# 30-48 Chamberlain Avenue

## **Transportation Impact Assessment**

Step 1 Screening Report

Step 2 Scoping Report

Step 3 Forecasting Report

Step 4 Strategy Report - ZBA

Step 4 Strategy Report – SPA (revision #1)

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## 1 Screening

This study has been prepared according to the City of Ottawa's 2017 Transportation Impact Assessment (TIA) Guidelines. Accordingly, a Step 1 Screening Form has been prepared and is included as Appendix A, along with the Certification Form for TIA Study PM. As shown in the Screening Form, a TIA is required including the Design Review component and the Network Impact Component. This updated report supports a site plan application.

## 2 Existing and Planned Conditions

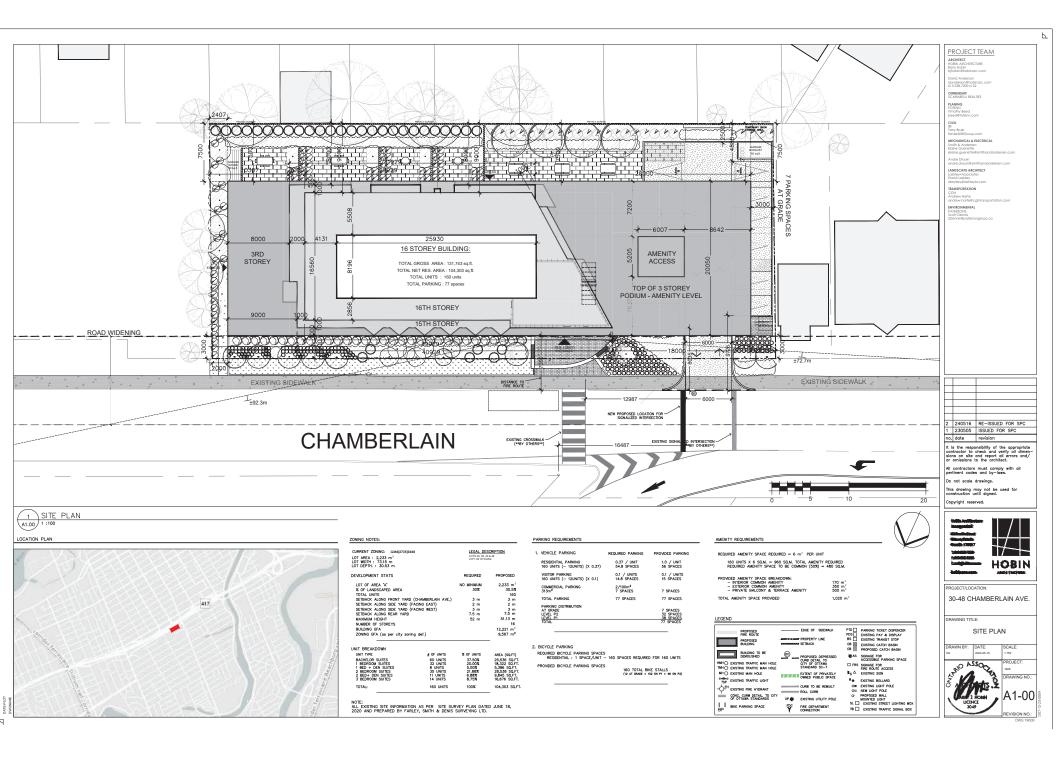
### 2.1 Proposed Development

The proposed development, located at 30-48 Chamberlain Avenue and zoned as General Mixed-Use (GM4[2735]S448), is planned to include a total of 160 apartment units, and approximately 3,370 sq ft of ground floor retail space. The proposed vehicle parking consists of 77 spaces. The existing site contains a dental clinic and an electrician's office, including approximately 54 parking stalls, both defined and undefined on a paved surface lot. The site will be accessed by a 6.0-metre right-in/right-out access west of a proposed relocation of the stop bar for the half signal serving the crosswalk. The anticipated full build-out and occupancy horizon is 2024. Figure 1 illustrates the Study Area Context. Figure 2 illustrates the proposed concept plan.



Source: http://maps.ottawa.ca/geoOttawa/ Accessed: January 19, 2023





### 2.2 Existing Conditions

### 2.2.1 Area Road Network

*Bank Street:* Bank Street is a City of Ottawa arterial road with a four-lane urban cross-section, sidewalks on both sides of the road, and on-street parking permitted on the east side of the road south of Pretoria Avenue and on both sides of the road south of Strathcona Avenue (no stopping peak hours in peak directions). The posted speed limit transitions at Chamberlain Avenue/Isabella Street from 40km/h to the south, to 50km/h to the north. The City-protected right-of-way is 20.0 metres and Bank Street is a truck route.

*Kent Street:* Kent Street is a City of Ottawa one-way arterial road (northbound) with a three-lane urban crosssection, sidewalks on both sides of the road, and on-street parking permitted on the east side south of Arlington Avenue in a layby and on the west side in laybys and on the east side in the travel lane (no stopping during AM peak) north of Flora Street. The unposted speed limit is 50 km/h and the City-protected right-of-way is 20.0 metres. Kent Street is a truck route.

*Lyon Street:* Lyon Street is a City of Ottawa one-way arterial road (southbound) with a two-lane urban crosssection, sidewalks on both sides of the road, a bike lane on the west side of the road, and on-street parking permitted on the east side north of Arlington Avenue in the travel lane (no stopping during PM peak). The unposted speed limit is 50 km/h and the City-protected right-of-way is 20.0 metres.

*Catherine Street:* Catherine Street is a City of Ottawa arterial road with a three-lane urban cross-section, sidewalks on both sides of the road, and on-street parking permitted on the north side of the road west of Lyon Street. The posted speed limit is 50 km/h and the City-protected right-of-way is 23.0 metres. Catherine Street is a truck route.

*Chamberlain Avenue:* Chamberlain Avenue is a City of Ottawa arterial road with a two-lane urban cross section, and a bike lane and sidewalk on the south side of the road. The posted speed limit is 50 km/h and the City-protected right-of-way is 23.0 metres. Chamberlain Avenue is a truck route.

Isabella Street: Isabella Street is a City of Ottawa arterial road with a two-lane urban cross section, and a bike lane and sidewalk on the south side of the road. The posted speed limit is 50 km/h and the City-protected right-of-way is 23.0 metres. Isabella Street is a truck route.

### 2.2.2 Existing Intersections

The key existing signalized intersections within 400 metres of the site have been summarized below:

Lyon Street/Highway 417 On-Ramp & Catherine Street	The intersection of Lyon Street and Bank Street is a signalized intersection. The southbound approach consists of a through lane and a right-turn lane, and the westbound approach consists of a shared left-turn/through lane and two through lanes. As both streets are one-way roadways, the west and south legs are inbound only. It is noted that the south leg of the intersection is an on-ramp to westbound Highway 417. No turn restrictions are noted.
Kent Street & Catherine Street	The intersection of Kent Street and Catherine Street is a signalized intersection. The northbound approach consists of a shared left-turn/through lane, a through lane, and an additional through lane separated by a concrete median. The westbound approach consists of a through lane, a shared through/right-turn lane, and a right-turn lane. Northbound left or right turns are prohibited in the east lane and westbound right turns on red are restricted.



*Kent Street & Chamberlain Avenue* The intersection of Kent Street and Chamberlain Avenue is a pedestrian crossing location with a half-signal. The signal only stops eastbound through movements when triggered by a pedestrian crossing. No turn restrictions are noted.

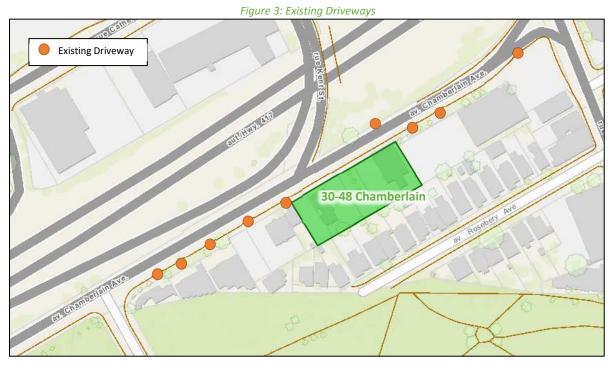
Bank Street & Catherine Street The intersection of Bank Street and Catherine Street is a signalized intersection. The northbound approach consists of a shared left-turn/through lane and a through lane and the southbound approach consists of a through lane and a shared through/right-turn lane. The westbound approach consists of a shared left-turn/through lane, and a shared through/right-turn lane. As Catherine Street is a one-way roadway, the west leg is inbound only. No turn restrictions are noted.

Bank Street & ChamberlainThe intersection of Bank Street and Chamberlain Avenue/Isabella StreetAvenue/Isabella Streetis a signalized intersection. The northbound approach consists of a<br/>through lane and a shared through/right-turn lane, and the southbound<br/>approach consists of a shared left-turn/through lane and a through lane.<br/>The eastbound approach consists of a shared left-turn/through lane, a<br/>through lane, and an auxiliary channelized right-turn lane. Functionally,<br/>driver behaviour results in the southbound approach operating as a left-<br/>turn land and a through lane with drivers shifting to the curb lane in<br/>expectation of vehicles queuing for a left turn. No turn restrictions are<br/>noted.

### 2.2.3 Existing Driveways

Within 200 metres of the proposed site access, eight driveways exist on the south side of Chamberlain Avenue providing access to various commercial land uses. Additionally, a service entrance is present on the north side of Chamberlain Avenue to the east of the proposed site. Figure 3 illustrates the boundary street driveways within 200 metres of the proposed site accesses.





### 2.2.4 Cycling and Pedestrian Facilities

Figure 4 illustrates the pedestrian facilities in the study area and Figure 5 illustrates the cycling facilities.

Sidewalks are provided along the south side of Chamberlain Street, the east side of Kent Street between Catherine Street and Chamberlain Street, and along both sides of all other study area roads. A southbound curbside bike lane is provided on the Lyon Street, which is a spine route (with a northbound bike lane found one block to the west along Bay Street, also a spine route). Catherine Street is a spine route, and Bank Street is a local cycling route.





Source: http://maps.ottawa.ca/geoOttawa/ Accessed: January 19, 2023





Source: http://maps.ottawa.ca/geoOttawa/ Accessed: January 19, 2023



Pedestrian and cyclist volumes included in study area intersection counts, presented in Section 2.2.7, have been compiled and are illustrated in Figure 6 and Figure 7, respectively.

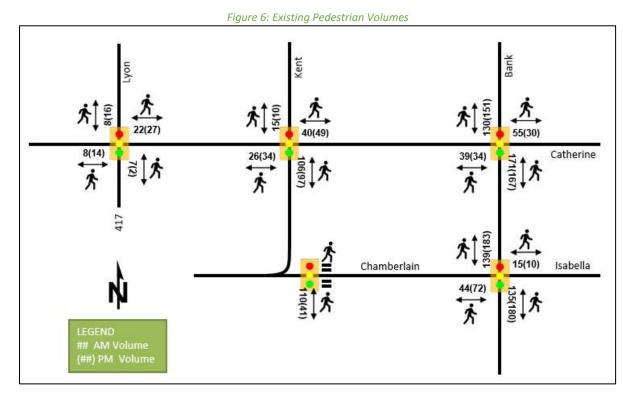
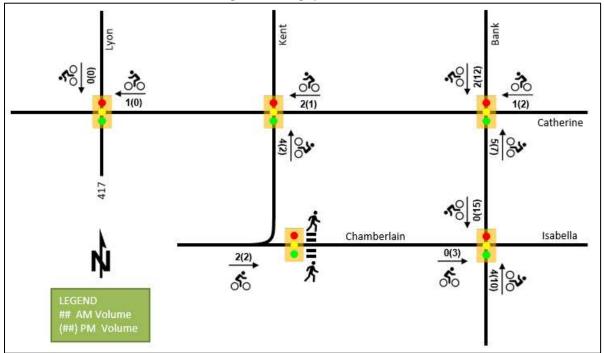


Figure 7: Existing Cyclist Volumes



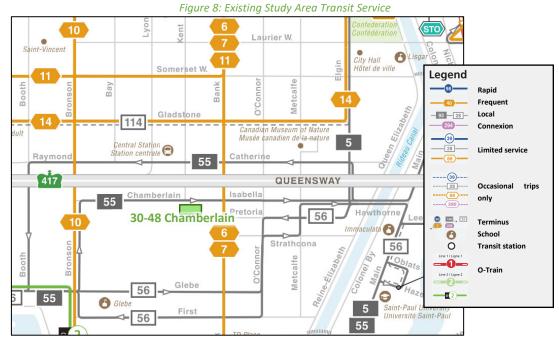


### 2.2.5 Existing Transit

Figure 8 illustrates the transit system map in the study area and Figure 9 illustrates nearby transit stops, including bus stop #6850 is located on the site frontage. All transit information is from March 15, 2023 and is included for general information purposes and context to the surrounding area.

Within the study area, the routes #6 and #7 travel along Bank Street, #55 travels eastbound along Chamberlain Avenue and westbound along Catherine Street. Stops are located at the intersection of Kent Street and Chamberlain Street, and Bank Street and Chamberlain Avenue/Isabella Street. The frequency of these routes within proximity of the proposed site based on March 15, 2023 service levels are:

- Route #6 5-minute service all day, 10-minute nighttime service
- Route #7 15-minute service all day, 30-minute service during the evening/nighttime
- Route #55 15-minute service all day, 30-minute service during the evening



Source: http://www.octranspo.com/ Accessed: March 15, 2023





Source: http://www.octranspo.com/ Accessed: March 15, 2023

### 2.2.6 Existing Area Traffic Management Measures

The study area traffic calming measures consist of narrowings of local roads where they intersect arterials, speed humps along Lyon Street, Flora Street, Arlington Avenue, and on-street parking and bulb-outs/planters to delineate the start and end of the parking areas on local roads and Kent Street.

### 2.2.7 Existing Peak Hour Travel Demand

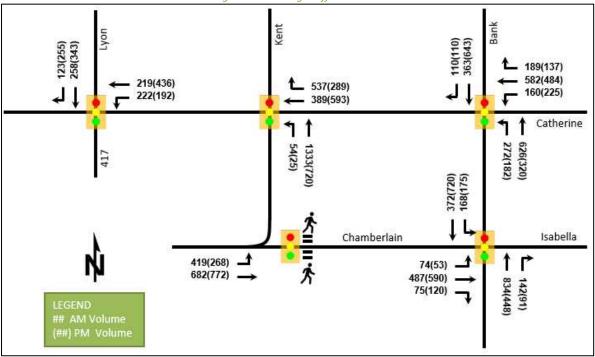
Existing turning movement counts were acquired from City counts for the existing Study Area intersections. Table 1 summarizes the intersection count dates. The counts are all from 2018 and considered acceptable for this area of the City. Typical growth central and downtown Ottawa are limited and it is not expected to have increased in any significant degree since 2018 beyond the application of typical background growth presented in Section 6.

Table 1: Intersection Count Date					
Intersection	Count Date				
Lyon Street/Highway 417 On-Ramp & Catherine Street	Wednesday, April 18, 2018				
Kent Street & Catherine Street	Wednesday, April 18, 2018				
Kent Street & Chamberlain Avenue	Wednesday, April 18, 2018				
Bank Street & Catherine Street	Wednesday, April 18, 2018				
Bank Street & Chamberlain Avenue/Isabella Street	Wednesday, April 18, 2018				

Figure 10 illustrates the existing traffic counts and Table 2 summarizes the existing intersection operations. The level of service for signalized intersections is based on the TIA Guidelines for the lane movements and HCM average delay for the overall intersection. The southbound approach has been modeled as a left-turn lane and a through lane during the AM peak hour at all study horizons, in line with the in-situ operation. Detailed turning movement count data is included in Appendix B and the Synchro worksheets are provided in Appendix C.







#### Table 2: Existing Intersection Operations

Interestica	Lane	AM Peak Hour			PM Peak Hour				
Intersection	Lane	LOS	V/C	Delay	Q (95 <sup>th</sup> )	LOS	V/C	Delay	Q (95 <sup>th</sup> )
Lyon St/Highway	WBL/T	А	0.22	10.0	m25.8	А	0.46	15.4	11.3
417 On-Ramp &	SBT	А	0.42	18.7	47.7	А	0.39	11.0	45.5
Catherine St	SBR	А	0.21	3.9	9.5	А	0.33	6.8	24.7
Signalized	Overall	Α	0.28	11.8	-	Α	0.40	12.4	-
<b>K</b> 1 <b>C</b> 1 <b>O</b>	WBT/R	В	0.69	26.9	m61.0	А	0.51	14.1	m42.9
Kent St &	WBR	С	0.73	31.7	m57.3	А	0.54	16.6	m38.9
Catherine St	NB	С	0.74	19.7	77.9	А	0.49	18.5	40.6
Signalized	Overall	В	0.70	23.2	-	Α	0.48	16.5	-
Kent St &	EBT	А	0.36	7.5	31.6	А	0.31	4.3	36.3
Chamberlain Ave Pedestrian Signal	Overall	Α	0.28	7.5	-	Α	0.32	4.3	-
	WB	D	0.86	33.3	#69.1	D	0.83	33.0	#60.2
Bank St &	NBL/T	E	0.91	18.0	m#34.1	А	0.54	12.0	19.1
Catherine St	SBT/R	В	0.64	26.4	46.7	E	0.92	88.3	#92.8
Signalized	Overall	D	0.86	25.9	-	С	0.74	47.8	-
	EBL/T	С	0.74	30.9	55.7	С	0.76	29.6	62.4
Bank St &	EBR	А	0.19	2.3	3.4	А	0.28	5.3	10.5
Chamberlain Ave	NBT/R	D	0.90	34.6	#122.9	А	0.35	10.2	34.8
/Isabella St	SBL(/T)	А	0.60	27.1	m31.4	6	0.70	26.0	
Signalized	(SBT)	А	0.41	9.5	m28.4	С	0.79	26.8	m92.5
	Overall	С	0.80	27.6		D	0.87	22.4	_

Queue is measured in metres Peak Hour Factor = 0.90

m = metered queue

# = volume for the 95th %ile cycle exceeds capacity

The existing intersections operate adequately during both peak hours.



At the intersection of Bank Street and Catherine Street during the AM peak hour the westbound movement and northbound shared left-turn/through movement may exhibit extended queues. During the PM peak hour at this intersection, the southbound through/right movement may be subject to high delays and extended queues, and the westbound movement may exhibit extended queues.

At the intersection of Bank Street at Chamberlain Avenue/Isabella Street during the AM peak hour, the northbound through/right movement may exhibit extended queues.

### 2.2.8 Collision Analysis

Collision data have been acquired from the City of Ottawa open data website (data.ottawa.ca) for five years prior to the commencement of this TIA for the surrounding study are road network. Table 3 summarizes the collisions types and conditions in the study area, Figure 11 illustrates the intersections and segments analyzed, and Table 4 summarizes the total collisions for each of these locations. Collision data is included in Appendix D.

