SBL SBL 74 230 783 1 1679 10 3 127 4 74 230 783 1 1679 10 3 127 4 74 230 783 1 1679 10 3 127 4 0 320 832 1 1924 0 18 0 138 pm+pt pm-pt NA Perm NA Perm NA Perm NA 4 5 5 2 6 6 8 4 4 5.0 5.0 10.0 10.0 10.0 10.0 10.0 10.0 10.6 10.6 23.6 23.6 37.0 37.0 37.0 37.0 37.0 37.0 37.0 37.0 37.0 37.0 30.0 30.8 30.8% 30.8% 30.8% <t< td=""><td>EBU EBU FBI WBT NBL NBL SBL SBT SBR 74 230 783 1 1679 10 3 127 4 138 74 230 783 1 1679 10 3 127 4 138 0 320 832 1 1924 0 18 0 138 145 pm+pt pm+pt NA Perm NA Perm NA Perm NA 4 4 4 2 2 6 8 8 4 4 4 5.0 10.0</td></t<>	EBU EBU FBI WBT NBL NBL SBL SBT SBR 74 230 783 1 1679 10 3 127 4 138 74 230 783 1 1679 10 3 127 4 138 0 320 832 1 1924 0 18 0 138 145 pm+pt pm+pt NA Perm NA Perm NA Perm NA 4 4 4 2 2 6 8 8 4 4 4 5.0 10.0

59 s

Projected 2024 PM 4: Kirkwood & Carling WB

	4	+	•	1	ţ	4
Lane Group	WBL	WBT	NBL	NBT	SBT	SBR
Lane Configurations	ካካ	11	ň	<u> </u>	1001	7
Traffic Volume (vph)	209	2408	227	545	481	410
Future Volume (vph)	209	2408	227	545	481	410
Lane Group Flow (vph)	220	2867	239	574	506	432
Turn Type	Prot	NA	pm+pt	NA	NA	Perm
Protected Phases	1	6	3	8	4	
Permitted Phases			8			4
Detector Phase	1	6	3	8	4	4
Switch Phase						
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	16.3	35.3	11.0	29.0	29.0	29.0
Total Split (s)	67.0	67.0	20.0	53.0	33.0	33.0
Total Split (%)	55.8%	55.8%	16.7%	44.2%	27.5%	27.5%
Yellow Time (s)	3.7	3.7	3.3	3.3	3.3	3.3
All-Red Time (s)	2.6	2.6	2.7	2.7	2.7	2.7
Lost Time Adjust (s)	-2.3	-2.3	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	C-Max	None	Ped	Ped	Ped
Act Effct Green (s)	63.0	63.0	49.0	49.0	29.5	29.5
Actuated g/C Ratio	0.52	0.52	0.41	0.41	0.25	0.25
v/c Ratio	0.12	1.15	0.71	0.79	0.61	1.05
Control Delay	8.3	92.6	33.9	39.6	43.9	93.6
Queue Delay	0.0	0.0	0.0	5.3	0.0	0.0
Total Delay	8.3	92.6	33.9	44.9	43.9	93.6
LOS	A	72.0 F	C	D	43.7 D	73.0 F
Approach Delay	/、	86.6	Ŭ	41.7	66.8	
Approach LOS		F		D	E	
Queue Length 50th (m)	6.7	~296.0	47.1	135.6	56.2	~96.0
Queue Length 95th (m)	m8.8	#323.0	65.3	177.8	74.2	#158.3
Internal Link Dist (m)	110.0	113.3	00.0	144.7	73.8	"150.5
Turn Bay Length (m)	40.0	113.3		174.7	15.0	22.0
Base Capacity (vph)	1726	2496	345	728	834	412
Starvation Cap Reductn	0	2490	545 0	103	034 0	412
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductin	0	0	0	0	0	0
Reduced v/c Ratio	0.13	1.15	0.69	0.92	0.61	0 1.05
Reduced NC Kallo	0.13	1.15	0.09	0.92	0.61	1.05
Intersection Summary						
Cycle Length: 120						
Actuated Cycle Length: 120						
Offset: 39 (33%), Referenced to pha	ase 6:WBT, S	start of Gree	n			
Natural Cycle: 110						
Control Type: Actuated-Coordinated	ł					
Maximum v/c Ratio: 1.15						
Intersection Signal Delay: 75.2				Int	ersection L	OS: E
Intersection Capacity Utilization 110).1%				U Level of S	
Analysis Period (min) 15				10	2 20101010	
 Volume exceeds capacity, queu 	e is theoretic	ally infinite				
Queue shown is maximum after t		any minito.				
# 95th percentile volume exceeds		eue may he	longer			
Queue shown is maximum after t		suc may be	longer.			
m Volume for 95th percentile queu		by upstream	m signal			
		, "	orginali			
Splits and Phases: 4: Kirkwood &	Carling WB					4
√ Ø1						Ø 3
67 s						20 c