	,	Number	%
То	Total Collisions		100%
	Fatality	0	0%
Classification	Non-Fatal Injury	10	16%
	Property Damage Only	52	84%
	Angle	17	27%
	Rear end	15	24%
Initial Impact	Sideswipe	19	31%
Туре	Turning Movement	8	13%
	SMV Other	3	5%
	Dry	48	77%
Deed Curfees	Wet	9	15%
Road Surface Condition	Loose Snow	3	5%
condition	Slush	1	2%
	Packed Snow	1	2%
Pedestrian Involv	red	1	2%
<b>Cyclists Involved</b>		1	2%

Table 3: Study Area Collision Summary, 2016-2020



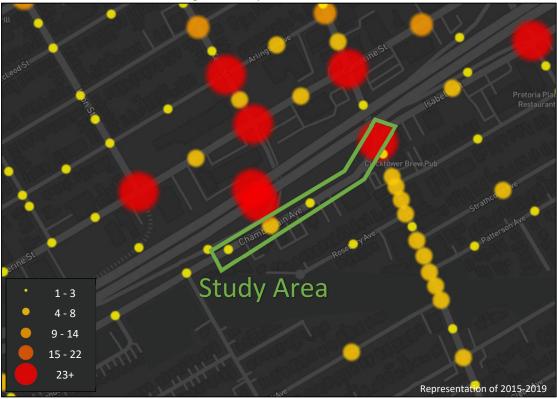


Figure 11: Study Area Collision Records

Table 4: Summary of Collision Locations, 2016-2020

	Number	%
Intersections / Segments	62	100%
Bank Street at Chamberlain Avenue N/Isabella Street	54	87%
Chamberlain Avenue at Kent Street	3	5%
Chamberlain Avenue btwn Kent Street & Bank Street	3	5%
Chamberlain Avenue btwn Lyon Street S & Kent Street	2	3%

Within the study area, the intersection of Bank Street at Chamberlain Avenue/Isabella is noted to show higher collision incidences relative to other area locations. Table 5 summarize the collision types and conditions for the Bank Street at Chamberlain Avenue/Isabella Street intersection.

		Number	%
Тс	otal Collisions	54	100%
	Fatality	0	0%
Classification	Non-Fatal Injury	9	17%
	Property Damage Only	45	83%
	Angle	17	31%
Initial Impact	Rear end	13	24%
Initial Impact Type	Sideswipe	15	28%
	Turning Movement	8	15%
	SMV Other	1	2%
Road Surface	Dry	42	78%
Condition	Wet	8	15%
condition	Loose Snow	2	4%



		Number	%
Total Collisions		54	100%
	Slush	1	2%
	Packed Snow	1	2%
Pedestrian Involve	Pedestrian Involved		2%
Cyclists Involved		1	2%

The intersection of Bank Street and Chamberlain Avenue/Isabella Street had a total of 54 collisions during the 2016-2020 time period, with 45 involving property damage only, and the remaining nine having non-fatal injuries. The collision types are most represented by angle, with 17 collisions, followed by sideswipe with 15 collisions, rear end with 13, turning movement with eight, and SMV (other) with one.

Historically at this intersection, angle collisions have been primarily represented by southbound through vehicles failing to comply with traffic control colliding with eastbound through vehicles. The lagging left-turn phase in the southbound direction may contribute to this trend as drivers are habituated to continue to drive through after the protected left-turn phase terminates. Sideswipe collisions may partially be a result of southbound traffic switching lanes to get around left-turning vehicles in queue and have historically been mostly due to eastbound drivers making improper lane changes possibly due to the skewed crossing of Bank Street. Turning movement collisions have historically been due to the eastbound drivers turning left into eastbound drivers continuing through. Overall, it is recommended that the City explore the possible addition of "chicken tracking" through the intersection to ensure proper lane use and potentially reduce collisions in the eastbound direction.

Weather conditions do not impact collisions at this location and no mitigation or further review of collisions is required as part of this study.

### 2.3 Planned Conditions

### 2.3.1 Changes to the Area Transportation Network

No roadway improvements are included within the Ottawa TMP for the study area road network. Isolated transit priority measures are identified as part of the Affordable Network along Bank Street.

The Chamberlain Avenue, Catherine Street, and Isabella Street Functional Design Study, conducted in 2019, is currently planned for implementation. The plan recommends several improvements on the subject streets including:

- Wider sidewalks and boulevards where feasible
- Cycling connections between the Rideau Canal and the O'Connor Bikeway
- Increased pedestrian queueing area at traffic signals
- Transit priority lane on part of Catherine Street
- Narrower vehicle lane widths
- Reduction in the number of vehicle lanes, where appropriate, including

This Functional Design is currently in the MTO Construction phase through 2027 seeing associated Highway 417 infrastructure under construction, where the design and construction of the plan recommendations will follow. As such, the implementation of these treatments will occur beyond the horizons considered within this TIA.

From the Draft Transportation Master Plan, anticipated for release in 2025, the Glebe Avenue to Percy Street to Chamberlain Avenue, splitting out to Isabella Street, Pretoria Avenue corridor and the O'Connor Street corridor are presently considered for future crosstown bikeways. Also from this draft document, a feasibility study is planned for cycling facilities within the Bank Street corridor south of Highway 417.



### 2.3.2 Other Study Area Developments

### 443-447 Kent Street & 423-425 McLeod Street

The proposed development includes a site plan for a four-storey residential building, with 31 apartment units. This application has been approved. A TIA is not available as part of the submission package for this site.

### 488, 500 Bank Street

The application includes a site plan for a nine-storey mixed use building, which includes 151 residential units and approximately 4350 sq. ft. of ground floor commercial. The development is expected to generate 24 new two-way AM peak hour auto trips and 25 new two-way PM peak hour auto trips (Parsons, 2014).

### 143-153 Arlington Avenue

The application includes a site plan for four-storey residential building, demolishing a previous building, representing a net increase of four units. A TIA is not available as part of the submission package for this site.

### 170 Pretoria Avenue

The application includes a site plan for a four-storey, six-unit residential building. A TIA is not available as part of the submission package for this site.

### 667 Bank Street

The application includes a site plan for a five-storey mixed-use building with 14 residential units, ground floor retail, and eight parking spaces. A TIA is not available as part of the submission package for this site.

## 3 Study Area and Time Periods

### 3.1 Study Area

The study area will include the intersections of:

- Lyon Street/Highway 417 On-Ramp & Catherine Street
- Kent Street at:
  - Catherine Street
  - Chamberlain Avenue (pedestrian signal)
- Bank Street at:
  - Catherine Street
  - Chamberlain Avenue/Isabella Street

The boundary road is Chamberlain Avenue. No screenlines are present near the development site and none will be reviewed as part of this study.

The site access will not be explicitly modeled in the Synchro analysis, as it is to be located west of the proposed relocated stop bar of the half-signal on Chamberlain Avenue. The volumes projected at the site access will be added to the eastbound through volumes at the Kent Street at Chamberlain Avenue intersection.

### 3.2 Time Periods

The weekday AM and PM peak hours will be examined for the proposed development.

### 3.3 Horizon Years

The anticipated build-out year is 2024. As a result, the full build-out plus five years horizon year is 2029.



## 4 Exemption Review

Table 6 summarizes the exemptions for this TIA.

		Table 6: Exemption Review			
Module	Element	Explanation	Exempt/Required		
Design Review Compo	nent				
4.1 Development	4.1.2 Circulation and Access	Only required for site plans	Required		
Design	4.2.3 New Street Networks	Only required for plans of subdivision	Exempt		
	4.2.1 Parking Supply	Only required for site plans	Required		
4.2 Parking	4.2.2 Spillover Parking	Only required for site plans where parking supply is 15% below unconstrained demand	Exempt		
Network Impact Comp	onent				
4.5 Transportation Demand Management	All Elements	Not required for site plans expected to have fewer than 60 employees and/or students on location at any given time	Required		
4.6 Neighbourhood Traffic Management	4.6.1 Adjacent Neighbourhoods	Only required when the development relies on local or collector streets for access and total volumes exceed ATM capacity thresholds	Exempt		
4.8 Network Concept		Only required when proposed development generates more than 200 person-trips during the peak hour in excess of equivalent volume permitted by established zoning	Exempt		

## 5 Development-Generated Travel Demand

### 5.1 Mode Shares

Examining the mode shares recommended in the TRANS Trip Generation Manual (2020) for the subject district, derived from the most recent National Capital Region Origin-Destination survey (OD Survey), the existing average district mode shares by land use for Ottawa Inner Area have been summarized in Table 7.

Travel Mode	Multi-Unit	(High-Rise)	<b>Commercial Generator</b>		
Travel Moue	AM	PM	AM	PM	
Auto Driver	26%	25%	45%	45%	
Auto Passenger	6%	8%	7%	7%	
Transit	28%	21%	29%	29%	
Cycling	5%	6%	8%	8%	
Walking	35%	40%	11%	11%	
Total	100%	100%	100%	100%	

Table 7: TRANS	Trip Generation N	Aanual Recommended	Mode Shares – Ottawa Inner Area

### 5.2 Trip Generation

This TIA has been prepared using the vehicle and person trip rates for the residential dwellings using the TRANS Trip Generation Manual (2020) and the vehicle trip rates and derived person trip rates for the retail component from the ITE Trip Generation Manual 11th Edition (2021) using the City-prescribed conversion factor of 1.28. Table



8 summarizes the person trip rates for the proposed residential land use for each peak period and the person trip rates for the retail land use by peak hour.

Land Use	Land Use Code	Peak	Peak	Period	Peak Hour		
			Vehicle Trip Rate	Person Trip Rates	Vehicle Trip Rate	Person Trip Rates	
Multi-Unit High-Rise	221 & 222	AM	-	0.80	-	-	
	(TRANS)	PM	-	0.90	-	-	
Retail <40k sq. ft.	822	AM	-	-	2.36	3.02	
	(ITE)	PM	-	-	6.59	8.44	

Table 8: Trip Generation Person Trip Rates by Peak Period

Using the above person trip rates, the total person trip generation has been estimated. Table 9 summarizes the total person trip generation for the residential land use and for the retail land use.

_	_	AM Peak Period			PM Peak Period			
Land Use	Units	In	Out	Total	In	Out	Total	
Multi-Unit High-Rise	160	40	88	128	84	60	144	
Land Use	CEA.		AM Peak Hou	r	PM Peak Hour			
	GFA	In	Out	Total	In	Out	Total	
Retail <40k sq. ft.	3,370	6	4	10	14	14	28	

Table 9: Total Residential Person Trip Generation by Peak Period

Internal capture rates from the ITE Trip Generation Handbook 3<sup>rd</sup> Edition have been assigned to the development's retail component for mixed-use developments. The rates summarized in Table 10 represent the percentage of trips to/from the retail use based on the residential component.

#### Table 10: Internal Capture Rates

Land Use	AM		PM	
Land Use	In	Out	In	Out
Residential to/from Shopping Centre	17%	14%	10%	26%

Pass-by reductions applied to the retail trip generation at a rate of 40% have been included using the recommended value presented in the ITE Trip Generation Manual 11th Edition (2021) for the most similar land use with a recommended rate, "Retail (40k - 150k sq. ft.)".

Using the above mode share targets, the internal capture and pass-by rates, and the person trip rates, the person trips by mode have been projected. Trip generation by peak hour has been forecasted using the prescribed peak period conversion factors presented in the TRANS Trip Generation Manual (2020) for the residential component. Table 11 summarizes the residential trip generation and the retail trip generation by mode and peak hour.



		A	M Peak H	lour		PM Peak Hour			
ī	Travel Mode	Mode Share	In	Out	Total	Mode Share	In	Out	Total
	Auto Driver	26%	5	11	16	25%	9	7	16
e) it	Auto Passenger	6%	1	2	3	8%	3	2	5
IJ, ŝŝ	Transit	28%	6	14	20	21%	8	6	14
Multi-Unit (High-Rise)	Cycling	5%	1	2	3	6%	2	2	4
ΣΞ	Walking	35%	8	18	26	40%	18	12	30
	Total	100%	21	47	68	100%	40	29	69
	Auto Driver	45%	0	0	0	45%	0	0	0
ē	Auto Passenger	7%	0	0	0	7%	1	1	2
Shopping Centre	Transit	29%	1	1	2	29%	4	3	7
Ŭ	Cycling	8%	0	0	0	8%	1	1	2
pin	Walking	11%	1	0	1	11%	1	1	2
Ido	Pass-by	40%	-2	-2	-4	40%	-6	-6	-12
Sh	Internal Capture	varies	-1	0	-1	varies	-1	-2	-3
	Total	100%	2	1	3	100%	7	6	13
	Auto Driver	-	5	11	16	-	9	7	16
	Auto Passenger	-	1	2	3	-	4	3	7
tal	Transit	-	7	15	22	-	12	9	21
Total	Cycling	-	1	2	3	-	3	3	6
	Walking	-	9	18	27	-	19	13	32
	Total	-	23	48	71	-	47	35	82

Table 11: Trip Generation by Mode

As shown above, a total of 16 AM and 16 PM new peak hour two-way vehicle trips are projected as a result of the proposed development.

### 5.3 Trip Distribution

To understand the travel patterns of the subject development the OD Survey has been reviewed to determine the travel for the residential component patterns were applied based on the build-out of Ottawa Inner. Table 12 below summarizes the distributions.

Table 12: OD Survey Distribution – Ottawa Inner						
To/From	% of Trips	Via (Outbound/Inbound)				
North	25%	15% Kent St/Lyon St, 5 % Bank St, 5% Metcalfe St/O'Connor St				
South	35%	15% 417 W, 20% Bank St				
East	20%	417 E				
West	20%	417 W				
Total	100%	_				

#### Table 12: OD Cum ou Distribution Ottours I

### 5.4 Trip Assignment

Using the distribution outlined above, turning movement splits, and access to major transportation infrastructure, the trips generated by the site have been assigned to the study area road network. Figure 12 illustrates the new site generated volumes.



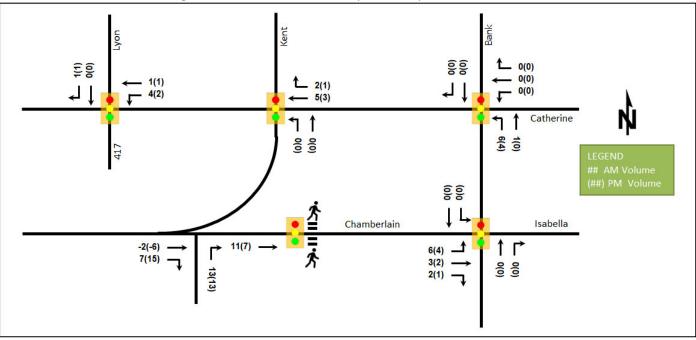


Figure 12: New Site-Generated Primary and Pass-by Auto Volumes

## 6 Background Network Travel Demands

### 6.1 Transportation Network Plans

The transportation network plans were discussed in Section 2.3. No substantial changes are planned for the study area within the study horizons of this TIA.

### 6.2 Background Growth

A review of the background projections from the City's TRANS Regional Model for the 2011 and 2031 horizons was completed to determine the background growth for each of the study area roadways. Table 13 summarizes the results of the model, and the projections are provided in Appendix E.

Table 13: TRANS Regional N	Model Projections – Stu	dy Area Growth Rates			
Street	Direction Growth Percentage				
Street	Eastbound	Westbound			
Catherine (E of Bank)	N/A	-0.04%			
Catherine (W of Bank)	N/A	-0.22%			
Chamberlain	1.43%	N/A			
Isabella	2.16%	N/A			
	Northbound	Southbound			
Lyon	N/A	0.56%			
Hwy 417 Ramp	2.19%	-0.16%			
Kent	0.54%	-			
Bank	-0.02%	0.88%			

In general, the TRANS projections identify a growth rate range of -0.22% and 2.19%. Appropriate growth rates rounded to the nearest 0.25% will be peak-directionally applied to the identified links with negative growth rates being applied at zero. In the case of one-way streets, the peak direction reversal will be applied to the



corresponding opposite-direction one-way street (e.g. the Lyon Street AM growth rate will be applied as the Kent Street PM growth rate). The resultant growth rates applied to the study area roads are summarized in Table 14.

Street	AM Pea	ak Hour	PM Peak Hour		
Street	Eastbound	Westbound	Eastbound	Westbound	
Catherine (E of Bank)	N/A	-	N/A	2.25%	
Catherine (W of Bank)	N/A	-	N/A	1.50%	
Chamberlain	1.50%	N/A	-	N/A	
Isabella	2.25%	N/A	-	N/A	
	Northbound	Southbound	Northbound	Southbound	
Lyon	N/A	0.50%	N/A	0.50%	
Hwy 417 Ramp	N/A	-	N/A	2.25%	
Kent	0.50%	N/A	0.50%	N/A	
Bank	-	1.00%	1.00%	-	

### 6.3 Other Developments

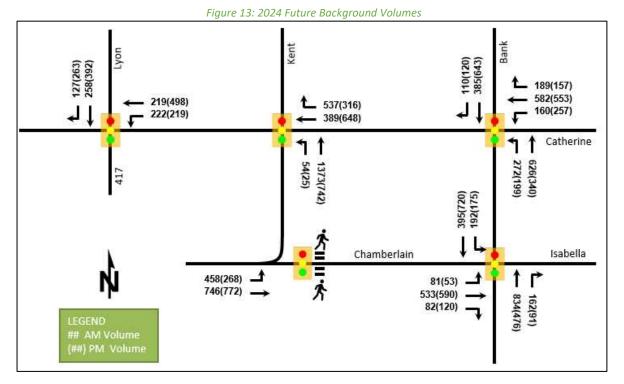
The background developments were discussed in Section 6.2. The 488, 500 Bank Street development's 2014 Transportation Memo concluded that the development-generated traffic would be insignificant and thus it will be assumed to be accounted for by the background traffic growth, along with the other study area developments for which there were no traffic studies.

## 7 Demand Rationalization

### 7.1 2024 Future Background Operations

Figure 13 illustrates the 2024 background volumes and Table 15 summarizes the 2024 background intersection operations. The level of service for signalized intersections is based on v/c calculations for individual lane movements and HCM 2000 v/c calculations for the overall intersection, and average delay for unsignalized intersections. The synchro worksheets for the 2024 future background horizon are provided in Appendix F.





#### Table 15: 2024 Future Background Intersection Operations

Interestica	Lana		AM Pe	ak Hour			PM Pea	ak Hour	
Intersection	Lane	LOS	V/C	Delay	Q (95 <sup>th</sup> )	LOS	V/C	Delay	Q (95 <sup>th</sup> )
Lyon St/Highway	WBL/T	А	0.20	10.5	26.1	А	0.47	16.1	12.0
417 On-Ramp &	SBT	А	0.37	18.1	42.7	А	0.40	11.1	47.0
Catherine St	SBR	А	0.19	3.9	9.2	А	0.31	6.5	22.7
Signalized	Overall	Α	0.25	11.9	-	Α	0.41	12.8	-
Kant Ct 9	WBT/R	В	0.62	26.3	m60.6	А	0.50	14.3	m41.1
Kent St &	WBR	В	0.66	30.1	m57.1	А	0.53	16.6	m37.1
Catherine St Signalized	NB	В	0.69	18.5	69.8	А	0.45	18.0	37.2
Signunzeu	Overall	В	0.64	22.0	-	Α	0.46	16.3	-
Kent St &	EBT	А	0.36	7.5	31.0	А	0.28	4.3	32.2
Chamberlain Ave Pedestrian Signal	Overall	Α	0.27	7.5	-	Α	0.29	4.3	-
Dawle Ch O	WB	С	0.77	28.6	54.9	D	0.85	34.4	#66.1
Bank St &	NBL/T	D	0.81	12.0	m28.8	А	0.53	12.2	18.9
Catherine St Signalized	SBT/R	А	0.60	25.6	43.9	D	0.84	37.4	#80.1
Signunzeu	Overall	С	0.77	21.5	-	С	0.71	30.1	-
	EBL/T	С	0.73	30.7	54.8	С	0.71	29.0	55.3
Bank St &	EBR	А	0.19	2.2	3.3	А	0.26	4.7	8.7
Chamberlain Ave	NBT/R	D	0.82	28.8	#107.6	А	0.32	9.4	32.7
/Isabella St	SBL(/T)	А	0.57	24.6	m33.3	В	0.69	16.2	m99.0
Signalized	(SBT)	А	0.39	9.1	m27.6	В	0.68	16.2	m88.0
	Overall	С	0.75	24.6	-	С	0.77	17.6	-

Notes: Saturation flow rate of 1800 veh/h/lane Queue is measured in metres

Peak Hour Factor = 1.00

Delay = average vehicle delay in seconds m = metered queue

# = volume for the 95th %ile cycle exceeds capacity



During both the AM and PM peak hours, the study area intersections operate well at the 2024 future background conditions with operational improvements from existing at all intersections due to the peak hour factor moving from 0.90 to 1.00 for forecasted conditions. No new capacity issues are noted.

### 7.2 2029 Future Background Operations

Figure 14 illustrates the 2029 background volumes and Table 16 summarizes the 2029 background intersection operations. The level of service for signalized intersections is based on v/c calculations for individual lane movements and HCM 2000 v/c calculations for the overall intersection, and average delay for unsignalized intersections. The synchro worksheets for the 2029 future background horizon are provided in Appendix G.

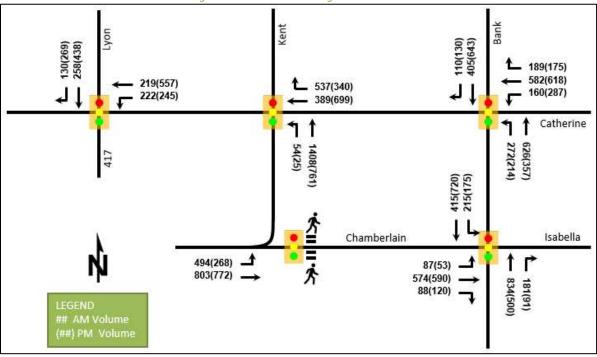


Figure 14: 2029 Future Background Volumes

#### Table 16: 2029 Future Background Intersection Operations

Interception	Lana		AM Pea	ak Hour		PM Peak Hour					
Intersection	Lane	LOS	V/C	Delay	Q (95 <sup>th</sup> )	LOS	V/C	Delay	Q (95 <sup>th</sup> )		
Lyon St/Highway 417 On-Ramp & Catherine St <i>Signalized</i>	WBL/T	А	0.20	10.5	26.1	А	0.53	16.7	15.2		
	SBT	Α	0.37	18.1	42.7	А	0.45	11.8	53.9		
	SBR	А	0.20	3.9	9.3	А	0.32	7.6	25.7		
	Overall	Α	0.25	11.8	-	Α	0.47	13.6	-		
Kout Ct Q	WBT/R	В	0.62	26.2	m60.3	А	0.54	15.4	m40.3		
Kent St & Catherine St	WBR	В	0.66	30.0	m56.8	А	0.57	17.8	m36.9		
Signalized	NB	В	0.70	18.8	72.3	А	0.46	18.2	38.3		
Signunzeu	Overall	В	0.65	22.1	-	Α	0.49	17.0	-		
Kent St &	EBT	Α	0.38	7.5	33.7	А	0.28	4.3	32.2		
Chamberlain Ave Pedestrian Signal	Overall	Α	0.29	7.5	-	Α	0.29	4.3	-		



1			AM Pe	ak Hour		PM Peak Hour					
Intersection	Lane	LOS	V/C	Delay	Q (95 <sup>th</sup> )	LOS	V/C	Delay	Q (95 <sup>th</sup> )		
Bank St & Catherine St Signalized	WB	С	0.77	28.6	54.9	E	0.95	45.5	#79.9		
	NBL/T	D	0.82	12.0	m24.2	А	0.57	12.6	20.0		
	SBT/R	В	0.63	26.4	46.2	D	0.86	39.1	#81.8		
	Overall	С	0.77	21.7	-	С	0.76	35.7	-		
	EBL/T	С	0.76	31.1	59.6	С	0.71	29.0	55.3		
Bank St &	EBR	А	0.19	2.5	4.2	А	0.26	4.7	8.7		
Chamberlain Ave	NBT/R	D	0.86	31.9	#110.8	А	0.33	9.6	34.4		
/Isabella St	SBL(/T)	В	0.66	30.0	m#41.0	<b>D</b>	0.00	107			
Signalized	(SBT)	А	0.42	9.9	m28.6	В	0.69	16.7	m84.2		
	Overall	С	0.80	26.6	-	В	-	17.7	-		
Notes: Saturation flo	w rate of 1800 v	/eh/h/lane			Delay = average vehicle delay in seconds						
Queue is mea	sured in metres				m = metered queue						

Peak Hour Factor = 1.00

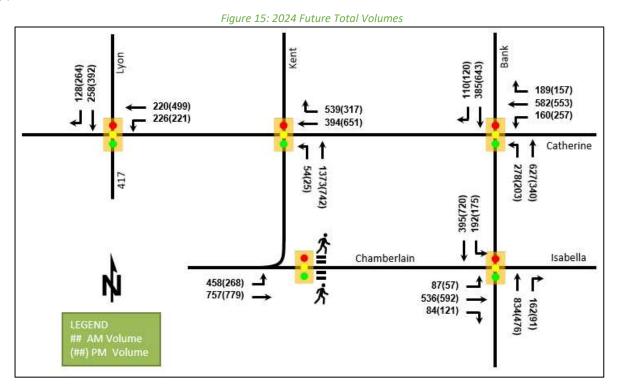
# = volume for the 95th %ile cycle exceeds capacity

During both the AM and PM peak hours, the study area intersections operate well at the 2029 future background conditions and similarly to the 2024 background conditions.

At the intersection of Bank Street at Chamberlain Avenue/Isabella Street, the southbound left lane may exhibit extended queues.

### 7.3 2024 Future Total Operations

Figure 15 illustrates the 2024 total volumes and Table 17 summarizes the 2024 total intersection operations. The level of service for signalized intersections is based on v/c calculations for individual lane movements and HCM 2000 v/c calculations for the overall intersection The synchro worksheets for the 2024 total horizon are provided in Appendix H.





Intersection	Lana		AM Pe	ak Hour			PM Pe	ak Hour	
Intersection	Lane	LOS	V/C	Delay	Q (95 <sup>th</sup> )	LOS	V/C	Delay	Q (95 <sup>th</sup> )
Lyon St/Highway	WBL/T	А	0.20	10.5	26.4	А	0.47	16.0	11.9
417 On-Ramp &	SBT	А	0.37	18.1	42.7	А	0.40	11.1	47.0
Catherine St Signalized	SBR	А	0.20	3.9	9.2	А	0.31	6.6	22.8
	Overall	Α	0.25	11.8	-	Α	0.41	12.8	-
Kent St & Catherine St <i>Signalized</i>	WBT/R	В	0.63	26.2	m60.7	А	0.51	14.4	m41.5
	WBR	В	0.66	30.0	m56.8	А	0.53	16.7	m37.4
	NB	В	0.69	18.5	69.8	А	0.45	18.0	37.2
	Overall	В	0.64	22.0	-	Α	0.46	16.4	-
Kent St &	EBT	А	0.36	7.5	31.6	А	0.28	4.3	32.5
Chamberlain Ave Pedestrian Signal	Overall	Α	0.28	7.5	-	Α	0.29	4.3	-
	WB	С	0.77	28.6	54.9	D	0.85	34.4	#66.1
Bank St &	NBL/T	D	0.82	12.3	m29.3	А	0.54	12.2	19.2
Catherine St	SBT/R	А	0.60	25.6	43.9	D	0.84	37.4	#80.1
Signalized	Overall	С	0.77	21.6	-	С	0.71	30.1	-
	EBL/T	С	0.74	30.9	55.7	С	0.72	29.1	55.7
Bank St &	EBR	А	0.19	2.3	3.5	А	0.26	4.7	8.7
Chamberlain Ave	NBT/R	D	0.83	29.0	#107.6	А	0.32	9.5	32.7
/Isabella St	SBL(/T)	А	0.57	24.8	m33.4		0.00	16.2	
Signalized	(SBT)	А	0.39	9.2	m27.6	В	0.69	16.3	m88.0
		С	0.76	24.8		С	0.77	17.7	

Table 17: 2024 Future Total Intersection Operations

ueue is measured in metres Peak Hour Factor = 1.00

m = metered queue

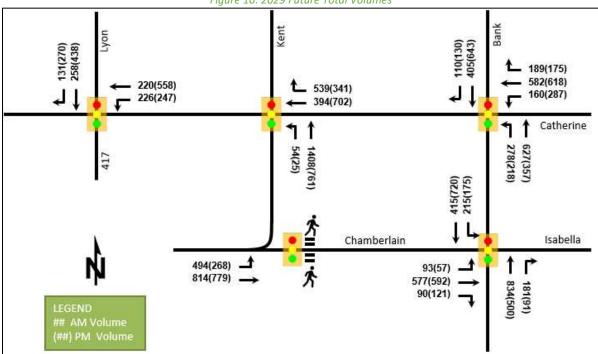
# = volume for the 95th %ile cycle exceeds capacity

The network intersection operations for the 2024 future total horizon operate similarly to the 2024 future background conditions. No capacity issues are noted, and no mitigation measures are required.

### 7.4 2029 Future Total Operations

Figure 16 illustrates the 2029 total volumes and Table 18 summarizes the 2029 total intersection operations. The level of service for signalized intersections is based on v/c calculations for individual lane movements and HCM 2000 v/c calculations for the overall intersection. The synchro worksheets for the 2029 future total horizon are provided in Appendix I.





#### Figure 16: 2029 Future Total Volumes

#### Table 18: 2029 Future Total Intersection Operations

Intercetion	Lana		AM Pea	ak Hour			PM Pea	ak Hour	
Intersection	Lane	LOS	V/C	Delay	Q (95 <sup>th</sup> )	LOS	V/C	Delay	Q (95 <sup>th</sup> )
Lyon St/Highway	WBL/T	А	0.20	10.5	26.4	А	0.53	16.6	15.1
417 On-Ramp &	SBT	А	0.37	18.1	42.7	А	0.45	11.8	53.9
Catherine St	SBR	А	0.20	3.9	9.3	А	0.32	7.6	25.8
Signalized	Overall	Α	0.25	11.8	-	Α	0.47	13.6	-
Kont Ct 9	WBT/R	В	0.63	26.1	m60.7	А	0.55	15.5	m40.7
Kent St & Catherine St <i>Signalized</i>	WBR	В	0.66	29.9	m56.7	А	0.57	17.8	m37.1
	NB	В	0.70	18.8	72.3	А	0.46	18.2	38.3
	Overall	В	0.65	22.1	-	Α	0.49	17.0	-
Kent St &	EBT	А	0.38	7.5	34.2	А	0.28	4.3	32.5
Chamberlain Ave Pedestrian Signal	Overall	Α	0.30	7.5	-	Α	0.29	4.3	-
Dawls Ct. 0	WB	С	0.77	28.6	54.9	Е	0.95	45.5	#79.9
Bank St & Catherine St	NBL/T	D	0.82	12.2	m24.6	А	0.57	12.6	20.3
Signalized	SBT/R	В	0.63	26.4	46.2	D	0.86	39.1	#81.8
Signunzeu	Overall	С	0.78	21.8	-	С	0.76	35.7	-
	EBL/T	С	0.76	31.3	60.6	С	0.72	29.1	55.7
Bank St &	EBR	А	0.20	2.6	4.4	А	0.26	4.7	8.7
Chamberlain Ave	NBT/R	D	0.87	32.3	#110.8	А	0.34	9.6	34.4
/Isabella St	SBL(/T)	В	0.66	30.2	m#41.1	В	0.60	16.7	m01 2
Signalized	(SBT)	А	0.42	9.9	m28.6	В	0.69	16.7	m84.2
	Overall	С	0.80	26.8	-	С	0.78	17.8	-

Notes: Saturation flow rate of 1800 veh/h/lane Queue is measured in metres

Peak Hour Factor = 1.00

Delay = average vehicle delay in seconds m = metered queue

# = volume for the 95th %ile cycle exceeds capacity



The network intersection operations for the 2029 future total horizon operate similarly to the 2029 future background conditions. No capacity issues are noted, and no mitigation measures are required.

### 7.5 Modal Share Sensitivity and Demand Rationalization Conclusions

No capacity issues have been noted at the study area intersections. Given this residual capacity, no rationalization for network demand is required.

With respect to site travel demand, negligible impacts are forecast from the low number of auto trips using the unmodified district mode shares. Thus, no rationalization for site-generated travel is required.

## 8 Development Design

### 8.1 Design for Sustainable Modes

Bicycle parking within secure rooms and auto parking are both located within the underground parking garage, and hard surface connections are provided from the building entrance to existing area pedestrian facilities. Bicycle parking is also provided via surface racks at the rear of the building and surface vehicle parking accesses the drive aisle.

All area transit stops for routes discussed in Section 2.2.5 are within 400 metres walk of the building entrance. The existing bus stop, partially located within the site driveway, is envisioned to shift approximately three metres to the west. Alternatively, the stop may relocate to the east to the far side of the pedestrian signal where no frontage conflicts exist. The site plan can accommodate both options and will be a decision from OC Transpo on their preferred location. Any upgrades to the existing stop facilities will be the responsibility of the City once Catherine Avenue is upgraded to ensure it is completed in a holistic manner consistent with the future detailed design exercise.

The infrastructure TDM checklist is provided in Appendix J.

### 8.2 Circulation and Access

Vehicular and cycling access is provided via a right-in-right-out access onto Chamberlain Avenue, adjacent to the relocated stop bar for the Chamberlain Avenue pedestrian signal. The stop bar is proposed to shift approximately 7.7 metres to the east. Access directly to Kent Street is to be restricted via a No Straight Through sign (Rb-10) located on the private approach.

Emergency and services are anticipated to access the site along the Chamberlain Avenue frontage and garbage collection is anticipated to take place within the drive aisle with the garbage truck entering the site in a forward direction and exiting the site in reverse.

## 9 Parking

### 9.1 Parking Supply

The site proposes 160 bicycle parking spaces including 12 at-grade, 102 on P1, and 46 on P2. The site will also provide 77 vehicle parking spaces in total, with seven vehicle spaces within the surface lot and the remaining 70 spaces underground.

The typical parking requirements from the zoning by-law indicate that 80 bicycle and 55 vehicle spaces are required for tenants, 15 vehicle spaces are required for visitors, and a minimum of seven vehicle spaces are required for the commercial space based upon the assumption of a retail store.



The total vehicle parking requirement of 77 spaces is therefore proposed as being met by the development, and the typical bicycle parking provision is proposed as being exceeded by a factor of two.

## 10 Boundary Street Design

Table 19 summarizes the MMLOS analysis for the boundary street of Chamberlain Avenue. The existing and future conditions for the segment will be considered in separate rows. The boundary street analysis is based on the policy area of "Within 200m of a school". The MMLOS worksheets has been provided in Appendix K.

	Tuble 19.	Boundary.	Street IVIIVI	LUS Anulys	515			
Segment	Pedestr	rian LOS	Bicyc	le LOS	Trans	it LOS	Truck LOS	
	PLOS	Target	BLOS	Target	TLOS	Target	TrLOS	Target
Chamberlain Avenue (Existing)	F	А	E	D	D	D	А	E
Chamberlain Avenue (Future)	D	А	А	D	D	D	А	E

#### Table 19: Boundary Street MMLOS Analysis

Chamberlain Avenue along the site frontage does not meet the pedestrian and cycling MMLOS targets. Pedestrian LOS is not met due to the lack of boulevard, the sidewalk width, and high operating speeds and volumes on the arterial road. If the sidewalk were increased from 1.8 metres to 2.0 metres with a 0.5 metre boulevard or more, the segment would score PLOS D, due to the nature of arterial roads. A curbside bike lane along Chamberlain Avenue currently ends at its intersection with Kent Street, in advance of its intersection with Bank Street where the existing pavement width would preclude its continuation. If the Chamberlain Avenue were widened at its intersection with Bank Street and the bike lane were to be extended, the segment would score BLOS A, however any such treatment would be beyond the scope of this report. Mixed traffic conditions limit transit LOS.

Per the Chamberlain Avenue, Catherine Street and Isabella Street Functional Design Study, the currently planned future conditions for Chamberlain Avenue include a MUP to replace the sidewalk on the south side of the road separated from the road's edge by a 1.5 metre boulevard. This treatment will improve bicycle LOS to a score of A, meeting targets, and improve pedestrian LOS to a score of D, still failing to meet targets. This treatment is due to occur outside of the time horizons considered by this report.

## 11 Access Intersections Design

### 11.1 Location and Design of Access

The proposed site accesses intersect Chamberlain Avenue just east of Kent Street between the stop line of the half-signal, which controls though-movements to permit pedestrian crossings, and its crosswalk.

The right-in/right-out access is proposed as being 6.0 metres-wide and right-in/right-out with a throat length between the back of sidewalk and the first point of conflict of 8.0 metres and a distance between the roadway edge and first point of conflict of 9.7 metres. In the ultimate conditions with the proposed Chamberlain Avenue, Catherine Street, and Isabella Street Functional Design Study geometry, the throat length is anticipated to increase.

The clear throat length for the access is below the suggested minimum value from Table 8.9.3 of the Geometric Design Guide for Canadian Roadways (Transportation Association of Canada (TAC), 2017) for a residential development of between 100-200 units accessing an arterial road. It is notable that the parcel is only 30.6 metres deep, and the referenced suggestion could not be met in any condition given required setbacks and aisle widths. Additionally, the existing properties includes three two-way accesses on Chamberlain Avenue, each with no clear throat length. Ultimately, during the PM peak hour when the highest number of trips are forecast, the inbound trips are anticipated to be 15 vehicles and outbound trips are anticipated to be 13 vehicles. These volumes average



out to one vehicle entering or exiting every four-to-five minutes. Overall, spillback is not anticipated from the site, space is provided for a vehicle to queue within the driveway without conflict.

No visibility issues are present at the site access, with clear lines of sight from the access to the oncoming eastbound traffic and the pedestrian crossing.