√ Ø1	↑ Ø3 ↓ Ø4
67 s	20 s 33 s
● ● Ø6 (R)	<1Ø8
67 s	53 s

Projected 2024 PM 5: Merivale & Thames

	٦	-	*	4	+	•	•	1	1	*	Ŧ	~
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4			\$			4î îr			4î b	
Traffic Volume (veh/h)	8	0	22	0	0	3	37	576	2	4	887	60
Future Volume (Veh/h)	8	0	22	0	0	3	37	576	2	4	887	60
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	8	0	23	0	0	3	39	606	2	4	934	63
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)											186	
pX, platoon unblocked												
vC, conflicting volume	1358	1660	498	1183	1690	304	997			608		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1358	1660	498	1183	1690	304	997			608		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	92	100	96	100	100	100	94			100		
cM capacity (veh/h)	102	91	517	132	87	692	690			966		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	31	3	342	305	471	530						
Volume Left	8	0	39	0	4/1	0						
Volume Right	23	3	0	2	4	63						
cSH	253	692	690	1700	966	1700						
Volume to Capacity	0.12	0.00	0.06	0.18	0.00	0.31						
Queue Length 95th (m)	3.1	0.00	1.4	0.18	0.00	0.51						
	21.2		1.4			0.0						
Control Delay (s) Lane LOS	21.2 C	10.2 B	1.8 A	0.0	0.1 A	0.0						
	21.2		A 1.0		0.1							
Approach Delay (s) Approach LOS	21.2 C	10.2 B	1.0		0.1							
Intersection Summary	5	5										
			0.0									
Average Delay			0.8	101	L avail of C				D			
Intersection Capacity Utilization			61.5%	ICI	J Level of S	ervice			В			
Analysis Period (min)			15									

Appendix K SYNCHRO Capacity Analysis – Modified Projected 2024

Projected 2024 AM - Modified 1: Kirkwood & Carling EB

	٦	-	*	1	1	1	ţ
Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Configurations	7	₽₽₽	1	††	1	ň	1
Traffic Volume (vph)	187	1959	187	369	339	351	439
Future Volume (vph)	187	1959	187	369	339	351	439
Lane Group Flow (vph)	177	2082	197	388	357	369	462
Turn Type	Perm	NA	Perm	NA	Perm	pm+pt	NA
Protected Phases		2		8		7	4
Permitted Phases	2		2		8	4	
Detector Phase	2	2	2	8	8	7	4
Switch Phase							
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	5.0	10.0
Minimum Split (s)	29.2	29.2	29.2	26.1	26.1	10.1	26.1
Total Split (s)	63.0	63.0	63.0	37.0	37.0	20.0	57.0
Total Split (%)	52.5%	52.5%	52.5%	30.8%	30.8%	16.7%	47.5%
Yellow Time (s)	3.7	3.7	3.7	3.3	3.3	3.3	3.3
All-Red Time (s)	2.5	2.5	2.5	2.8	2.8	1.8	2.8
Lost Time Adjust (s)	-2.2	-2.2	-2.2	-2.1	-2.1	-1.1	-2.1
Total Lost Time (s)	-2.2	-2.2	-2.2	-2.1	-2.1	-1.1	-2.1
	4.0	4.0	4.0				4.0
Lead/Lag				Lag	Lag	Lead	
Lead-Lag Optimize?	0.14	0.14	0.14	Yes	Yes	Yes	
Recall Mode	C-Max	C-Max	C-Max	Min	Min	Min	Min
Act Effct Green (s)	60.2	60.2	60.2	31.8	31.8	51.8	51.8
Actuated g/C Ratio	0.50	0.50	0.50	0.26	0.26	0.43	0.43
v/c Ratio	0.24	0.90	0.25	0.43	0.89	0.89	0.60
Control Delay	18.5	34.1	5.1	38.1	67.1	52.0	30.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.5
Total Delay	18.5	34.1	5.1	38.1	67.1	52.0	30.7
LOS	В	С	А	D	E	D	С
Approach Delay		30.7		52.0			40.2
Approach LOS		С		D			D
Queue Length 50th (m)	27.2	171.1	4.7	39.4	79.9	76.7	98.0
Queue Length 95th (m)	44.1	197.2	17.0	53.9	#130.1	#132.0	138.9
Internal Link Dist (m)		161.6		158.6			152.2
Turn Bay Length (m)	40.0	. 51.0			90.0		
Base Capacity (vph)	730	2310	798	932	417	413	787
Starvation Cap Reductn	0	0	0	0	0	0	87
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.90	0.25	0.42	0.86	0.89	0.66
	0.24	0.90	0.20	0.42	0.00	0.89	0.00
Intersection Summary							
Cycle Length: 120							
Actuated Cycle Length: 120							
Offset: 15 (13%), Referenced to pha	ase 2:EBTL	Start of Gree	en				
Natural Cycle: 90							
Control Type: Actuated-Coordinated	4						
Maximum v/c Ratio: 0.90							
Intersection Signal Delay: 36.6				In	toreaction	05.0	
	70/				tersection L		
Intersection Capacity Utilization 85.	/ 70			IC	CU Level of S	SELVICE E	
Analysis Period (min) 15	anne -lli		langer:				
# 95th percentile volume exceeds		eue may be	ionger.				
Queue shown is maximum after	two cycles.						
Splits and Phases: 1: Kirkwood &	Carling EB				- 1		
⊷Ø2 (R)					57	Ø4	
63 s					5/		
						Ø 7	
					20	S	