### 11.2 Intersection Control

Given the accesses are private approach driveways, minor stop control is proposed on each site access approach. Additionally, No Straight Through signs (Rb-10) are proposed at each private approach to restricted movements through onto Kent Street.

### 11.3 Access Intersection Design

### 11.3.1 2024 & 2029 Future Total Access Intersection Operations

The access intersection is anticipated to operate well at both future horizons being right-in/right-out and having 15 or fewer forecasted inbound or outbound movement during a peak hour. No further analysis is required.

### 11.3.2 Access Intersection MMLOS

Table 20 summarizes the MMLOS analysis for the site access intersection of Kent Street and Chamberlain Avenue. The existing and future scores for the access intersection will be the same and both horizons are considered in one row. The intersection analysis is based on the policy area of "Within 200m of a school". The MMLOS worksheets has been provided in Appendix K.

Tuble 20: Access Intersection MMLOS Analysis													
Intersection	Pedestrian LOS		Bicycle LOS		Transit LOS		Truck LOS		Auto LOS				
	PLOS	Target	BLOS	Target	TLOS	Target	TkLOS	Target	ALOS	Target			
Kent Street & Chamberlain Avenue (Existing/Future)	A	A	E	D	В	D	_	-	A	E			

Table 20: Access Intersection MMLOS Analysis

Given the nominal intersection is controlled by a half-signal facilitating the pedestrian crossing of the two-lane arterial, the intersection scores a PLOS of A. Bicycle LOS was limited by the left-turn approach where cyclists are required to cross two lanes to merge into the exiting left-turn lane. No standard left-turn treatments would be applicable at this intersection due to its geometric and functional characteristics.

### 11.3.3 Recommended Design Elements

The private approach driveways will require a depressed curb and sidewalk through the accesses, the relocation of the existing bus stop, and reinstatement of any accesses removed to full curb height.

## 12 Transportation Demand Management

### 12.1 Context for TDM

The existing area modal shares have been applied without modification, with the district of Ottawa Inner already relying heavily on active modes and transit. As such, modal shares are likely to be achieved. However additional TDM measures could be employed to help ensure this outcome, and to support a further shift from auto mode selection.

Total bedrooms across the 150 proposed units within the development is subject to the final unit count and layout selections by purchasers. No age restrictions are noted.



### 12.2 Need and Opportunity

As stated previously, existing area modal shares have been applied to site generated trips, and therefore, modal share targets should be achieved. Additionally, given the capacity of the study area intersections, deviation from target modal shares will not unduly impact network operations.

### 12.3 TDM Program

The "suite of post occupancy TDM measures" has been summarized in the TDM checklists for the residential land uses. The checklist is provided in Appendix J. The key TDM measures recommended include:

- Display relevant transit schedules and route maps at entrances
- Provide a multimodal travel option information package to new employees/residents
- Inclusion of a 1-month Presto card for first time new townhome purchase and apartment rental, with a set time frame for this offer (e.g. 6-months) from the initial opening of the site
- Unbundle parking cost from purchase or rental costs

## 13 Transit

### 13.1 Route Capacity

In Section 5.1 the trip generation by mode was estimated, including an estimate of the number of transit trips that will be generated by the proposed development. Table 21 summarizes the transit trip generation.

Table 24. Tria Concention by Transit Made

Table 21: Trip Generation by Transit Mode											
Travel Mode	Mada Chava	AN	1 Peak Ho	our	PM Peak Hour						
	Mode Share	In	Out	Total	In	Out	Total				
Transit	varies	7	15	22	12	9	21				

The proposed development is anticipated to generate an additional 22 two-way AM peak hour transit trips and 21 two-way PM peak hour transit trips. From the trip distribution found in section 5.2, these values can be further broken down. Table 22 summarizes forecasted site-generated transit ridership trips by direction, the routes that are impacted, and the equivalent bus loads.

Direction	AM Pea	ak Hour	PM Pe	ak Hour	Service Type	Approximate Equivalent Peak							
	In	Out	In	Out	Service Type	Hour/Direction Bus Loads							
North	2	4	3	2	Bus	Negligible							
South	2	5	4	3	Bus	Negligible							
East	1	3	2	2	Bus	Negligible							
West	1	3	2	2	Bus	Negligible							

Table 22: Forecasted Site-Generated Transit Ridership

### 13.2 Transit Priority

Negligible impacts on area transit are forecast due to site-generated vehicle traffic or site-generated transit ridership. No change in transit LOS is forecast on any approach between the future background and the future total conditions.

## 14 Network Intersection Design

### 14.1 Network Intersection Control

No change to the existing signalized control is recommended for the network intersections.



### 14.2 Network Intersection Design

### 14.2.1 Future Total Network Intersection Operations

The operations are noted in Section 7.4 and the network intersections at both the 2024 and 2029 future total are anticipated to operate similarly to the background conditions. Negligible impacts from site auto volumes are anticipated.

### 14.2.2 Network Intersection MMLOS

Table 23 summarizes the MMLOS analysis for the network intersections of Lyon Street/Highway 417 On-Ramp at Catherine Street, Kent Street at Catherine Street, Bank Street at Catherine Street, and Bank Street at Chamberlain Avenue/Isabella Street. The future conditions include the improvements from the Chamberlain Avenue, Catherine Street and Isabella Street Functional Design Study and where the intersections score differently from the existing conditions, they are considered in separate rows. The intersection analysis is based on the policy area of "Within 300m of a school". The MMLOS worksheets have been provided in Appendix K.

		Pedest	rian LOS	Bicyc	le LOS	Trans	it LOS	Trucl	< LOS	Auto	LOS
Intersection		PLOS	Target	BLOS	Target	TLOS	Target	TkLOS	Target	ALOS	Targ et
Lyon St &	Ex.	В	А	А	D	С	D	-	-	А	E
Catherine St	Fut.	Α	Α	А	D	С	D	-	-	А	E
Kent St &	Ex.	D	А	F	D	D	D	D	D	В	E
Catherine St	Fut.	В	Α	F	D	D	D	D	D	В	E
Kent St &	Ex.	Α	Α	F	D	В	D	-	-	А	E
Chamberlain Ave	Fut.	А	Α	E	D	В	D	-	-	А	E
Bank St &	Ex.	С	Α	E	В	F	D	D	D	D	E
Catherine St	Fut.	С	Α	E	В	F	D	D	D	С	E
Bank St &	Ex.	С	Α	D	В	E	D	D	D	D	E
Chamberlain Ave/ Isabella St	Fut.	С	А	В	В	E	D	D	D	С	E

Table 23: Study Area Intersection MMLOS Analysis

The MMLOS targets will only be met for pedestrian LOS at Kent Street at Chamberlain Avenue for both the existing and future upgrade conditions and at Lyon Street at Catherine Street once the future upgrades are complete. The bicycle LOS targets will only be met at the intersections of Lyon Street at Catherine Street for both the existing and future upgrade conditions, and Bank Street at Chamberlain Avenue/Isabella Street once future upgrades are in place. Transit LOS targets will not be met at the intersection of Bank Street at Catherine Street and Bank Street and Chamberlain Avenue/Isabella Street and Bank Street for both the existing and Chamberlain Avenue/Isabella Street for both the existing and Chamberlain Avenue/Isabella Street for both the existing and future upgrade conditions.

Given the functional design study, the ultimate pedestrian and bicycle LOS at the study area intersections are assumed to be in line with City objectives and balancing of objectives to achieve the overall MMLOS goals of the area. To meet transit LOS, all movements associated with transit routes would require a delay of less than 30 seconds. No changes to network intersections are proposed as part of this study.

### 14.2.3 Recommended Design Elements

No study area intersection design elements are proposed as part of this study.

## 15 Summary of Improvements Indicated and Modifications Options

The following summarizes the analysis and results presented in this TIA report:

### Proposed Site and Screening



- The proposed site includes 160 apartment units and 3,370 sq. ft. of ground floor retail
- A two-way access will be provided onto Chamberlain Avenue
- The development is proposed to be completed as a single phase by 2024
- The Trip Generation, Location, and Safety triggers were met for the TIA Screening
- This report supports a site plan application

### **Existing Conditions**

- Bank Street, Kent Street, Lyon Street, Catherine Street, Chamberlain Avenue, and Isabella Street are arterial roads in the study area
- Sidewalks are generally provided on both sides of the study area roadways, and on-street bike lanes on Lyon Street and Chamberlain Avenue until Kent Street, Lyon Street and Catherine Street are spine routes, and Bank Street is a local route
- The high volumes roadways have produced a high number of collisions at the study area intersections, primarily at the Bank Street at Chamberlain Avenue/Isabella Street intersection
- The collisions are predominantly angled and sideswipe collisions and have historically been the result of failure to comply with traffic control for angled collisions, and improper lane changes for sideswipe collisions
- Some extended queuing is noted in the peak north-south direction at the Bank Street and Catherine Street intersection in the AM peak hour and Bank Street and Chamberlain Avenue intersection in the PM peak hour, but generally the intersections operate adequately

### **Development Generated Travel Demand**

- The proposed development is forecasted produce 71 two-way people trips during the AM peak hour and 82 two-way people trips during the PM peak hour
- Of the forecasted people trips, 16 two-way trips will be vehicle trips during the AM peak hour and 16 twoway trips will be vehicle trips during the PM peak hour based on a 25-26% residential auto mode share target
- Of the forecasted trips, 25% are anticipated to travel north, 35% to travel south, and 20% to travel each east and west

### **Background Conditions**

- No background developments were explicitly included in the background conditions due to insignificant traffic generation, and volumes were grown along mainline and major turning movements commensurate with growth shown on the appropriate links from the TRANS model projections
- The operations at all study area intersections are expected to be similar to the existing conditions at both future background horizons

### **Development Design**

- Parking for bicycles and autos are each proposed within an underground garage, with limited spaces also present on the surface
- Pedestrian connections will be made from the building entrance to the sidewalk along the site frontage via a hard surface treatment and all area transit routes are within 400 m walk of the building entrance
- A bus stop on the site frontage is recommended to be relocated approximately 3 metres to the west



- Access to Kent Street at the right-in/right-out site access is proposed to have the through movement restricted via signage
- Garbage collection is anticipated via the site drive aisle with the garbage truck entering in a forward manner and exiting in a reverse manner, and emergency services are anticipated to access the site via the public road frontage

### Parking

- The proposed vehicle parking provision is 77 spaces, and the proposed bicycle parking provision is 160 spaces
- The typical minimum parking provision from the zoning by-law for the site is 77 vehicle spaces and 80 bicycle spaces, and these minimums are each being met

### Boundary Street Design

- The boundary street does not currently meet pedestrian MMLOS targets due to sidewalk and boulevard widths along Chamberlain Avenue as well as auto volumes and posted speed limits
- Bicycle MMLOS does not currently meet targets due to the termination of the curbside bike lane on Chamberlain Avenue at Kent Street due to current limitations from downstream roadway constriction
- Improvements from the Chamberlain Avenue, Catherine Street and Isabella Street Functional Design Study will not meet pedestrian LOS target but will meet bicycle LOS

### **Access Intersections Design**

- A two-way right-in/right-out access is proposed on the west side of the relocated pedestrian signal stop bar at the pedestrian signal on Chamberlain Avenue
- The access is assumed to be stop controlled on its approach
- The access is considered to have adequate throat length with spillback not anticipated onto Chamberlain Avenue
- Intersection operations at the site access are anticipated to perform well given the low volumes and rightin/right-out operation
- The bicycle LOS targets cannot be met at the site access intersection due to the left-turn mixed traffic configuration requiring two lanes to be crossed at urban traffic speeds

### TDM

- Supportive TDM measures to be included within the proposed development should include:
  - Display relevant transit schedules and route maps at entrances
  - Provide a multimodal travel option information package to new employees/residents
  - Inclusion of a 1-month Presto card for first time new townhome purchase and apartment rental, with a set time frame for this offer (e.g. 6-months) from the initial opening of the site
  - Unbundle parking cost from purchase or rental costs

### Transit

• Negligible impacts are forecast on the area transit routes from site-generated ridership increases or sitegenerated auto traffic delays



### **Network Intersection Design**

- Generally, the network intersections at both future total horizons will operate similarly to the network intersections at the future background horizons
- Pedestrian LOS targets will only be met at Kent Street at Chamberlain Avenue for both the existing and future upgrade conditions and at Lyon Street at Catherine Street once the future upgrades are complete
- Bicycle LOS targets will only be met at the intersections of Lyon Street at Catherine Street for both the existing and future upgrade conditions, and Bank Street at Chamberlain Avenue/Isabella Street once future upgrades are in place
- Transit LOS targets will not be met at the intersection of Bank Street at Catherine Street and Bank Street and Chamberlain Avenue/Isabella Street for both the existing and future upgrade conditions
- Given the functional design study for the network intersections, it is assumed that the future conditions will mee the City's desired balance of MMLOS trade-offs

## 16 Conclusion

It is recommended that, from a transportation perspective, the proposed development application proceed.

Prepared By:

Reviewed By:

ysly

John Kingsley Transportation Engineering-Intern



Andrew Harte, P.Eng. Senior Transportation Engineer



# Appendix A

TIA Screening Form and PM Certification Form





City of Ottawa 2017 TIA Guidelines	Date:	29-Apr-20
Step 1 - Screening Form	Project Number:	2020-40
	Project Reference:	30-48 Chamberlain Avenue

1.1 Description of Proposed Development	
Municipal Address	30-48 Chamberlain Avenue
Description of Location	Existing medical and business buildings,
Description of Location	predominantly parking lot area (>60% of surface)
Land Use Classification	General Mixed-Use - GM4
Development Size	148 residential units, 4,184 sq.ft.
Development Size	commercial/resident, 96 parking spaces
Accesses	Two access loop, existing locations
Phase of Development	Single phase
Buildout Year	2024
TIA Requirement	Full TIA Required

1.2 Trip Generation Trigger	
Land Use Type	Townhomes or apartments
Development Size	148 Units
Trip Generation Trigger	Yes

1.3 Location Triggers	
Does the development propose a new driveway to a boundary street that is	
designated as part of the City's Transit Priority, Rapid Transit or Spine	No
Bicycle Networks?	
Is the development in a Design Priority Area (DPA) or Transit-oriented	Νο
Development (TOD) zone?	NO
Location Trigger	No

1.4. Safety Triggers		
Are posted speed limits on a boundary street 80 km/hr or greater?	No	
Are there any horizontal/vertical curvatures on a boundary street limits	No	
sight lines at a proposed driveway?	NO	
Is the proposed driveway within the area of influence of an adjacent traffic signal or roundabout (i.e. within 300 m of intersection in rural conditions, or within 150 m of intersection in urban/ suburban conditions)?	Yes	
Is the proposed driveway within auxiliary lanes of an intersection?	No	
Does the proposed driveway make use of an existing median break that serves an existing site?	No	
la thora is a desumented history of traffic an evations or sofaty concerns on		High area collisions noted
Is there is a documented history of traffic operations or safety concerns on	No	along the Bank St and
the boundary streets within 500 m of the development?		Catherine St corridors.
Does the development include a drive-thru facility?	No	
Safety Trigger	Yes	



### TIA Plan Reports

On 14 June 2017, the Council of the City of Ottawa adopted new Transportation Impact Assessment (TIA) Guidelines. In adopting the guidelines, Council established a requirement for those preparing and delivering transportation impact assessments and reports to sign a letter of certification.

Individuals submitting TIA reports will be responsible for all aspects of development-related transportation assessment and reporting, and undertaking such work, in accordance and compliance with the City of Ottawa's Official Plan, the Transportation Master Plan and the Transportation Impact Assessment (2017) Guidelines.

By submitting the attached TIA report (and any associated documents) and signing this document, the individual acknowledges that s/he meets the four criteria listed below.

#### CERTIFICATION

- 1. I have reviewed and have a sound understanding of the objectives, needs and requirements of the City of Ottawa's Official Plan, Transportation Master Plan and the Transportation Impact Assessment (2017) Guidelines;
- 2. I have a sound knowledge of industry standard practice with respect to the preparation of transportation impact assessment reports, including multi modal level of service review;
- 3. I have substantial experience (more than 5 years) in undertaking and delivering transportation impact studies (analysis, reporting and geometric design) with strong background knowledge in transportation planning, engineering or traffic operations; and
- 4. I am either a licensed<sup>1</sup> or registered<sup>2</sup> professional in good standing, whose field of expertise [check  $\sqrt{}$  appropriate field(s)] is either transportation engineering  $\sqrt{}$  or transportation planning  $\Box$ .

<sup>1,2</sup> License of registration body that oversees the profession is required to have a code of conduct and ethics guidelines that will ensure appropriate conduct and representation for transportation planning and/or transportation engineering works.

City Of Ottawa Infrastructure Services and Community Sustainability Planning and Growth Management 110 Laurier Avenue West, 4th fl. Ottawa, ON K1P 1J1 Tel. : 613-580-2424 Fax: 613-560-6006 Ville d'Ottawa Services d'infrastructure et Viabilité des collectivités Urbanisme et Gestion de la croissance 110, avenue Laurier Ouest Ottawa (Ontario) K1P 1J1 Tél.: 613-580-2424 Télécopieur: 613-560-6006 Dated at <u>Ottawa</u> this <u>20</u> day of <u>September</u>, 2018. (City)

Name:

Andrew Harte

(Please Print)

Professional Title:

Professional Engineer

Signature of Individual certifier that s/he meets the above four criteria

<b>Office Contact Information (I</b>	Please Print)
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Address: 13 Markham Avenue

City / Postal Code: Ottawa / K2G 3Z1

Telephone / Extension: (613) 697-3797

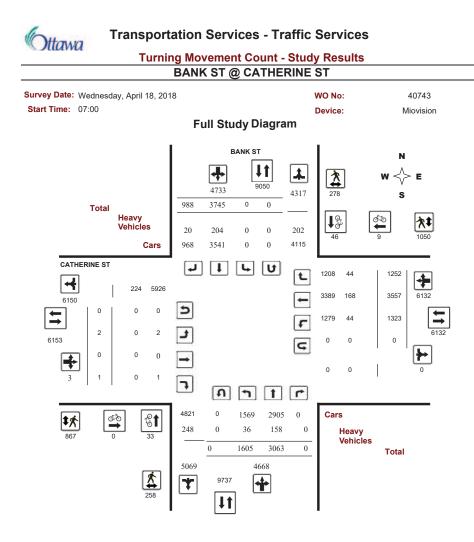
E-Mail Address: Andrew.Harte@CGHTransportation.com





Turning Movement Counts







**Transportation Services - Traffic Services** 

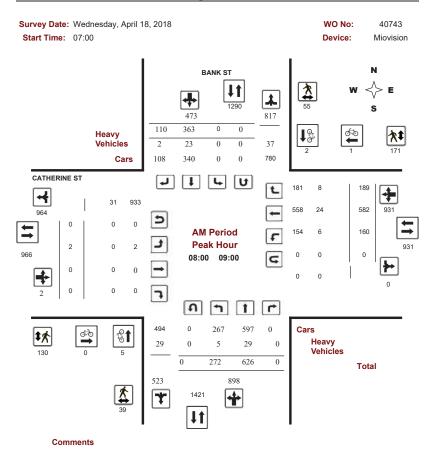
**Turning Movement Count - Study Results** 

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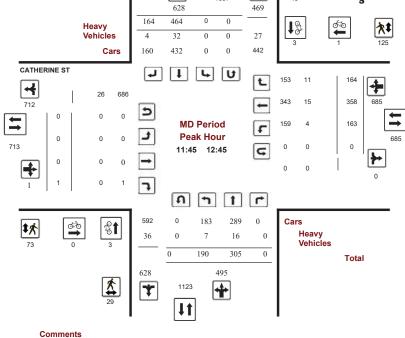


#### Turning Movement Count - Peak Hour Diagram

#### BANK ST @ CATHERINE ST



Ottawa **Transportation Services - Traffic Services Turning Movement Count - Peak Hour Diagram BANK ST @ CATHERINE ST** Survey Date: Wednesday, April 18, 2018 WO No: 40743 Start Time: 07:00 Device: Miovision Ν BANK ST \* <} E l11 w 1 ✦ 1097 48 s



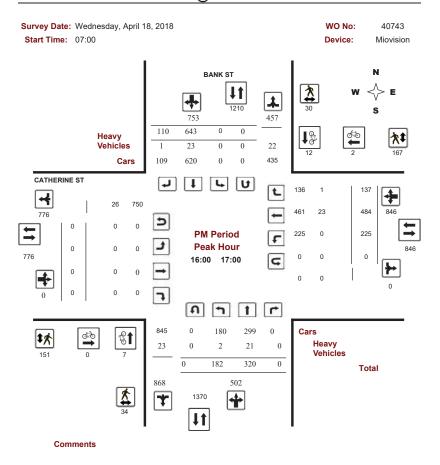
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**Turning Movement Count - Peak Hour Diagram** 

#### BANK ST @ CATHERINE ST



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#### **Transportation Services - Traffic Services**

**Turning Movement Count - Study Results** 

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09:00 10:00	207	341	0	548	0	387	127	514	1062	0	0	0	0	154	441	176	771	771	183
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Note: U-Turns provided for approach totals. Refer to 'U-Turn' Report for specific breakdown.