Projected 2024 AM - Modified 2: Merivale & Carling

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Lane Group	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	<u>ተተ</u> ኑ	7	ተተጉ	۲	1	1	ň	1	1	
Traffic Volume (vph)	1007	188	591	167	243	352	43	278	238	
Future Volume (vph)	1007	188	591	167	243	352	43	278	238	
Lane Group Flow (vph)	1183	198	666	176	256	371	45	293	251	
Turn Type	NA	pm+pt	NA	Prot	NA	Perm	Prot	NA	Perm	
Protected Phases	2	1	6	3	8		7	4		
Permitted Phases		6	-	-	-	8			4	
Detector Phase	2	1	6	3	8	8	7	4	4	
Switch Phase	-	•	0	Ū	Ŭ	Ū	•	•	•	
/inimum Initial (s)	10.0	5.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	
finimum Split (s)	29.0	10.4	29.0	11.3	37.7	37.7	11.3	37.7	37.7	
otal Split (s)	49.0	12.0	61.0	21.0	38.0	38.0	21.0	38.0	38.0	
otal Split (%)	40.8%	10.0%	50.8%	17.5%	31.7%	31.7%	17.5%	31.7%	31.7%	
ellow Time (s)	3.7	3.7	3.7	3.3	3.3	3.3	3.3	3.3	3.3	
I-Red Time (s)	2.3	1.7	2.3	3.0	3.4	3.4	3.0	3.4	3.4	
ost Time Adjust (s)	-2.0	-1.4	-2.0	-2.3	-2.7	-2.7	-2.3	-2.7	-2.7	
otal Lost Time (s)	-2.0	-1.4	-2.0 4.0	-2.3	-2.7	-2.7	-2.3	-2.7	-2.7	
ad/Lag	4.0 Lag	Lead	4.0	Lead	4.0 Lag	4.0 Lag	Lead	Lag	4.0 Lag	
ead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	
ecall Mode	C-Max	None	C-Max	None	None	None	None	None	None	
ct Effct Green (s)	46.5	64.0	64.0	16.4	35.5	35.5	10.9	27.6	27.6	
ctuated g/C Ratio	40.5 0.39	0.53	0.53	0.14	35.5 0.30	35.5 0.30	0.09	0.23	0.23	
c Ratio	0.64	0.71 36.1	0.26 16.0	0.76	0.49	0.58 12.2	0.29 55.0	0.71 52.1	0.53 15.7	
ontrol Delay	33.9			71.1	38.5					
ueue Delay	3.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
tal Delay	37.3	36.1	16.0	71.1	38.5	12.2	55.0	52.1	15.7	
IS	D	D	B	E	D	В	D	D	В	
proach Delay	37.3		20.6		33.5			36.8		
proach LOS	D	04.0	С	10.0	С	44.0	10.4	D	10 5	
ieue Length 50th (m)	54.2	24.3	30.0	40.2	50.2	14.2	10.1	63.4	13.5	
ueue Length 95th (m)	121.5	#74.6	42.1	#71.5	73.5	43.5	21.2	87.7	36.2	
ernal Link Dist (m)	89.4	00.0	139.3	40.0	159.9		20.0	100.7	25.0	
rn Bay Length (m)	1050	90.0	25(2	40.0	F 2 2	(10	28.0	FOF	35.0	
ise Capacity (vph)	1859	277	2563	240	533	640	240	505	537	
arvation Cap Reductn	562	0	0	0	0	0	0	0	0	
billback Cap Reductn	0	0	0	0	0	0	0	0	0	
orage Cap Reductn	0	0	0	0	0	0	0	0	0	
educed v/c Ratio	0.91	0.71	0.26	0.73	0.48	0.58	0.19	0.58	0.47	
ersection Summary										
cle Length: 120										
tuated Cycle Length: 120										
fset: 54 (45%), Referenced to pl	hase 2:EBT an	d 6:WBTL,	Start of Gree	en						
atural Cycle: 90										
ontrol Type: Actuated-Coordinate	ed									
aximum v/c Ratio: 0.76										
tersection Signal Delay: 32.1				Int	ersection L(DS: C				
ersection Capacity Utilization 79	9.5%				U Level of S					
alysis Period (min) 15										
95th percentile volume exceed	ls capacity, que	eue mav be	longer.							
Queue shown is maximum afte		J 30	J							
lits and Phases: 2: Merivale &										
/	2 Juning				•	10		* ~.		
✓ Ø1 → Ø2 (R)					1	03		¥ Ø4		
2 s 49 s					21 s			38 s ▲		
🗸 Ø6 (R) 🏮					¢.	07		₽ø8		
1 s					21 s			38 s		

Projected 2024 AM - Modified 3: Carling & Westgate SC

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Lane Group	EBU	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR	
Lane Configurations		N.	ተተኈ	۲	ተተኈ		\$		र्स	1	
Traffic Volume (vph)	128	273	995	2	780	16	2	67	0	76	
Future Volume (vph)	128	273	995	2	780	16	2	67	0	76	
Lane Group Flow (vph)	0	422	1061	2	910	0	24	0	71	80	
Turn Type	pm+pt	pm+pt	NA	Perm	NA	Perm	NA	Perm	NA	Perm	
Protected Phases	5	5	2		6		8		4		
Permitted Phases	2	2		6		8		4		4	
Detector Phase	5	5	2	6	6	8	8	4	4	4	
Switch Phase											
Vinimum Initial (s)	5.0	5.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	10.9	10.9	23.6	23.6	23.6	37.0	37.0	37.0	37.0	37.0	
Total Split (s)	24.0	24.0	83.0	59.0	59.0	37.0	37.0	37.0	37.0	37.0	
Fotal Split (%)	20.0%	20.0%	69.2%	49.2%	49.2%	30.8%	30.8%	30.8%	30.8%	30.8%	
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	2.2	2.2	1.9	1.9	1.9	4.0	4.0	4.0	4.0	4.0	
_ost Time Adjust (s)		-1.9	-1.6	-1.6	-1.6		-3.0		-3.0	-3.0	
Fotal Lost Time (s)		4.0	4.0	4.0	4.0		4.0		4.0	4.0	
Lead/Lag	Lead	Lead		Lag	Lag						
Lead-Lag Optimize?	Yes	Yes		Yes	Yes						
Recall Mode	None	None	C-Max	C-Max	C-Max	None	None	None	None	None	
Act Effct Green (s)		93.8	93.8	71.1	71.1		18.2		18.2	18.2	
Actuated q/C Ratio		0.78	0.78	0.59	0.59		0.15		0.15	0.15	
//c Ratio		0.77	0.28	0.01	0.32		0.11		0.36	0.27	
Control Delay		17.1	8.0	21.5	15.0		34.6		48.6	10.4	
Queue Delay		0.0	0.0	0.0	0.4		0.0		0.1	0.0	
Fotal Delay		17.1	8.1	21.5	15.3		34.6		48.7	10.4	
_OS		В	A	С	В		С		D	В	
Approach Delay		5	10.6		15.4		34.6		28.4	5	
Approach LOS			B		В		C		C		
Queue Length 50th (m)		39.7	33.1	0.1	24.6		4.0		15.7	0.0	
Queue Length 95th (m)		m86.4	m72.4	m0.9	68.7		10.0		25.1	11.6	
nternal Link Dist (m)		1100.1	168.6	110.7	89.4		10.8		75.6	11.0	
Furn Bay Length (m)		70.0	100.0	36.0	07.1		10.0		70.0		
Base Capacity (vph)		571	3798	270	2828		382		357	464	
Starvation Cap Reductn		0	0	0	1244		0		0	0	
Spillback Cap Reductn		0	600	0	0		0		42	0	
Storage Cap Reductn		0	000	0	0		0		42	0	
Reduced v/c Ratio		0.74	0.33	0.01	0.57		0.06		0.23	0.17	
ntersection Summary											
Cycle Length: 120											
Actuated Cycle Length: 120											
Offset: 0 (0%), Referenced to phase	2:EBTL and	6:WBTL S	tart of Gree	n							
Vatural Cycle: 80	/ L unu			••							
Control Type: Actuated-Coordinated											
Aaximum v/c Ratio: 0.77											
ntersection Signal Delay: 13.6				In	tersection L	S. B					
ntersection Capacity Utilization 83.5	%				U Level of S						
Analysis Period (min) 15	70			IC							
m Volume for 95th percentile queu	e is metered	l by upstrea	m signal.								
		5 1 1	U U								
Splits and Phases: 3: Carling & We	estgate SC							_			