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	2:15	44	79	0	123	0	121	41	162	285	0	0	0	0	37	77	49	163	163	448
-	2:30	50	69 70	0	119 116	0	136	34 53	170 162	289 278	0	0	1	1	48 29	98 92	31 48	177	178 169	467
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	5:45	34	76	0	110	0	134	27 24	161	271	0	0	0	0	38	146	36 31	220	220	491
	6:00	48 58	73 92	0	121 150	0	145 150	24 28	169 178	290 328	0	0	0	0	45 56	125 144	31	201 232	201 232	491 560
	6:30	44	73	0	117	0	177	32	209	326	0	0	0	0	48	149	31	232	228	554
	6:45	40	75	0	115	0	164	23	187	302	0	0	0	0	52	108	31	191	191	493
16:45 1	7:00	40	80	0	120	0	152	27	179	299	0	0	0	0	69	83	43	195	195	494
_	7:15	40	86	0	126	0	174	31	205	331	0	0	0	0	49	85	37	171	171	502
	7:30	47	90	0	137	0	169	33	202	339	0	0	0	0	59	94	30	183	183	522
	7:45	46 40	71 79	0	117 119	0	148 161	30 25	178 186	295 305	0	0	0	0	54 57	91 78	36 34	181 169	181 169	476 474
17:45 1 Total:	0:00	40 1605	79 3063	0	4668	0	3745	25 988	4733	305 9401	2	0	0	3	57 1323	78 3557	34 1252	6132	169 6135	474

Note: U-Turns are included in Totals.



#### **Transportation Services - Traffic Services**

#### Turning Movement Count - Study Results BANK ST @ CATHERINE ST

	••• Weunesua	y, April 18, 2018	3		WO No:		40743
Start Time	07:00				Device:		Miovision
			Full Study	Cyclist V	olume		
		BANK ST	i un otady	oyonot v	CATHERINE S	т	
Time Period	Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	Grand Total
07:00 07:15	0	1	1	0	0	0	1
07:15 07:30	0	0	0	0	0	0	0
07:30 07:45	2	0	2	0	0	0	2
07:45 08:00	0	1	1	0	0	0	1
08:00 08:15	1	0	1	0	0	0	1
08:15 08:30	0	1	1	0	1	1	2
08:30 08:45	1	0	1	0	0	0	1
08:45 09:00	3	1	4	0	0	0	4
09:00 09:15	0	0	0	0	0	0	0
09:15 09:30	0	1	1	0	0	0	1
09:30 09:45	1	0	1	0	0	0	1
09:45 10:00	0	1	1	0	0	0	1
11:30 11:45	1	1	2	0	0	0	2
11:45 12:00	0	0	0	0	0	0	0
12:00 12:15	2	0	2	0	1	1	3
12:15 12:30	1	3	4	0	0	0	4
12:30 12:45	0	0	0	0	0	0	0
12:45 13:00	0	1	1	0	0	0	1
13:00 13:15	0	1	1	0	0	0	1
13:15 13:30	1	1	2	0	0	0	2
15:00 15:15	1	4	5	0	1	1	6
15:15 15:30	2	3	5	0	2	2	7
15:30 15:45	2	1	3	0	0	0	3
15:45 16:00	2	2	4	0	0	0	4
16:00 16:15	2	4	6	0	1	1	7
16:15 16:30	0	0	0	0	1	1	1
16:30 16:45	3	5	8	0	0	0	8
16:45 17:00	2	3	5	0	0	0	5
17:00 17:15	1	2	3	0	1	1	4
17:15 17:30	1	4	5	0	0	0	5
17:30 17:45	3	4	7	0	1	1	8
17:45 18:00	1	1	2	0	0	0	2

Otton	T	ransportat	ion Sei	rvices - Tra	affic Servic	es	
Juan	<i>u</i>	Turning	Movem	ent Count -	Study Resul	ts	
		B	ANK ST	@ CATHEF	RINE ST		
Survey Date	: Wednesday	v, April 18, 2018			WO No:		40743
Start Time:	07:00				Device:		Miovision
		F	ull Stud	ly Pedestria	n Volume		
		BANK ST		.,	CATHERINE ST		
	NB Approach or W Crossing)	SB Approach (E or W Crossing)	Total	EB Approach (N or S Crossing)	WB Approach (N or S Crossing)	Total	Grand Total
07:00 07:15	3	2	5	7	14	21	26
07:15 07:30	7	6	13	8	18	26	39
07:30 07:45	2	4	6	19	21	40	46
07:45 08:00	5	6	11	23	19	42	53
08:00 08:15	6	8	14	21	38	59	73
08:15 08:30	10	24	34	23	44	67	101
08:30 08:45	13	18	31	53	51	104	135
08:45 09:00	10	5	15	33	38	71	86
09:00 09:15	14	6	20	13	21	34	54
09:15 09:30	4	7	11	12	22	34	45
09:30 09:45	4	13	17	16	16	32	49
09:45 10:00	6	11	17	31	18	49	66
11:45 12:00	6	10	8	11	35	36	44 62
12:00 12:15	7	10	21	24	40	64	85
12:15 12:30	8	14	21	19	15	34	56
12:30 12:45	8	10	18	19	35	54	72
12:45 13:00	12	8	20	23	30	53	73
13:00 13:15	7	4	11	29	32	61	72
13:15 13:30	10	8	18	20	30	50	68
15:00 15:15	6	10	16	20	26	46	62
15:15 15:30	12	18	30	80	28	108	138
15:30 15:45	6	9	15	20	32	52	67
15:45 16:00	6	2	8	21	33	54	62
16:00 16:15	6	4	10	22	33	55	65
16:15 16:30	10	6	16	40	50	90	106
16:30 16:45	9	10	19	36	47	83	102
16:45 17:00	9	10	19	53	37	90	109
17:00 17:15	14	9	23	34	47	81	104
17:15 17:30	14	7	21	41	63	104	125
17:30 17:45	10	13	23	45	54	99	122
17:45 18:00	6	2	8	40	38	78	86
Total	258	278	536	867	1050	1917	2453



#### Turning Movement Count - Study Results BANK ST @ CATHERINE ST

Survey Da	te: M	/edne	esday,	April	18, 20	018							wo	No:			4	0743	
Start Time	<b>e:</b> 0	7:00											Dev	ice:			Mie	ovisior	n
						F	ull S	tud	v He	avy	Veł	nicle	es						
			BA		SТ								HERIN	IE ST					
	N	orthbo	und		Sc	outhbou	nd			F	astbour	hd		We	estbour	hd			
Time Period	LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	Е ТОТ	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00 07:15	1	6	0	16	0	6	1	14	30	0	0	0	11	3	9	1	13	24	27
07:15 07:30	1	7	0	15	0	5	0	12	27	0	0	0	6	2	5	0	7	13	20
07:30 07:45	3	4	0	12	0	4	1	9	21	0	0	0	10	1	6	0	7	17	19
07:45 08:00	0	6	0	12	0	6	0	13	25	0	0	0	5	0	5	1	6	11	18
08:00 08:15	4	3	0	15	0	7	1	15	30	0	0	0	13	1	8	4	13	26	28
08:15 08:30	1	5	0	13	0	6	0	12	25	0	0	0	5	1	4	1	6	11	18
08:30 08:45	0	8	0	17	0	5	1	15	32	0	0	0	8	4	7	1	12	20	26
08:45 09:00	0	13	0	18	0	5	0	20	38	0	0	0	5	0	5	2	7	12	25
09:00 09:15	2	7	0	21	0	9	0	17	38	0	0	0	7	3	5	1	9	16	27
09:15 09:30	5	5	0	21	0	9	3	21	42	0	0	0	13	2	5	4	11	24	33
09:30 09:45	1	6	0	20	0	10	1	19	39	0	0	0	6	3	4	2	9	15	27
09:45 10:00	2	2	0	21	0	13	0	16	37	0	0	0	8	4	6	1	11	19	28
11:30 11:45	0	3	0	14	0	7	1	13	27	0	0	0	6	4	5	2	11	17	22
11:45 12:00	4	4	0	18	0	8	1	14	32	0	0	0	6	2	1	1	4	10	21
12:00 12:15	0	7	0	13	0	5	0	17	30	0	0	0	3	1	3	5	9	12	21
12:15 12:30	3	2	0	19	0	13	1	18	37	0	0	0	11	1	7	2	10	21	29
12:30 12:45	0	3	0	9	0	6	2	14	23	0	0	0	6	0	4	3	7	13	18
12:45 13:00	1	5	0	13	0	4	1	12	25	0	0	0	2	3	0	2	5	7	16
13:00 13:15	3	3	0	13	0	6	1	10	23	0	0	0	7	1	3	0	4	11	17
13:15 13:30	1	5	0	14	0	6	0	13	27	0	0	0	5	2	4	2	8	13	20
15:00 15:15	1	4	0	12	0	5	3	14	26	0	0	0	15	2	11	2	15	30	28
15:15 15:30	1	3	0	13	0	8	1	14	27	0	0	0	11	1	9	2	12	23	25
15:30 15:45	0	2	0	4	0	2	0	5	9	0	0	0	12	0	12	1	13	25	17
15:45 16:00	0	8	0	17	0	8	0	17	34	0	0	0	6	1	6	1	8	14	24
16:00 16:15	0	6	0	10	0	4	0	10	20	0	0	0	9	0	9	0	9	18	19
16:15 16:30	1	5	0	12	0	6	1	13 15	25 31	0	0	0	9	0	7	1	8	17 11	21 21
16:30 16:45	1	6	0	16	0	9	0			0	0	0	-	0	5	0	-		
16:45 17:00 17:00 17:15	0	4	0	8 9	0	4	0	8	16 18	0	0	0	2	0	2	0	2	4	10 13
17:00 17:15		4	0	9	0	5	0	9	18 17	0	-	0	4	2	-		4	8 5	
	0	-	0		0		0		_	0	0	0	1 4	2	1	1	4	5	11
17:30 17:45		7	-	13		6	-	13	26	-	-	-			-			-	
17:45 18:00 Total: None	0	3	0	5	0	2	0	6	11	0	0	0	2	0	2	1	3	5	8

GH		Trans	portation	Services -	Traffic S	ervices	
	IWU	т	urning Mov	ement Cou	nt - Study I	Results	
				ST @ CAT			
Survey D	ate: Wedne	esday, April	18, 2018		wo	) No:	40743
Start Tin	ne: 07:00				Do	vice:	Miovision
•••••	01.00		<b>E</b> O	4			10100151011
				tudy 15 Mir			
			BANK S	ST	CAT	HERINE ST	
	Time	Period	Northbound U-Turn Total	Southbound U-Turn Total	Eastbound U-Turn Total	Westbound U-Turn Total	Total
_	07:00	07:15	0	0	0	0	0
	07:15	07:30	0	0	0	0	0
	07:30	07:45	0	0	0	0	0
	07:45	08:00	0	0	0	0	0
	08:00	08:15	0	0	0	0	0
	08:15	08:30	0	0	0	0	0
	08:30	08:45	0	0	0	0	0
	08:45	09:00	0	0	0	0	0
	09:00	09:15	0	0	0	0	0
	09:15	09:30	0	0	0	0	0
	09:30	09:45	0	0	0	0	0
	09:45	10:00	0	0	0	0	0
	11:30	11:45	0	0	0	0	0
	11:45	12:00	0	0	0	0	0
	12:00	12:15	0	0	0	0	0
	12:15	12:30	0	0	0	0	0
	12:30	12:45	0	0	0	0	0
	12:45	13:00	0	0	0	0	0
	13:00	13:15	0	0	0	0	0
	13:15	13:30	0	0	0	0	0
	15:00	15:15	0	0	0	0	0
	15:15	15:30	0	0	0	0	0
	15:30	15:45	0	0	0	0	0
	15:45	16:00	0	0	0	0	0
	16:00	16:15	0	0	0	0	0
	16:15	16:30	0	0	0	0	0
	16:30	16:45	0	0	0	0	0
	16:45	17:00	0	0	0	0	0
	17:00	17:15	0	0	0	0	0
	17:15	17:30	0	0	0	0	0
	17:30	17:45	0	0	0	0	0
-	17:45	18:00	0	0	0	0	0
	Te	ətal	0	0	0	0	0
		Star	0	0	0	0	Ū

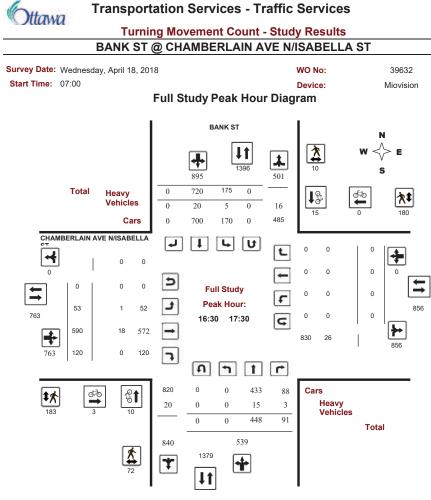


# Turning Movement Count - Study Results BANK ST @ CHAMBERLAIN AVE N/ISABELLA ST Survey Date: Wednesday, April 18, 2018 WO No: 39632

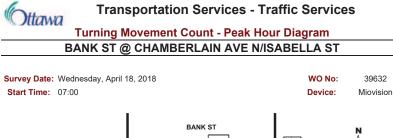
Survey Date: Wednesday, April 18, 2018		WO No:	39632
Start Time: 07:00		Device:	Miovision
	Full Study Diagram		
	BANK ST	1	N
	5086 UT 4677	65	W <∕≻ E S
Heavy Vehicles	180 68 0 193		913
Cars 0 CHAMBERLAIN AVE N/ISABELLA ST		0 1	1
		2 0	2 3
0         0         0         0           5482         522         17         505	۲ د	0 0	0 6442
4189 192 3997 5480 769 30 739		6131 308	6439
<u>د</u>			
	0 55775 515	Vehicles	Total
343 456			

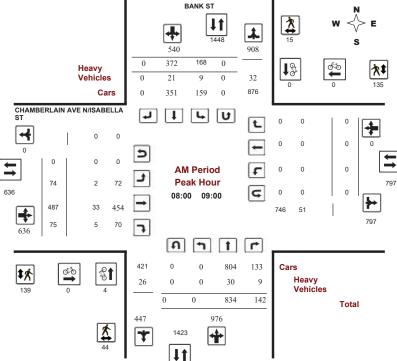
W.O. 5365004 - WED APR 18TH - CONSULTANT - (8HR REIMPORT)

May 28, 2020



W.O. 5365004 - WED APR 18TH - CONSULTANT - (8HR REIMPORT)



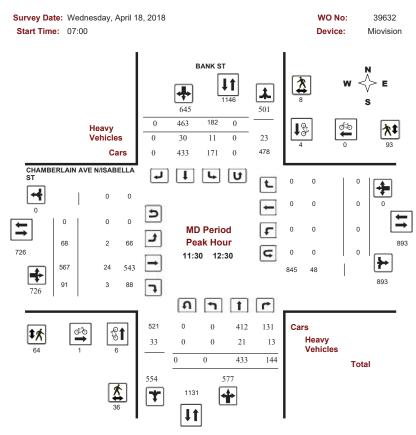


Comments W.O. 5365004 - WED APR 18TH - CONSULTANT - (8HR REIMPORT)

2020-May-28

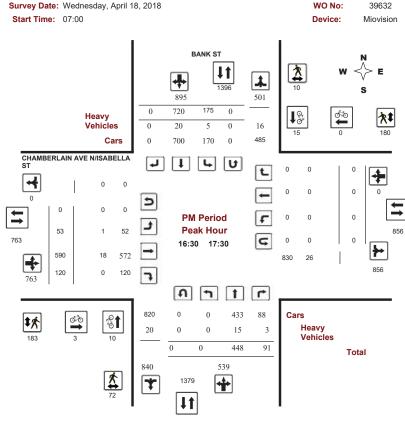


#### BANK ST @ CHAMBERLAIN AVE N/ISABELLA ST



Comments W.O. 5365004 - WED APR 18TH - CONSULTANT - (8HR REIMPORT)

Transportation Services - Traffic Services
Turning Movement Count - Peak Hour Diagram
BANK ST @ CHAMBERLAIN AVE N/ISABELLA ST



Comments W.O. 5365004 - WED APR 18TH - CONSULTANT - (8HR REIMPORT)