₫ Ø2 (R)	•	₩ Ø4
83 s		37 s
⋬ _{Ø5}	🛛 🕶 🖉 Ø6 (R)	▲↑ Ø8
24 s	59 s	37 s

Projected 2024 AM - Modified 4: Kirkwood & Carling WB

	4	-	1	Ť	Ļ	1
Lane Group	WBL	WBT	NBL	NBT	SBT	SBR
Lane Configurations	ኘ	4 † †		1	<u> </u>	1
Traffic Volume (vph)	351	1280	280	307	352	360
Future Volume (vph)	351	1280	280	307	352	360
Lane Group Flow (vph)	369	1611	295	323	371	379
Turn Type	Prot	NA	pm+pt	NA	NA	Perm
Protected Phases	1	6	3	8	4	
Permitted Phases			8			4
Detector Phase	1	6	3	8	4	4
Switch Phase						
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	16.3	35.3	11.0	29.0	29.0	29.0
Total Split (s)	56.0	56.0	26.0	64.0	38.0	38.0
Total Split (%)	46.7%	46.7%	21.7%	53.3%	31.7%	31.7%
Yellow Time (s)	3.7	3.7	3.3	3.3	3.3	3.3
All-Red Time (s)	2.6	2.6	2.7	2.7	2.7	2.7
Lost Time Adjust (s)	-2.3	-2.3	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	1.0	1.0	Lead	1.0	Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	C-Max	None	Ped	Ped	Ped
Act Effct Green (s)	56.9	56.9	55.1	55.1	31.1	31.1
Actuated g/C Ratio	0.47	0.47	0.46	0.46	0.26	0.26
v/c Ratio	0.47	0.47	0.40	0.40	0.20	0.20
Control Delay	21.0	29.4	18.7	14.3	38.1	48.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	40.9
Total Delay	21.0	29.4	18.7	14.3	38.1	48.9
LOS	21.0 C	29.4 C	10.7 B	14.3 B	30.1 D	40.9 D
Approach Delay	U	27.9	D	ь 16.4	43.6	U
Approach LOS		27.9 C		10.4 B	43.0 D	
Queue Length 50th (m)	29.1	124.2	49.6	Б 54.6	37.1	62.9
	29.1 44.4	124.2 146.9	49.6 m70.8	54.6 m76.4	37.1 51.0	62.9 #109.2
Queue Length 95th (m)	44.4	146.9	111/U.ŏ	152.2	51.0 73.8	#109.2
Internal Link Dist (m)	40.0	110.3		102.2	/3.8	22.0
Turn Bay Length (m)	40.0	2220	400	000	0/0	22.0
Base Capacity (vph)	1558	2239	489	892	960	480
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.72	0.60	0.36	0.39	0.79
Intersection Summary						
Cycle Length: 120						
Actuated Cycle Length: 120						
Offset: 66 (55%), Referenced to ph	nase 6:WBT, S	tart of Gree	n			
Natural Cycle: 80						
Control Type: Actuated-Coordinate	ed					
Maximum v/c Ratio: 0.85						
Intersection Signal Delay: 29.3				In	tersection L	OS: C
Intersection Capacity Utilization 85	5.7%				U Level of S	
Analysis Period (min) 15				10		
# 95th percentile volume exceed	s capacity, que	eue may be	longer			
Queue shown is maximum after						
m Volume for 95th percentile que		by upstrea	m signal			
an volume for your percentile que		by upsiled	ni siyilal.			
Splits and Phases: 4: Kirkwood	& Carling WB					
					•	
1					T (20)	

√ Ø1	↑ ø3 ↓ ø4
56 s	26 s 38 s
, ← Ø6 (R)	<¶ø8
56 s	64 s

Projected 2024 PM - Modified 1: Kirkwood & Carling EB

1: Kirkwood & Carling EE							
	٦	-	\mathbf{r}	1	1	×	Ļ
Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Configurations	۲	4412	1	††	1	٢	1
Traffic Volume (vph)	419	1344	330	328	258	320	372
Future Volume (vph)	419	1344	330	328	258	320	372
Lane Group Flow (vph)	392	1464	347	345	272	337	392
Turn Type	Perm	NA	Perm	NA	Perm	pm+pt	NA
Protected Phases		2		8		7	4
Permitted Phases	2		2		8	4	
Detector Phase	2	2	2	8	8	7	4
Switch Phase							
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	5.0	10.0
Minimum Split (s)	29.2	29.2	29.2	26.1	26.1	10.1	26.1
Total Split (s)	61.0	61.0	61.0	29.0	29.0	30.0	59.0
Total Split (%)	50.8%	50.8%	50.8%	24.2%	24.2%	25.0%	49.2%
Yellow Time (s)	3.7	3.7	3.7	3.3	3.3	3.3	3.3
All-Red Time (s)	2.5	2.5	2.5	2.8	2.8	1.8	2.8
Lost Time Adjust (s)	-2.2	-2.2	-2.2	-2.1	-2.1	-1.1	-2.1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	ъ. 0	J.F	0.1	Lag	Lag	Lead	-1.U
Lead-Lag Optimize?				Yes	Yes	Yes	
Recall Mode	C-Max	C-Max	C-Max	Min	Min	Min	Min
Act Effct Green (s)	58.8	58.8	58.8	24.4	24.4	53.2	53.2
Actuated g/C Ratio	0.49	0.49	0.49	0.20	0.20	0.44	0.44
v/c Ratio	0.55	0.47	0.41	0.20	0.20	0.69	0.50
Control Delay	25.6	25.0	5.9	45.1	75.6	16.8	12.1
Queue Delay	0.4	0.1	0.0	0.0	0.0	0.0	0.0
Total Delay	26.0	25.2	5.9	45.1	75.6	16.8	12.1
LOS	20:0 C	23.2 C	A		, J.U	B	B
Approach Delay	U	22.3	Δ.	58.6	L	U	14.3
Approach LOS		22.J C		50.0 E			14.3 B
Queue Length 50th (m)	75.1	100.2	8.8	37.9	62.3	40.8	73.9
Queue Length 95th (m)	110.9	117.5	27.9	52.7	#108.3	40.8	102.2
Internal Link Dist (m)	110.7	161.6	∠1.7	158.6	#100.5	00.0	144.7
Turn Bay Length (m)	40.0	101.0		130.0	90.0		144.7
Base Capacity (vph)	713	2252	843	707	316	501	817
Starvation Cap Reductn	0	2252	043	0	0	0	017
Spillback Cap Reductin	68	144	0	0	0	0	0
Storage Cap Reductn	00	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.69	0.41	0.49	0.86	0.67	0.48
NEUULEU VIL NAIIU	0.01	0.09	0.41	0.49	0.00	0.07	0.40
Intersection Summary							
Cycle Length: 120							
Actuated Cycle Length: 120							
Offset: 81 (68%), Referenced to p	hase 2:EBTL, 3	Start of Gree	en				
Natural Cycle: 70							
Control Type: Actuated-Coordinate	ed						
Maximum v/c Ratio: 0.88							
Intersection Signal Delay: 27.0				In	tersection LC	DS: C	
Intersection Capacity Utilization 1	10.1%				CU Level of S		
Analysis Period (min) 15							
# 95th percentile volume exceed	ds capacity, qu	eue may be	longer.				
Queue shown is maximum after		<u> </u>	J				
Splits and Phases: 1: Kirkwood	& Carling EB						
≠ø2 (R)	<u> </u>				↓	Ø4	
61 s					59 s		
					1		
					- No.		
					>> 30 s	07	