2020-May-28



#### Turning Movement Count - Study Results

#### BANK ST @ CHAMBERLAIN AVE N/ISABELLA ST

Start Tim	e: 0			April 1								Dev	ice:			Mio	vision		
				F	ull :	Stud	y Su	Imma	ary (8	3 HF	t Sta	nda	rd)						
Survey Da	te:	Wedne	esday,	April	18, 20	18	-		Total O	bserv	/ed U-	Turns	,				AAD.	T Facto	or
							N	lorthbou	nd: 0		Sout	hbound:	0				.90		
							I	Eastbou	nd: 0		Wes	tbound:	0						
			B	ANK S	т					CH	IAMBE	RLAIN	I AVE	N/ISAE	BELLA	ST			
	No	rthbou	nd		So	uthbou	nd			E	astbou	und		W	estbou	ind			
Period	LT	ST	RT	NB TOT	LT	ST	RT	SB TOT	STR TOT	LT	ST	RT	EB TOT	LT	ST	RT	WB TOT	STR TOT	Gran Tota
07:00 08:00	0	655	83	738	105	264	0	369	1107	58	391	56	505	0	2	0	2	507	161
08:00 09:00	0	834	142	976	168	372	0	540	1516	74	487	75	636	0	0	0	0	636	215
09:00 10:00	0	471	111	582	158	380	0	538	1120	84	499	68	651	0	0	1	1	652	177
11:30 12:30	0	433	144	577	182	463	0	645	1222	68	567	91	726	0	0	0	0	726	194
12:30 13:30	0	429	139	568	135	432	0	567	1135	67	518	115	700	0	0	0	0	700	183
15:00 16:00	0	441	139	580	185	523	0	708	1288	63	582	126	771	0	0	0	0	771	205
16:00 17:00	0	442	102	544	174	686	0	860	1404	54	565	99	718	0	0	0	0	718	212
17:00 18:00	0	449	101	550	182	677	0	859	1409	54	580	139	773	0	0	0	0	773	218
Sub Total	0	4154	961	5115	1289	3797	0	5086	10201	522	4189	769	5480	0	2	1	3	5483	1568
U Turns				0				0	0				0				0	0	(
Total	0	4154	961	5115	1289	3797	0	5086	10201	522	4189	769	5480	0	2	1	3	5483	1568
EQ 12Hr	0	5774	1336	7110	1792	5278	0	7070	14179	726	5823	1069	7617	0	3	1	4	7621	21801
Note: These v	alues a	re calcu	lated by	/ multipl	ying the	totals b	y the ap	ppropriat	e expans	ion fac	tor.			1.39					
AVG 12Hr	0	4898	1133	6031	1520	4477	0	5996	12761	615	4939	907	6461	0	2	1	4	6859	1962
Note: These v	olumes	are cal	culated	by multi	plying t	ne Equiv	alent 1	2 hr. tota	ils by the	AADT	factor.			0.9					
AVG 24Hr	0	6416	1484	7900	1991	5864	0	7855	15755	806	6470	1188	8464	0	3	2	5	8469	2422
Note: These v	olumes	are cal	hatelur	by multi	nlvina tl	he Avers	na Dail	ly 12 hr	totale by	12 to 2	4 evnan	sion fac	tor	1.31					



#### **Transportation Services - Traffic Services**

#### Turning Movement Count - Study Results BANK ST @ CHAMBERLAIN AVE N/ISABELLA ST

	Survey Date: Wednesday, April 18, 2018								WO No:						39632					
Star	t Time	: 07	7:00							Device:						Miovision				
							Fι	ull S	tud	v 1	5 Mi	nute	e Inc	rem	ents	5				
				BA		SТ					СНА	MBE	RLAI		N/IS/	ABEL	LA S			
		N	orthbo	und		Sc	outhbou	nd			F	astbour	nd		W	estbour	nd			
<b>T</b> :	Period	LT	ST	RT	Ν	LT	ST	RT	s	STR	LT	ST	RT	Е	LT	ST	RT	w	STR	Grand
Time	Period		51	RI	тот		51	RI	тот	тот		51	RI	тот	-	51	RI	тот	тот	Total
07:00	07:15	0	118	15	133	24	54	0	78	16	10	74	16	100	0	2	0	2	16	313
07:15	07:30	0	128	15	143	26	54	0	80	18	15	94	22	131	0	0	0	0	18	354
07:30	07:45	0	196	21	217	25	78	0	103	11	20	102	10	132	0	0	0	0	11	452
07:45	08:00	0	213	32	245	30	78	0	108	15	13	121	8	142	0	0	0	0	15	495
08:00	08:15	0	215	37	252	43	81	0	124	18	21	102	20	143	0	0	0	0	18	519
08:15	08:30	0	210	31	241	41	83	0	124	16	23	121	15	159	0	0	0	0	16	524
08:30	08:45	0	214	37	251	41	95	0	136	15	13	118	18	149	0	0	0	0	15	536
08:45	09:00	0	195	37	232	43	113	0	156	20	17	146	22	185	0	0	0	0	20	573
09:00	09:15	0	143	45	188	34	87	0	121	22	21	142	16	179	0	0	0	0	22	488
09:15	09:30	0	113	27	140	37	98	0	135	20	23	141	11	175	0	0	1	1	20	451
09:30	09:45	0	109	14	123	59	94	0	153	22	15	109	19	143	0	0	0	0	22	419
09:45	10:00	0	106	25	131	28	101	0	129	20	25	107	22	154	0	0	0	0	20	414
11:30	11:45	0	110	30	140	36	124	0	160	19	21	137	18	176	0	0	0	0	19	476
11:45	12:00	0	117	27	144	50	106	0	156	16	12	144	28	184	0	0	0	0	16	484
12:00	12:15	0	111	38	149	50	104	0	154	19	20	151	21	192	0	0	0	0	19	495
12:15	12:30	0	95	49	144	46	129	0	175	21	15	135	24	174	0	0	0	0	21	493
12:30	12:45	0	100	31	131	39	109	0	148	12	18	139	20	177	0	0	0	0	12	456
12:45	13:00	0	117	37	154	28	105	0	133	14	17	120	30	167	0	0	0	0	14	454
13:00	13:15	0	98	40	138	34	112	0	146	12	21	141	22	184	0	0	0	0	12	468
13:15	13:30	0	114	31	145	34	106	0	140	15	11	118	43	172	0	0	0	0	15	457
15:00	15:15	0	120	38	158	45	114	0	159	12	16	148	28	192	0	0	0	0	12	509
15:15	15:30	0	114	33	147	51	120	0	171	14	17	141	32	190	0	0	0	0	14	508
15:30	15:45	0	98	38	136	40	131	0	171	6	13	137	41	191	0	0	0	0	6	498
15:45	16:00	0	109	30	139	49	158	0	207	13	17	156	25	198	0	0	0	0	13	544
16:00	16:15	0	132	27	159	35	163	0	198	10	13	133	34	180	0	0	0	0	10	537
16:15	16:30	0	102	28	130	50	165	0	215	12	14	137	22	173	0	0	0	0	12	518
16:30	16:45	0	98	25	123	46	179	0	225	15	17	153	26	196	0	0	0	0	15	544
16:45	17:00	0	110	22	132	43	179	0	222	9	10	142	17	169	0	0	0	0	9	523
17:00	17:15	0	117	24	141	43	174	0	217	10	12	156	35	203	0	0	0	0	10	561
17:15	17:30	0	123	20	143	43	188	0	231	9	14	139	42	195	0	0	0	0	9	569
17:30	17:45	0	100	24	124	50	148	0	198	12	18	141	40	199	0	0	0	0	12	521
17:45	18:00	0	109	33	142	46	167	0	213	8	10	144	22	176	0	0	0	0	8	531
Total:		0	4154	961	5115	1289	3797	0	5086	471	522	4189	769	5480	0	2	1	3	471	15,684

Note: U-Turns are included in Totals.



#### Turning Movement Count - Study Results

#### BANK ST @ CHAMBERLAIN AVE N/ISABELLA ST

Survey Dat	te: Wednesda	y, April 18, 201	8		WO No:		39632
Start Time	<b>07:00</b>				Device:		Miovision
			Full Study	Cyclist V	olume		
		BANK ST	. an otaay		RLAIN AVE N/IS		
Time Period	Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	Grand Total
07:00 07:15	0	1	1	0	0	0	1
07:15 07:30	0	0	0	0	0	0	0
07:30 07:45	2	0	2	0	0	0	2
07:45 08:00	0	1	1	0	0	0	1
08:00 08:15	1	0	1	0	0	0	1
08:15 08:30	0	0	0	0	0	0	0
08:30 08:45	0	0	0	0	0	0	0
08:45 09:00	3	0	3	0	0	0	3
09:00 09:15	1	0	1	0	0	0	1
09:15 09:30	0	2	2	1	0	1	3
09:30 09:45	1	0	1	0	1	1	2
09:45 10:00	0	0	0	0	0	0	0
11:30 11:45	2	1	3	0	0	0	3
11:45 12:00	1	1	2	1	0	1	3
12:00 12:15	2	0	2	0	0	0	2
12:15 12:30	1	2	3	0	0	0	3
12:30 12:45	0	1	1	0	0	0	1
12:45 13:00	2	0	2	0	0	0	2
13:00 13:15	0	0	0	0	0	0	0
13:15 13:30	1	1	2	0	0	0	2
15:00 15:15	2	2	4	2	0	2	6
15:15 15:30	2	3	5	0	0	0	5
15:30 15:45	3	1	4	0	0	0	4
15:45 16:00	0	2	2	0	0	0	2
16:00 16:15	3	5	8	0	0	0	8
16:15 16:30	0	1	1	0	0	0	1
16:30 16:45	3	4	7	2	0	2	9
16:45 17:00	4	4	8	0	0	0	8
17:00 17:15	1	2	3	1	0	1	4
17:15 17:30	2	5	7	0	0	0	7
17:30 17:45	2	1	3	1	0	1	4
17:45 18:00	2	3	5	1	0	1	6
Total	41	43	84	9	1	10	94



#### **Transportation Services - Traffic Services**

#### Turning Movement Count - Study Results

#### BANK ST @ CHAMBERLAIN AVE N/ISABELLA ST

Survey Da	te: Wednesday	y, April 18, 2018			WO No:		39632
Start Tim	e: 07:00				Device:		Miovision
		F	ull Stud	ly Pedestria	n Volume		
		BANK ST			RLAIN AVE N/ISA	BELLA S	
Time Period	NB Approach (E or W Crossing)	SB Approach (E or W Crossing)	Total	EB Approach (N or S Crossing)	WB Approach (N or S Crossing)	Total	Grand Total
07:00 07:15	6	1	7	11	7	18	25
07:15 07:30	5	2	7	8	14	22	29
07:30 07:45	5	0	5	18	15	33	38
07:45 08:00	4	2	6	19	17	36	42
08:00 08:15	5	2	7	17	32	49	56
08:15 08:30	18	3	21	29	28	57	78
08:30 08:45	12	5	17	60	43	103	120
08:45 09:00	9	5	14	33	32	65	79
09:00 09:15	7	1	8	19	23	42	50
09:15 09:30	7	5	12	13	24	37	49
09:30 09:45	0	1	1	16	12	28	29
09:45 10:00	23	0	23	31	16	47	70
11:30 11:45	8	1	9	13	19	32	41
11:45 12:00	5	2	7	15	25	40	47
12:00 12:15	17	2	19	15	30	45	64
12:15 12:30	6	3	9	21	19	40	49
12:30 12:45	8	2	10	16	29	45	55
12:45 13:00	9	1	10	18	20	38	48
13:00 13:15	3	1	4	22	21	43	47
13:15 13:30	6	0	6	20	31	51	57
15:00 15:15	12	1	13	24	24	48	61
15:15 15:30	21	0	21	95	28	123	144
15:30 15:45	7	1	8	26	31	57	65
15:45 16:00	10	2	12	27	32	59	71
16:00 16:15	15	1	16	23	29	52	68
16:15 16:30	13	5	18	49	41	90	108
16:30 16:45	16	2	18	39	49	88	106
16:45 17:00	19	2	21	46	34	80	101
17:00 17:15	21	3	24	43	43	86	110
17:15 17:30	16	3	19	55	54	109	128
17:30 17:45	19	5	24	50	50	100	124
17:45 18:00	11	1	12	41	41	82	94
Total	343	65	408	932	913	1845	2253

W.O. 5365004 - WED APR 18TH - CONSULTANT - (8HR REIMPORT)

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6	ton	va		Transportation Services - Traffic Services																
	uav	пл			т	urn	ing	Μον	eme	ent	Cou	nt -	Stud	dy R	esu	lts				
				B	ANK	( ST	@	CHA	MB	ERI		I AV	ΈN	/ISA	BEI	LLA	ST			
Survey	Date	e: W	edne	esday,	April	18, 20	018							wo	No:			3	9632	
Start T	ime	07	2:00											Dev	ice:			Mi	ovisior	ı
							E	ull S	stud	v He	avy	Vel	nicle	es						
				BA	NK :	ST								N AVE	N/IS	ABEL	LA S			
		N	orthbo	und		So	outhbou	und			E	astboui	nd		We	estbour	nd			
Time Per	iod	LT	ST	RT	N TOT	LT	ST	RT	s тот	STR TOT	LT	ST	RT	Е ТОТ	LT	ST	RT	ТОТ	STR TOT	Grand Total
07:00 07	':15	0	7	0	7	0	9	0	9	16	0	5	1	6	0	0	0	0	6	22
	7:30	0	9	1	10	1	7	0	8	18	0	6	1	7	0	0	0	0	7	25
	7:45	0	6	0	6	1	4	0	5	11	1	4	1	6	0	0	0	0	6	17
	8:00	0	6	3	9	3	3	0	6	15	0	2	0	2	0	0	0	0	2	17
	8:15 8:30	0	8	1	9 9	4	5	0	9 7	18 16	0	8	1	9 4	0	0	0	0	9 4	27
	8:30 8:45	0	6	3	9	4	4	0	8	15	1	4	3	4	0	0	0	0	4	20
	9:00	0	10	4	14	4	5	0	6	20	1	13	1	15	0	0	0	0	15	35
	):15	0	5	6	11	5	6	0	11	22	2	7	1	10	0	0	0	0	10	32
	30	0	8	3	11	1	8	0	9	20	3	11	0	14	0	0	1	1	15	35
	9:45	0	6	1	7	6	9	0	15	22	1	7	3	11	0	0	0	0	11	33
09:45 10	00:00	0	4	1	5	5	10	0	15	20	0	3	3	6	0	0	0	0	6	26
11:30 11	:45	0	2	6	8	1	10	0	11	19	1	7	1	9	0	0	0	0	9	28
11:45 12	2:00	0	6	2	8	1	7	0	8	16	0	5	0	5	0	0	0	0	5	21
	2:15	0	9	1	10	4	5	0	9	19	0	4	0	4	0	0	0	0	4	23
	2:30	0	4	4	8	5	8	0	13	21	1	8	2	11	0	0	0	0	11	32
	2:45	0	3	2	5	1	6	0	7	12	0	4	1	5	0	0	0	0	5	17
	8:00	0	6	1	7	2	5	0	7	14	0	5	3	8	0	0	0	0	8	22
	8:15 8:30	0	4	1	5 8	3	4	0	7	12 15	1	9 7	0	10 9	0	0	0	0	10 9	22
	5:30	0	6	0	6 6	2	5	0	6	15	0	8	2	9	0	0	0	0	9	24
	5:30	0	3	1	4	1	9	0	10	14	1	0 4	1	6	0	0	0	0	6	20
	5:45	0	3	0	3	2	1	0	3	6	0	4	1	5	0	0	0	0	5	11
	6:00	0	6	0	6	3	4	0	7	13	1	4	1	6	0	0	0	0	6	19
16:00 16	6:15	0	5	1	6	0	4	0	4	10	1	8	2	11	0	0	0	0	11	21
16:15 16	6:30	0	5	0	5	5	2	0	7	12	1	6	0	7	0	0	0	0	7	19
16:30 16	6:45	0	6	1	7	2	6	0	8	15	1	1	0	2	0	0	0	0	2	17
16:45 17	7:00	0	4	1	5	2	2	0	4	9	0	5	0	5	0	0	0	0	5	14
17:00 17	7:15	0	4	0	4	0	6	0	6	10	0	6	0	6	0	0	0	0	6	16
	7:30	0	1	1	2	1	6	0	7	9	0	6	0	6	0	0	0	0	6	15
	':45	0	5	1	6	1	5	0	6	12	0	6	1	7	0	0	0	0	7	19
	8:00	0	5	0	5	1	2	0	3	8	0	7	0	7	0	0	0	0	7	15
Total: No	one	0	175	48	223	68	180	0	248	471	17	192	30	239	0	0	1	1	240	711

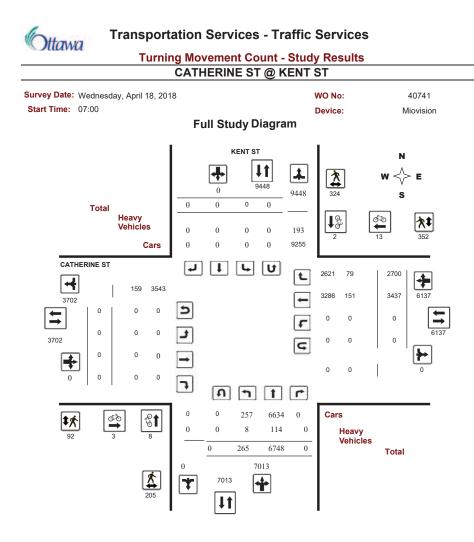


**Turning Movement Count - Study Results** 

#### BANK ST @ CHAMBERLAIN AVE N/ISABELLA ST

	esday, April	, 2010			O No:	39632
ne: 07:00					vice:	Miovisior
		Full S	tudy 15 Mir	าute U-Turr	n Total	
		BANKS	ъ	CHAMBERLAI	N AVE N/ISABEL	LA S
Time I	Period	Northbound U-Turn Total	Southbound U-Turn Total	Eastbound U-Turn Total	Westbound U-Turn Total	Total
07:00	07:15	0	0	0	0	0
07:15	07:30	0	0	0	0	0
07:30	07:45	0	0	0	0	0
07:45	08:00	0	0	0	0	0
08:00	08:15	0	0	0	0	0
08:15	08:30	0	0	0	0	0
08:30	08:45	0	0	0	0	0
08:45	09:00	0	0	0	0	0
09:00	09:15	0	0	0	0	0
09:15	09:30	0	0	0	0	0
09:30	09:45	0	0	0	0	0
09:45	10:00	0	0	0	0	0
11:30	11:45	0	0	0	0	0
11:45	12:00	0	0	0	0	0
12:00	12:15	0	0	0	0	0
12:15	12:30	0	0	0	0	0
12:30	12:45	0	0	0	0	0
12:45	13:00	0	0	0	0	0
13:00	13:15	0	0	0	0	0
13:15	13:30	0	0	0	0	0
15:00	15:15	0	0	0	0	0
15:15	15:30	0	0	0	0	0
15:30	15:45	0	0	0	0	0
15:45	16:00	0	0	0	0	0
16:00	16:15	0	0	0	0	0
16:15	16:30	0	0	0	0	0
16:30	16:45	0	0	0	0	0
16:45	17:00	0	0	0	0	0
17:00	17:15	0	0	0	0	0
17:15	17:30	0	0	0	0	0
17:30	17:45	0	0	0	0	0
17:45	18:00	0	0	0	0	0
T	otal	0	0	0	0	0