Projected 2024 PM - Modified 2: Merivale & Carling

	+	4	Ļ	<	Ť	1	1	Ļ	1	
Lane Group	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	<u>ተተ</u> ኑ	٢	ተተቡ	۲	1	1	٢	1	1	
Traffic Volume (vph)	696	462	1550	135	207	245	77	294	122	
Future Volume (vph)	696	462	1550	135	207	245	77	294	122	
Lane Group Flow (vph)	938	486	1731	142	218	258	81	309	128	
Turn Type	NA	pm+pt	NA	Prot	NA	Perm	Prot	NA	Perm	
Protected Phases	2	phi pi	6	3	8	T GIIII	7	4	i cim	
Permitted Phases	2	6	0	5	0	8	,	т	4	
Detector Phase	2	1	6	3	8	8	7	4	4	
Switch Phase	2	1	0	J	0	U	1	4	4	
Vinimum Initial (s)	10.0	5.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	
	29.0	10.4	29.0	11.3	37.7	37.7	11.3	37.7	37.7	
/inimum Split (s)										
otal Split (s)	30.0	36.0	66.0	16.0	40.0	40.0	14.0	38.0	38.0	
otal Split (%)	25.0%	30.0%	55.0%	13.3%	33.3%	33.3%	11.7%	31.7%	31.7%	
ellow Time (s)	3.7	3.7	3.7	3.3	3.3	3.3	3.3	3.3	3.3	
II-Red Time (s)	2.3	1.7	2.3	3.0	3.4	3.4	3.0	3.4	3.4	
ost Time Adjust (s)	-2.0	-1.4	-2.0	-2.3	-2.7	-2.7	-2.3	-2.7	-2.7	
otal Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
ead/Lag	Lag	Lead		Lead	Lag	Lag	Lead	Lag	Lag	
ead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	
ecall Mode	C-Max	None	C-Max	None	None	None	None	None	None	
ct Effct Green (s)	30.7	67.8	67.8	12.0	33.0	33.0	9.8	28.2	28.2	
ctuated g/C Ratio	0.26	0.56	0.56	0.10	0.28	0.28	0.08	0.24	0.24	
c Ratio	0.76	0.92	0.64	0.84	0.44	0.44	0.59	0.74	0.29	
ontrol Delay	34.7	55.1	19.7	90.7	39.2	6.3	70.7	52.9	6.7	
ieue Delay	0.4	0.0	2.3	0.0	0.0	0.0	0.0	0.0	0.0	
tal Delay	35.1	55.1	22.0	90.7	39.2	6.3	70.7	52.9	6.7	
S	D	E	С	F	D	А	E	D	А	
proach Delay	35.1		29.3		37.3			44.2		
proach LOS	D		С		D			D		
ueue Length 50th (m)	46.5	91.1	97.0	33.4	43.7	0.0	18.7	67.4	0.0	
ueue Length 95th (m)	#70.7	#165.5	125.0	#68.2	63.2	18.8	#36.9	92.8	13.0	
ernal Link Dist (m)	81.2		139.3		161.9			100.7		
rn Bay Length (m)		90.0		40.0			28.0		35.0	
ise Capacity (vph)	1233	541	2717	169	536	619	141	505	510	
arvation Cap Reductn	60	0	0	0	0	0	0	0	0	
billback Cap Reductn	0	0	812	0	0	Ű	0	0	22	
orage Cap Reductn	0	0	0	0	0	0	0	0	0	
educed v/c Ratio	0.80	0.90	0.91	0.84	0.41	0.42	0.57	0.61	0.26	
	0.00	0.70	0.71	0.01	0.11	0.12	0.07	0.01	0.20	
ersection Summary cle Length: 120 tuated Cycle Length: 120 fset: 15 (13%), Referenced to p tural Cycle: 110 introl Type: Actuated-Coordinat aximum v/c Ratio: 0.92 ersection Signal Delay: 33.5 ersection Capacity Utilization 86	ed	d 6:WBTL,	Start of Gree	Int	ersection L0					
nalysis Period (min) 15 95th percentile volume exceed Queue shown is maximum afte plits and Phases: 2: Merivale	ds capacity, que er two cycles.	eue may be	longer.	ιU	O LEVELOI 3	ICI VILE E				
Ø1		∎ →ø	2 (R)			▲ ø3		∲ Ø4		
36 s		30 s				16 s		38 s		
Ø6 (R)						Ø7		Ø8		