May 28, 2020



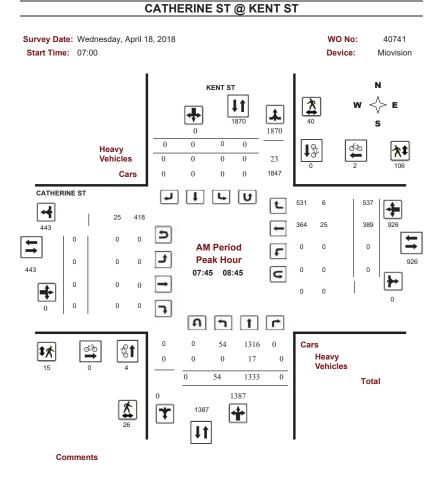


Turning Movement Count - Study Results

	CATHERINE ST @ KE	NT ST	
Survey Date: Wednesday, April 18, 20 Start Time: 07:00	Full Study Peak Hour D	WO No: Device: Diagram	40741 Miovision
Total         Heavy Vehicles           Cars           Cars           CATHERINE ST         25         418           443         0         0         0           443         0         0         0         0           443         0         0         0         0         0	0       0       0       18/0       18         0       0       0       0       18         0       0       0       0       10         0       0       0       0       14         +       +       +       +       +         +       +       +       +       +         +       +       +       +       +         +       +       +       +       +         +       +       +       +       +         +       +       +       +       +         +       +       +       +       +         +       +       +       +       +         +       +       +       +       +         +       +       +       +       +         +       +       +       +       +         +       +       +       +       +         +       +       +       +       +         +       +       +       +       +         +       +       +       +       +         +       + <t< th=""><th>▲       ▲       ↓</th><th><math display="block">N</math> <math display="block">W  \swarrow  E</math> <math display="block">S</math> <math display="block">I  I  I  I  I  I  I  I  I  I </math></th></t<>	▲       ▲       ↓	$N$ $W  \swarrow  E$ $S$ $I  I  I  I  I  I  I  I  I  I $
$\begin{bmatrix} 0 & 0 & 0 & 0 \\ \hline 0 & 15 & 0 \end{bmatrix} \begin{bmatrix} \hline 0 & 0 & 0 \\ \hline 0 & 4 \\ \hline 4 & 0 \\ \hline 26 \end{bmatrix}$	0     0     54     1316       0     0     17       0     54     1333       0     1387       1387       1387       11	Cars 0 0 0 0 0	s Total



## **Turning Movement Count - Peak Hour Diagram**



Ottawa **Turning Movement Count - Peak Hour Diagram** CATHERINE ST @ KENT ST Survey Date: Wednesday, April 18, 2018 WO No: 40741 Start Time: 07:00 Device: Miovision Ν KENT ST \* <} E l11 w ♣ \* 894 41 s 0 894 0 0 0 0 13 ¢⊅ ♦ Heavy **₹** Vehicles 0 0 0 0 19 15 875 Cars 0 0 0 0 CATHERINE ST 4 **L** Ŧ. 10 240 4 244 t 4 4 23 476 444 23 467 711 499 -5 11 0 0 0 ţţ 0 **MD Period** 0 0 F t Peak Hour 711 0 0 0 499 G 0 0 0 11:45 12:45 ₩ 0 0 -----0 + 0 0 0 0 0 0 ٦ 0 A 1 1 1 0 0 32 635 0 Cars ₫ 81 **\$** Heavy 0 15 0 0 0 Vehicles 12 0 0 32 650 0 Total 682 \$ + \* 682 26 **I**t

**Transportation Services - Traffic Services** 

Comments

Page 1 of 9

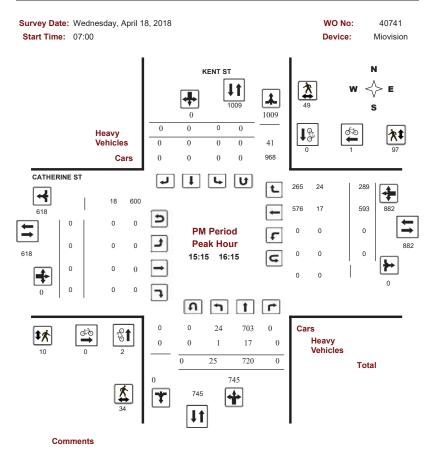
2023-Jan-13

2023-Jan-13



Turning Movement Count - Peak Hour Diagram

#### CATHERINE ST @ KENT ST



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#### **Transportation Services - Traffic Services**

#### **Turning Movement Count - Study Results** CATHERINE ST @ KENT ST Survey Date: Wednesday, April 18, 2018 WO No: Start Time: 07:00 Device: Miovision Full Study Summary (8 HR Standard) Survey Date: Wednesday, April 18, 2018 **Total Observed U-Turns** AADT Factor Northbound: 0 Southbound: 0 .90 Eastbound: Westbound: () KENT ST CATHERINE ST Northbound Southbound Eastbound Westbound NB SB STR EB WB STR Grand LT ST RT LT ST RT LT ST RT LT ST RT Period TOT TOT TOT TOT тот тот Total 07:00 08:00 08:00 09:00 09:00 10:00 11:30 12:30 12:30 13:30 Λ 15:00 16:00 Λ 16:00 17:00 17:00 18:00 Sub Total U Turns Total 3437 2700 EQ 12Hr 1.39 Note: These values are calculated by multiplying the totals by the appropriate expansion factor AVG 12Hr 4299 3378 Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor .90 5632 4425 10057 AVG 24Hr 1.31 Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor. Note: U-Turns provided for approach totals. Refer to 'U-Turn' Report for specific breakdown.

Survey Date:           Start Time:         ()           Start Time:         ()           07:00         07:15         7           07:00         07:15         7           07:00         07:15         7           07:00         07:15         7           07:00         07:15         7           07:00         07:15         7           08:16         08:00         12           08:00         08:45         17           08:30         08:45         17           08:30         09:345         8           09:31         09:45         8           09:32         09:45         10:00           11:30         11:45         13           11:45         12:00         12:15           12:00         12:15         6           12:15         12:30         10           12:30         12:45         13           12:45         13:00         9	07:00 Northbo T ST 277 3 293 9 312 2 343 2 314 3 347 7 329	ĸ	April ENT S N TOT 284 301 321 355	18, 20 ST	CA D18 F Duthbou ST 0	ATH ull S	ERI	ent C NE S y 15	6T ((	) KI	ENT	ST wo Devi	No: ice:			-	0741 ovisior	1		
Start Time:         Image: Construct to the second sec	07:00 Northbo T ST 277 3 293 9 312 2 343 2 314 3 347 7 329	KI RT 0 0 0 0	ENT S N TOT 284 301 321 355	ST Sc LT 0	D18 F Duthbou ST 0	ull S	s s	y 15	5 Mi	nute	Inc	WO Devi	ice:	6		-		1		
Start Time:         Image: Construct to the second sec	07:00 Northbo T ST 277 3 293 9 312 2 343 2 314 3 347 7 329	KI RT 0 0 0 0	ENT S N TOT 284 301 321 355	ST Sc LT 0	Fi outhbou ST 0	Ind RT	s	-				Devi rem	ice:	6		-		I		
Time Period         LT           07:00         07:15         7           07:15         07:30         8           07:30         07:45         9           07:45         08:00         92           08:00         08:16         12           08:15         08:30         13           08:30         08:45         17           09:30         09:15         8           09:45         09:30         12           09:30         09:45         13           11:30         11:45         13           11:45         12:00         12           12:00         12:15         16:30           12:30         12:45         9	Northbo T ST 7 2777 3 293 9 312 2 343 2 314 3 347 7 329	und <b>RT</b> 0 0 0 0 0 0	N TOT 284 301 321 355	Sc LT 0	outhbou ST	Ind RT	s	-				rem		6		Mic	ovisior	I		
Time Period         LT           07:00         07:15         7           07:01         07:30         8           07:30         07:45         9           07:45         08:00         103:15         12           08:00         08:15         12         08:16         133           08:30         08:345         17         09:00         09:15         8           09:15         08:30         01:30         09:30         12         09:30         09:15         8           09:15         09:30         09:15         8         09:30         12         09:31         13           11:30         11:45         12:00         13         11:45         13         11:45         12:00         17           12:00         12:15         12:30         10         12:45         9         12:45         9	T         ST           277         293           3         293           9         312           2         343           2         314           3         347           7         329	und <b>RT</b> 0 0 0 0 0 0	N TOT 284 301 321 355	Sc LT 0	outhbou ST	Ind RT	s	-					ents	5						
Time Period         LT           07:00         07:15         7           07:01         07:30         8           07:30         07:45         9           07:45         08:00         103:15         12           08:00         08:15         12         08:00         133           08:30         08:45         17         09:00         09:15         8           09:15         08:30         08:45         17         09:30         09:16         8           09:15         09:30         09:15         8         09:16         8         09:15         13           11:30         11:45         12:00         12         11:45         13         11:45         13           11:45         12:00         17         12:00         12         12:30         10	T         ST           277         293           3         293           9         312           2         343           2         314           3         347           7         329	und <b>RT</b> 0 0 0 0 0 0	N TOT 284 301 321 355	Sc LT 0	outhbou ST	Ind RT	s	-												
Time Period         LT           07:00         07:15         7           07:01         07:30         8           07:30         07:45         9           07:45         08:00         103:15         12           08:00         08:15         12         08:00         133           08:30         08:45         17         09:00         09:15         8           09:15         08:30         08:45         17         09:30         09:16         8           09:15         09:30         09:15         8         09:16         8         09:15         13           11:30         11:45         12:00         12         11:45         13         11:45         13           11:45         12:00         17         12:00         12         12:30         10	T         ST           277         293           3         293           9         312           2         343           2         314           3         347           7         329	RT 0 0 0 0	TOT 284 301 321 355	LT 0 0	ST 0	RT		STR	E		UA II	HERIN	IE ST							
07:00         07:15         7           07:30         07:45         9           07:30         07:45         9           07:45         08:00         12           08:00         08:15         12           08:01         08:30         13           08:30         08:45         17           09:00         09:15         8           09:01         09:00         12           09:30         09:45         8           09:41         10:00         7           11:30         11:45         12:00           11:30         12:15         12:30           11:20         12:15         12:30	7 277 3 293 9 312 2 343 2 314 3 347 7 329	0 0 0 0	TOT 284 301 321 355	0	0			STR	Northbound Southbound Eastbound Westbound											
07:15         07:30         8           07:30         07:45         9           07:45         08:00         12           08:00         08:15         12           08:15         08:30         13           08:30         08:45         17           08:45         09:00         12           09:00         09:15         8           09:15         09:30         12           09:30         09:45         8           11:30         11:45         13           11:45         12:00         7           12:01         12:15         6:10           12:31         12:32         12:45	3         293           3         312           2         343           2         314           3         347           7         329	0 0 0	301 321 355	0		0		TOT	LT	ST	RT	E TOT	LT	ST	RT	w тот	STR TOT	Grand Total		
97:30         07:45         9           97:45         08:00         12           98:00         08:15         12           98:15         08:30         13           98:15         08:30         12           99:00         99:15         8           99:00         99:15         8           99:30         09:45         8           99:30         19:45         13           11:30         11:45         13           11:45         12:00         7           12:200         12:15         6           12:10         12:15         12:30           12:30         12:45         19	312           343           312           343           314           3347           7329	0 0 0	321 355				0	284	0	0	0	0	0	72	116	188	188	472		
77:45         08:00         12           38:00         08:15         12           38:10         08:31         13           38:30         08:45         13           38:30         08:45         13           38:30         08:45         13           38:30         08:45         13           38:30         08:45         13           38:30         08:45         13           38:30         08:45         13           38:30         08:45         12           39:00         09:15         8           39:30         09:34         12           39:30         09:45         13           11:30         11:45         13           11:45         12:00         12           12:00         12:01         7           12:01         12:15         16           12:30         10         12:30	2 343 2 314 3 347 7 329	0	355		0	0	0	301 321	0	0	0	0	0	58 90	123 117	181 207	181 207	482 528		
38:15         08:30         13           38:30         08:45         17           38:45         09:00         12           39:00         09:01         12           39:00         09:15         08           39:15         09:30         12           39:03         09:45         8           39:45         10:00         13           11:30         11:45         13           11:45         12:00         7           12:01         12:15         12:30           12:30         12:30         12	3 347 7 329		226	0	0	0	0	355	0	0	0	0	0	84	148	232	232	587		
08:30         08:45         17           08:45         09:00         12           09:00         99:15         8           09:15         09:30         09:45           09:30         09:44         8           09:45         10:00         13           11:45         13           11:45         12:00         7           12:00         12:15         6           12:15         12:30         10           12:30         12:45         9	7 329	0	326	0	0	0	0	326	0	0	0	0	0	100	134	234	234	560		
08:45         09:00         12           09:00         09:15         8           09:15         09:30         12           09:00         09:45         8           09:45         10:00         13           11:30         11:45         13           11:45         12:00         7           12:00         12:15         6           12:15         12:30         10           12:30         12:45         9	-		360	0	0	0	0	360	0	0	0	0	0	98	127	225	225	585		
09:00         09:15         8           09:15         09:30         12           09:30         09:45         8           09:45         10:00         13           11:30         11:45         13           11:45         12:00         7           12:00         12:15         6           12:15         12:30         10           12:30         12:45         9	2 330	0	346 348	0	0	0	0	346	0	0	0	0	0	107 87	128	235 228	235 228	581		
09:15         09:30         12           09:30         09:45         8           09:45         10:00         13           11:30         11:45         13           11:45         12:00         7           12:00         12:15         6           12:15         12:30         10           12:30         12:45         9	293	0	348	0	0	0	0	348 301	0	0	0	0	0	87 95	141 97	192	192	576 493		
09:45         10:00         13           11:30         11:45         13           11:45         12:00         7           12:00         12:15         6           12:15         12:30         10           12:30         12:45         9		0	241	0	0	0	0	241	0	0	0	0	0	104	91	195	195	436		
11:30       11:45       13         11:45       12:00       7         12:00       12:15       6         12:15       12:30       10         12:30       12:45       9	225	0	233	0	0	0	0	233	0	0	0	0	0	112	76	188	188	421		
11:4512:00712:0012:15612:1512:301012:3012:459		0	234	0	0	0	0	234	0	0	0	0	0	100	78	178	178	412		
12:00         12:15         6           12:15         12:30         10           12:30         12:45         9		0	182	0	0	0	0	182	0	0	0	0	0	105	52	157	157	339		
12:15 12:30 10 12:30 12:45 9		0	157 139	0	0	0	0	157 139	0	0	0	0	0	105 125	68 50	173 175	173 175	330 314		
12:30 12:45 9	-	0	184	0	0	0	0	184	0	0	0	0	0	117	61	178	178	362		
12:45 13:00 9	193	0	202	0	0	0	0	202	0	0	0	0	0	120	65	185	185	387		
12.10 10.00 0	160	0	169	0	0	0	0	169	0	0	0	0	0	125	31	156	156	325		
13:00 13:15 8		0	142	0	0	0	0	142	0	0	0	0	0	108	34	142	142	284		
13:15 13:30 14 15:00 15:15 8		0	158 159	0	0	0	0	158 159	0	0	0	0	0	124 120	44 90	168 210	168 210	326 369		
15:15 15:30 10		0	159	0	0	0	0	159	0	0	0	0	0	120	90 67	210	210	369		
15:30 15:45 3		0	183	0	0	0	0	183	0	0	0	0	0	156	69	225	225	408		
15:45 16:00 8		0	181	0	0	0	0	181	0	0	0	0	0	126	76	202	202	383		
16:00 16:15 4		0	223	0	0	0	0	223	0	0	0	0	0	157	77	234	234	457		
16:15 16:30 0 16:30 16:45 5		0	102	0	0	0	0	102	0	0	0	0	0	144	92 79	236	236	338		
16:30 16:45 5 16:45 17:00 9	_	0	118 165	0	0	0	0	118 165	0	0	0	0	0	100 78	79 63	179 141	179 141	297 306		
17:00 17:15 4		0	103	0	0	0	0	105	0	0	0	0	0	100	70	170	170	367		
17:15 17:30 1	-	0	194	0	0	0	0	194	0	0	0	0	0	95	88	183	183	377		
17:30 17:45 4	158	0	162	0	0	0	0	162	0	0	0	0	0	86	90	176	176	338		
17:45 18:00 2 Total: 265	186	0	188 7013	0	0	0	0	188 7013	0	0	0	0	0	85 3437	58 2700	143 6137	143 6137	331 13,150		

Note: U-Turns are included in Totals.