14 s 40 s

66 s

Projected 2024 PM - Modified 3: Carling & Westgate SC

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Lane Group	EBU	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR	
Lane Configurations		ă	ተተኈ	٦	ተተኈ		4		÷.	1	
Traffic Volume (vph)	74	230	783	1	1679	10	3	127	4	138	
Future Volume (vph)	74	230	783	1	1679	10	3	127	4	138	
Lane Group Flow (vph)	0	320	832	1	1924	0	18	0	138	145	
Turn Type	pm+pt	pm+pt	NA	Perm	NA	Perm	NA	Perm	NA	Perm	
Protected Phases	5	5	2		6		8		4		
Permitted Phases	2	2	_	6		8		4		4	
Detector Phase	5	5	2	6	6	8	8	4	4	4	
Switch Phase	5.0	5.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	
Minimum Initial (s)	5.0	5.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	10.6	10.6	23.6	23.6	23.6	37.0	37.0	37.0	37.0	37.0	
Total Split (s)	24.0 20.0%	24.0 20.0%	83.0 69.2%	59.0 49.2%	59.0	37.0	37.0	37.0	37.0	37.0 30.8%	
Total Split (%) Yellow Time (s)	20.0%	20.0%	09.2% 3.7	49.2% 3.7	49.2% 3.7	30.8% 3.0	30.8% 3.0	30.8% 3.0	30.8% 3.0	30.8%	
All-Red Time (s)	3.7 1.9	3.7 1.9	3.7 1.9	3.7 1.9	3.7 1.9	3.0 4.0	3.0 4.0	3.0 4.0	3.0 4.0	4.0	
Lost Time Adjust (s)	1.7	-1.6	-1.6	-1.6	-1.6	4.0	-3.0	4.0	-3.0	-3.0	
Total Lost Time (s)		4.0	4.0	-1.0	-1.0		4.0		-3.0	-3.0	
Lead/Lag	Lead	4.0 Lead	4.0	4.0 Lag	4.0 Lag		4.0		4.0	4.0	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes						
Recall Mode	None	None	C-Max	C-Max	C-Max	None	None	None	None	None	
Act Effct Green (s)	NULL	89.7	89.7	62.0	62.0	NOTIC	22.3	NOTIC	22.3	22.3	
Actuated g/C Ratio		0.75	0.75	0.52	0.52		0.19		0.19	0.19	
v/c Ratio		0.81	0.23	0.00	0.78		0.07		0.60	0.39	
Control Delay		58.5	3.0	9.0	18.4		30.8		54.1	12.7	
Queue Delay		0.0	0.0	0.0	1.3		0.0		0.0	0.0	
Total Delay		58.5	3.0	9.0	19.7		30.8		54.1	12.7	
LOS		E	А	A	В		С		D	В	
Approach Delay			18.4		19.7		30.8		32.9		
Approach LOS			В		В		С		С		
Queue Length 50th (m)		59.2	10.4	0.1	148.0		2.8		30.3	4.6	
Queue Length 95th (m)		m#115.8	m17.0	m0.1	182.6		8.1		45.7	19.7	
Internal Link Dist (m)			162.3		81.2		10.8		75.6		
Turn Bay Length (m)		70.0		36.0							
Base Capacity (vph)		398	3634	292	2477		390		343	488	
Starvation Cap Reductn		0	0	0	332		0		0	0	
Spillback Cap Reductn		0	4	0	0		0		0	0	
Storage Cap Reductn		0	0	0	0		0		0	0	
Reduced v/c Ratio		0.80	0.23	0.00	0.90		0.05		0.40	0.30	
Intersection Summary											
Cycle Length: 120											
Actuated Cycle Length: 120											
Offset: 3 (3%), Referenced to phase	2:EBTL and	d 6:WBTL, S	tart of Gree	n							
Natural Cycle: 100											
Control Type: Actuated-Coordinated											
Maximum v/c Ratio: 0.81											
Intersection Signal Delay: 20.4	10/				tersection LC						
Intersection Capacity Utilization 105	. 1 70			IC	U Level of S	ervice G					
Analysis Period (min) 15 # 95th percentile volume exceeds	canacity a	alla may ba	longer								
Queue shown is maximum after t		ieue may be	ionger.								
m Volume for 95th percentile queu		d by upstrea	m signal.								
Splits and Phases: 3: Carling & W	/estgate SC										
⁴ Ø2 (R) ■								∲ ø4			
83 s								37 s			
≸ _{Ø5} •	🕈 Ø6 (R)						≜ ¶			
24 a	-0 c							27.6			

24

59 s

7 s

Projected 2024 PM - Modified 4: Kirkwood & Carling WB

	4	+	•	1	Ļ	1	
Lane Group	WBL	WBT	NBL	NBT	SBT	SBR	
Lane Configurations	<u>ነ</u> ካ	† †î>		↑	<u></u>	7	
Traffic Volume (vph)	209	2408	227	545	481	410	
Future Volume (vph)	209	2408	227	545	481	410	
Lane Group Flow (vph)	220	2867	239	574	506	432	
Turn Type	Prot	NA	pm+pt	NA	NA	Perm	
Protected Phases	1	6	3	8	4	1 01111	
Permitted Phases			8			4	
Detector Phase	1	6	3	8	4	4	
Switch Phase							
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0	
Minimum Split (s)	16.3	35.3	11.0	29.0	29.0	29.0	
Total Split (s)	74.0	74.0	13.0	46.0	33.0	33.0	
Total Split (%)	61.7%	61.7%	10.8%	38.3%	27.5%	27.5%	
Yellow Time (s)	3.7	3.7	3.3	3.3	3.3	3.3	
All-Red Time (s)	2.6	2.6	2.7	2.7	2.7	2.7	
Lost Time Adjust (s)	-2.3	-2.3	-2.0	-2.0	-2.0	-2.0	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	
Lead/Lag	4.0	4.0	Lead	4.0	Lag	Lag	
Lead-Lag Optimize?			Yes		Yes	Yes	
Recall Mode	None	C-Max	None	Ped	Ped	Ped	
Act Effct Green (s)	70.0	70.0	42.0	42.0	29.0	29.0	
Actuated g/C Ratio	0.58	0.58	42.0	42.0	0.24	0.24	
v/c Ratio	0.58	0.58	0.35	0.35	0.24	0.24	
Control Delay	11.4	51.9	0.98 83.6	0.92 57.9	44.4	98.2	
Queue Delay	0.0	0.0	0.0	14.7	44.4 0.0	90.2	
Total Delay	11.4	51.9	83.6	72.6	44.4	98.2	
LOS	11.4 B	51.9 D	03.0 F	72.0 E	44.4 D	90.2 F	
	В	49.0	г	75.9		Г	
Approach Delay		49.0 D			69.2		
Approach LOS	11.0		F2 2	E	E	0/ 0	
Queue Length 50th (m)	11.2	~264.7	52.2	141.6	56.2	~96.0	
Queue Length 95th (m)	16.9	#291.6	#104.3	#202.8	74.2	#158.3	
Internal Link Dist (m)	40.0	113.3		144.7	73.8	22.0	
Turn Bay Length (m)	40.0	0770	044	(04	010	22.0	
Base Capacity (vph)	1918	2772	244	624	819	406	
Starvation Cap Reductn	0	0	0	55	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.11	1.03	0.98	1.01	0.62	1.06	
Intersection Summary							
Cycle Length: 120							
Actuated Cycle Length: 120							
Offset: 39 (33%), Referenced to pha	ase 6·WBT S	Start of Gree	'n				
Natural Cycle: 110	130 0. WD1, 0		/11				
Control Type: Actuated-Coordinated	4						
Maximum v/c Ratio: 1.06	1						
Intersection Signal Delay: 57.4				In	ersection L	UC' E	
Intersection Capacity Utilization 110	10/				U Level of S		
Analysis Period (min) 15	J. I 70			IC	U Level OF 3		
 Volume exceeds capacity, queu 	o is theoretic	ally infinita					
		any minine.					
Queue shown is maximum after			lannar				
# 95th percentile volume exceeds		eue may be	ionger.				
Queue shown is maximum after	two cycles.						
Splits and Phases: 4: Kirkwood &	Carling M/D						
-	Carning WB						1.
√ Ø1							М Ø3
74 s							13 s

√ Ø1	Ø 3	🌵 Ø4
74 s	13 s	33 s
, ← Ø6 (R)	≜ 1 Ø8	
74 s	46 s	