#### **Transportation Services - Traffic Services**

## Turning Movement Count - Study Results

97:00         07:15         0         0           97:00         07:15         0         0         0           97:00         07:30         0         0         0         0           97:00         07:45         0         11:45         1         0         0         0         11:45         1         0         0         11:45         1         0         1         1:2:30         1         1         1:45         1         0         0	8, 2018		WO No:		40741
Ime Period         Northbound         Southb           77:00         07:15         0         0         0           77:15         07:30         0         0         0         0           77:15         07:30         07:45         0         0         0           77:15         07:45         0         0         0         0           77:15         07:45         0         0         0         0           77:30         07:45         0         0         0         0           77:45         08:00         1         0<			Device:		Miovision
Ime Period         Northbound         Southb           77:00         07:15         0         0         0           77:15         07:30         0         0         0         0           77:15         07:30         07:45         0         0         0           77:15         07:45         0         0         0         0           77:15         07:45         0         0         0         0           77:30         07:45         0         0         0         0           77:45         08:00         1         0<	Full Study	y Cyclist V	olume		
Fine Period         Northbound         Southb           07:00         07:15         0         0         0           07:15         07:30         07:45         0         0         0           07:45         07:30         07:45         0         0         0           07:45         08:00         1         0         0         0           07:45         08:00         1         0         0         0           07:45         08:00         1         0 <th></th> <th>y cychot v</th> <th>CATHERINE S</th> <th>т</th> <th></th>		y cychot v	CATHERINE S	т	
77.15         07.30         0         0           77.15         07.45         0         0           77.45         08.00         1         0           77.45         08.00         1         0           77.45         08.00         1         0           77.45         08.00         1         0           77.45         08.00         1         0           77.45         08.00         1         0           77.45         08.00         1         0           77.45         08.30         1         0           77.45         08.30         1         0           77.45         08.30         1         0           77.45         09.30         0         0         0           79.00         09.30         0         0         0           79.30         09.30         0         0         0           79.30         09.30         0         0         0           79.30         99.30         0         0         0           11.30         11.45         0         0         0           12.30         12.45         0	-	Eastbound	Westbound	Street Total	Grand Total
97:30         97:45         0         0           97:30         97:45         0         0           97:30         97:45         0         1         0           98:00         98:15         1         0         0           98:15         88:30         1         0         0           98:15         98:30         1         0         0           98:30         98:45         1         0         0           99:00         99:15         0         0         0           99:15         99:30         0         0         0           99:45         0         0         0         0           99:45         10:00         0         0         0           11:45         12:00         0         0         0           12:01         12:15         0         0         0           12:01         12:15         0         0         0           12:25         13:00         0         0         0           13:15         13:30         0         0         0           15:15         0         0         0         0	0	0	0	0	0
37.45         08.00         1         0           37.45         08.00         1         0           38.00         08.15         1         0           38.15         08.30         1         0           38.15         08.30         1         0           38.15         1         0         0           38.45         1         0         0           38.45         99.00         0         0           38.45         99.00         0         0           38.45         99.00         0         0           38.45         0         0         0           38.45         0.90         0         0           38.45         0         0         0           39.30         99.45         0         0           39.30         99.45         0         0           39.30         11.145         0         0         0           11.20         12.15         0         0         0           12.15         12.30         0         1         0           12.245         1         0         0         0           15.00 <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td>	0	0	0	0	0
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	0	0	0	0	0
38:15         08:30         1         0           38:30         08:45         1         0           38:30         08:45         1         0           38:45         08:00         0         0           39:00         09:15         0         0           39:00         99:30         0         0         0           39:30         09:45         0         0         0           39:31         99:45         0         0         0           39:45         10:00         0         0         0           11:45         1         0         0         0           11:45         1         0         0         0           12:00         12:15         0         0         0           12:01         12:45         1         0         0           13:02         13:15         0         0         0           13:15         13:30         0         0         0           15:30         15:45         0         0         0           15:31         15:30         0         0         0           15:45         16:00         0	1	0	0	0	1
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	1	0	0	0	1
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	1	0	2	2	3
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	1	0	0	0	1
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	0	0	0	0	0
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	0	0	2	2	2
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	0	0	0	0	0
11:30         11:45         0         0           11:45         12:00         0         0         0           11:45         12:00         0         0         0         0           12:15         12:00         12:15         0         0         1           12:30         12:45         1         0         0         1           12:30         12:45         1         0         0         1           12:30         15:45         0         0         0         1           13:15         13:30         0         0         0         1         1         1         0         0         1         1         1         0         0         0         1         1         1         0         0         1         1         1         0         0         0         0         1 <t< td=""><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></t<>	0	0	0	0	0
11:45         12:00         0         0           12:00         12:15         0         0           12:00         12:15         0         0           12:15         0         0         1           12:30         12:45         1         0         0           12:45         1.3:00         0         0         0           13:00         13:15         0         0         0           13:00         13:15         0         0         0           15:00         15:15         0         0         0           15:31         15:30         0         0         0           15:45         0         0         0         0           15:45         0         0         0         0           15:45         0         0         0         0           16:00         16:15         2         0         0           16:32         0         0         0         0           16:33         16:45         0         0         0           16:33         16:45         0         0         1           17:30         0         0<	0	0	0	0	0
12:00         12:15         0         0           12:15         1         0         1           12:30         0         1         1           12:30         0         1         0           12:45         1         0         0           13:00         0         0         0           13:00         13:15         0         0         0           15:00         15:15         0         0         0           15:01         15:15         0         0         0           15:30         15:45         0         0         0           15:45         16:00         0         0         0           15:45         0         0         0         0           15:45         0         0         0         0           16:15         16:30         0         0         0           16:15         16:30         0         0         0           16:30         16:45         0         0         0           16:45         0         0         1         1           17:50         0         0         0	0	0	0	0	0
12:15         12:30         0         1           12:30         12:45         1         0           12:45         1         0         0           12:45         1         0         0           12:45         13:00         0         0           13:15         0         0         0           13:15         13:30         0         0         0           15:01         15:15         15:30         0         0         0           15:45         0         0         0         0         1           15:45         0         0         0         0         1           16:00         16:15         2         0         0         0           16:00         16:15         2         0         0         0           16:30         16:45         0         0         0         0           16:30         16:45         0         0         1         1           17:00         17:15         0         0         0         1	0	0	0	0	0
12:30         12:45         1         0           12:45         1         0         0         0           12:45         1         0         0         0         0           12:45         1         0         0         0         0         0           13:00         13:15         0         0         0         0         15:15         0         0         0         15:15         15:30         15:45         0         0         0         15:45         15:30         15:45         0         0         0         15:45         16:00         0         0         15:45         16:00         0         0         16:40         16:40         0         0         16:40         16:45         0         0         0         16:45         0         0         0         16:45         0         0         16:45         16:45         0         0         16:45         16:45         0         0         16:45         17:40         17:15         0         0         17:15         17:30         0         0         0         17:15         17:30         0         0         0         17:15         17:30         17:15         17:45 <td>0</td> <td>0</td> <td>1</td> <td>1</td> <td>1</td>	0	0	1	1	1
12:45         13:00         0         0           13:00         13:15         0         0           13:15         13:15         0         0           13:15         13:15         0         0           15:15         15:00         15:15         0         0           15:15         15:30         0         0         0           15:15         15:30         0         0         0           15:15         15:30         0         0         0           15:45         0         0         0         0           15:45         0         0         0         0           16:00         16:15         2         0         0           16:15         16:30         0         0         0           16:30         16:45         0         0         1           17:00         17:15         0         0         0	1	0	0	0	1
13:00         13:15         0         0           13:15         13:30         0         0         0           15:00         15:15         15:30         0         0         0           15:00         15:15         15:30         0         0         0           15:30         15:45         0         0         0         0           15:45         16:00         0         0         0         0           16:45         2         0         0         0         0           16:15         16:30         0         0         0         0           16:30         16:45         0         0         0         1           17:00         17:00         0         1         1         1         1         0         0	1	0	0	0	1
13:15         13:30         0         0           15:00         15:15         15:30         0         0           15:15         15:30         0         0         0           15:30         15:45         0         0         0           15:30         15:45         0         0         0           15:30         15:45         0         0         0           16:00         16:15         2         0         0           16:30         16:45         0         0         0           16:30         16:45         0         0         1           17:00         17:15         0         0         0           17:15         17:30         0         0         0	0	0	0	0	0
15:00         15:15         0         0           15:15         15:30         0         0         0           15:30         15:45         0         0         0           15:45         16:00         0         0         0           15:45         16:00         0         0         0           16:15         16:30         0         0         0           16:15         16:30         0         0         0           16:30         16:45         0         0         0           16:45         17:00         0         1         1           17:00         17:15         0         0         0	0	0	0	0	0
15:15         15:30         0         0           15:30         15:45         0         0           15:45         15:45         0         0           15:45         16:00         0         0           15:45         16:00         0         0           16:15         2         0         0           16:15         16:30         0         0           16:30         16:45         0         0           16:45         0         0         1           17:00         17:15         0         0           17:15         17:30         0         0	0	1	0	1	1
15:30         15:45         0         0           15:45         16:00         0         0           15:45         16:00         0         0           16:15         2         0         0           16:15         16:30         0         0           16:45         10         0         0           16:45         0         0         1           17:00         17:15         0         0           17:15         17:30         0         0	0	0	1	1	1
15:45         16:00         0         0           16:00         16:15         2         0           16:15         16:30         0         0           16:30         16:45         0         0           16:45         17:00         1         1           17:00         17:15         0         0           17:15         17:30         0         0	0	0	0	0	0
16:00         16:15         2         0           16:15         16:30         0         0           16:30         16:45         0         0           16:45         17:00         0         1           17:00         17:15         0         0           17:15         17:30         0         0	0	0	0	0	0
16:15         16:30         0         0           16:30         16:45         0         0           16:45         17:00         0         1           17:00         17:15         0         0           17:15         17:30         0         0	0	0	1	1	1
16:30         16:45         0         0           16:45         17:00         0         1           17:00         17:15         0         0           17:15         17:30         0         0	2	0	0	0	2
16:45         17:00         0         1           17:00         17:15         0         0           17:15         17:30         0         0	0	0	3	3	3
17:00         17:15         0         0           17:15         17:30         0         0	0	0	1	1	1
17:15 17:30 0 0	1	1	0	1	2
	0	0	1	1	1
	0	1	0	1	1
17:30 17:45 0 0	0	0	0	0	0
17:45 18:00 1 0	1	0	1	1	2

Ottou	T	ransportat	ion Se	rvices - Tra	ffic Servic	es	
Juan	<i>u</i>	Turning	Movem	ent Count -	Study Resul	ts	
		C	ATHER	INE ST @ KI	ENT ST		
Survey Date	: Wednesday	/, April 18, 2018			WO No:		40741
Start Time:	07:00				Device:		Miovision
		6	ull Stud	ly Pedestriar			
		KENT ST	un otuc	iy i edestilai	CATHERINE ST		
		RENT ST			CATTERINE ST		
	NB Approach or W Crossing)	SB Approach (E or W Crossing)	Total	EB Approach (N or S Crossing)	WB Approach (N or S Crossing)	Total	Grand Total
07:00 07:15	2	9	11	3	0	3	14
07:15 07:30	0	4	4	0	3	3	7
07:30 07:45	4	9	13	5	9	14	27
07:45 08:00	7	8	15	4	6	10	25
08:00 08:15 08:15 08:30	8	12	20	5	8 20	13	33
08:15 08:30	8	9	17	6	20	26	43
08:45 09:00	10	10	14	3	15	72	86
09:00 09:15	8	6	14	2	5	7	21
09:15 09:30	4	7	14	4	5	9	20
09:30 09:45	8	15	23	2	2	4	20
09:45 10:00	6	8	14	- 8	2	10	24
11:30 11:45	8	10	18	2	6	8	26
11:45 12:00	4	12	16	2	6	8	24
12:00 12:15	12	12	24	5	3	8	32
12:15 12:30	5	11	16	3	6	9	25
12:30 12:45	5	6	11	2	0	2	13
12:45 13:00	9	15	24	9	2	11	35
13:00 13:15	7	8	15	0	3	3	18
13:15 13:30	6	11	17	0	7	7	24
15:00 15:15	5	13	18	3	9	12	30
15:15 15:30	8	15	23	4	77	81	104
15:30 15:45	10	12	22	2	2	4	26
15:45 16:00	8	8	16	3	9	12	28
16:00 16:15	8	14	22	1	9	10	32
16:15 16:30	10	12	22	5	11	16	38
16:30 16:45	8	4	12	1	2	3	15
16:45 17:00 17:00 17:15	4 8	15 10	19 18	0	12	12	31 34
17:00 17:15	7	9	18	3	13	16	34
17:15 17:30	4	9	16	2	8	15	28
17:45 18:00	4	5	6	0	8	8	14
Total	205	324	529	92	352	444	973
10tai	200	024	525	92	552		313



#### Turning Movement Count - Study Results CATHERINE ST @ KENT ST

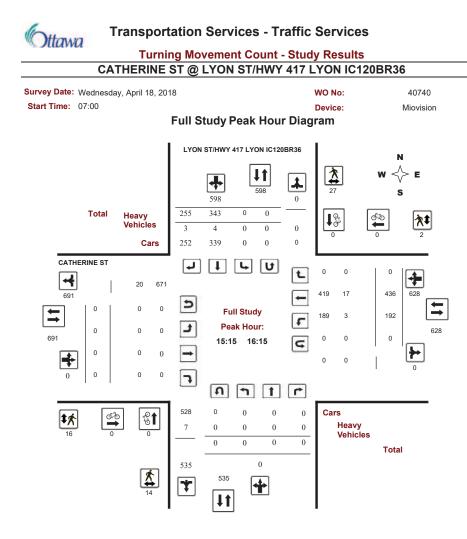
Survey Da			esday,	April	18, 20	7.18							wo	NO:			4	0741	
Start Tim	e: 0	7:00											Dev	ice:			Mie	ovision	n
						F	ull S	Stud	y He	avy	Veł	nicle	s						
			KI	ENT S	т				-				HERIN	IE ST					
	N	orthbo	und		Sc	outhbou	ind			F	astbour	hd		We	estbour	hd			
Time Period		ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	Е ТОТ	LT	ST	RT	W	STR	Grand
07:00 07:15	LT 0	1	0	101	0	0	0	2	3	0	0	0	101	0	11	1	TOT 12	TOT 23	Total 13
07:15 07:30	0	2	0	2	0	0	0	4	6	0	0	0	5	0	5	2	7	12	9
07:30 07:45	1	1	0	2	0	0	0	6	8	0	0	0	6	0	5	5	10	16	12
07:45 08:00	0	4	0	4	0	0	0	7	11	0	0	0	4	0	4	3	7	11	11
08:00 08:15	0	3	0	3	0	0	0	5	8	0	0	0	10	0	10	2	12	22	15
08:15 08:30	0	3	0	3	0	0	0	4	7	0	0	0	4	0	4	1	5	9	8
08:30 08:45	0	7	0	7	0	0	0	7	. 14	0	0	0	7	0	7	0	7	14	14
08:45 09:00	0	5	0	5	0	0	0	7	12	0	0	0	4	0	4	2	6	10	11
09:00 09:15	0	6	0	6	0	0	0	8	14	0	0	0	4	0	4	2	6	10	12
09:15 09:30	0	4	0	4	0	0	0	6	10	0	0	0	10	0	10	2	12	22	16
09:30 09:45	0	4	0	4	0	0	0	5	9	0	0	0	7	0	7	1	8	15	12
09:45 10:00	0	7	0	7	0	0	0	12	19	0	0	0	4	0	4	5	9	13	16
11:30 11:45	1	4	0	5	0	0	0	6	11	0	0	0	2	0	1	2	3	5	8
11:45 12:00	0	2	0	2	0	0	0	2	4	0	0	0	5	0	5	0	5	10	7
12:00 12:15	0	3	0	3	0	0	0	3	6	0	0	0	3	0	3	0	3	6	6
12:15 12:30	0	6	0	6	0	0	0	10	16	0	0	0	8	0	8	4	12	20	18
12:30 12:45	0	4	0	4	0	0	0	4	8	0	0	0	7	0	7	0	7	14	11
12:45 13:00	0	4	0	4	0	0	0	5	9	0	0	0	2	0	2	1	3	5	7
13:00 13:15	0	4	0	4	0	0	0	6	10	0	0	0	5	0	5	2	7	12	11
13:15 13:30	2	1	0	3	0	0	0	3	6	0	0	0	5	0	3	2	5	10	8
15:00 15:15	1	1	0	2	0	0	0	10	12	0	0	0	8	0	7	9	16	24	18
15:15 15:30	0	2	0	2	0	0	0	10	12	0	0	0	4	0	4	8	12	16	14
15:30 15:45	0	4	0	4	0	0	0	12	16	0	0	0	7	0	7	8	15	22	19
15:45 16:00	0	5	0	5	0	0	0	6	11	0	0	0	5	0	5	1	6	11	11
16:00 16:15	1	6	0	7	0	0	0	13	20	0	0	0	2	0	1	7	8	10	15
16:15 16:30	0	2	0	2	0	0	0	3	5	0	0	0	7	0	7	1	8	15	10
16:30 16:45	0	2	0	2	0	0	0	5	7	0	0	0	3	0	3	3	6	9	8
16:45 17:00	2	3	0	5	0	0	0	3	8	0	0	0	4	0	2	0	2	6	7
17:00 17:15	0	4	0	4	0	0	0	7	11	0	0	0	1	0	1	3	4	5	8
17:15 17:30	0	4	0	4	0	0	0	4	8	0	0	0	2	0	2	0	2	4	6
17:30 17:45	0	3	0	3	0	0	0	4	7	0	0	0	2	0	2	1	3	5	6
17:45 18:00	0	3	0	3	0	0	0	4	7	0	0	0	1	0	1	1	2	3	5
Total: None	8	114	0	122	0	0	0	193	315	0	0	0	159	0	151	79	230	389	352

640	1.17	Trans	portation	Services -	Traffic S	ervices	
Jua	wu	т	urning Mov	ement Cou	nt - Study I	Results	
				ERINE ST (			
urvey Da	te: Wedne	esday, April	18, 2018		wo	) No:	40741
Start Time	e: 07:00				De	vice:	Miovision
			Eull S	tudy 15 Mir			WHO VIOIOII
			KENT S	51	CAI	HERINE ST	
_	Time	Period	Northbound U-Turn Total	Southbound U-Turn Total	Eastbound U-Turn Total	Westbound U-Turn Total	Total
	07:00	07:15	0	0	0	0	0
	07:15	07:30	0	0	0	0	0
	07:30	07:45	0	0	0	0	0
	07:45	08:00	0	0	0	0	0
	08:00	08:15	0	0	0	0	0
_	08:15	08:30	0	0	0	0	0
_	08:30	08:45	0	0	0	0	0
_	08:45	09:00	0	0	0	0	0
	09:00	09:15	0	0	0	0	0
	09:15	09:30	0	0	0	0	0
_	09:30	09:45	0	0	0	0	0
	09:45	10:00 11:45	0	0	0	0	0
	11:45	11:45	0	0	0	0	0
	12:00	12:00	0	0	0	0	0
	12:00	12:13	0	0	0	0	0
_	12:30	12:30	0	0	0	0	0
	12:30	12:43	0	0	0	0	0
	13:00	13:15	0	0	0	0	0
-	13:15	13:30	0	0	0	0	0
-	15:00	15:15	0	0	0	0	0
	15:15	15:30	0	0	0	0	0
_	15:30	15:45	0	0	0	0	0
_	15:45	16:00	0	0	0	0	0
	16:00	16:15	0	0	0	0	0
	16:15	16:30	0	0	0	0	0
_	16:30	16:45	0	0	0	0	0
	16:45	17:00	0	0	0	0	0
	17:00	17:15	0	0	0	0	0
	17:15	17:30	0	0	0	0	0
	17:30	17:45	0	0	0	0	0
	17:45	18:00	0	0	0	0	0
	Te	ətal	0	0	0	0	0



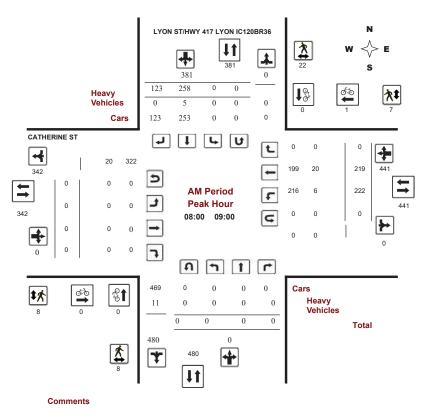
#### Turning Movement Count - Study Results CATHERINE ST @ LYON ST/HWY 417 LYON IC120BR36

Survey Date: Wednesday, April 18, 20	18	WO No:	40740
Start Time: 07:00	Full Study Diagram	Device:	Miovision
Total Heavy Vehicles Cars	LYON ST/HWY 417 LYON IC120BR36           Image: state		$ \begin{array}{c} N\\ W \swarrow E\\ S\\ \overset{\bullet}{G} \overset{\bullet}{\overset{\bullet}{G}} \overset{\bullet}{\overset{\bullet}{H}} \overset{\bullet}{\overset{\bullet}{H}} \\ \overset{\bullet}{H} \overset{\bullet}{\overset{\bullet}{H}} \overset{\bullet}{\overset{\bullet}{H}} \overset{\bullet}{\overset{\bullet}{H}} \\ \overset{\bullet}{H} \overset{\bullet}{\overset{\bullet}{H}} \overset{\bullet}$
CATHERINE ST       447       3475       0       0       3475       0		2039 119	0 2158 1572 0 0 0 0 0 0 0
$ \begin{array}{c}                                     $	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	- Vehicles	s Total



## Transportation Services - Traffic Services Turning Movement Count - Peak Hour Diagram CATHERINE ST @ LYON ST/HWY 417 LYON IC120BR36

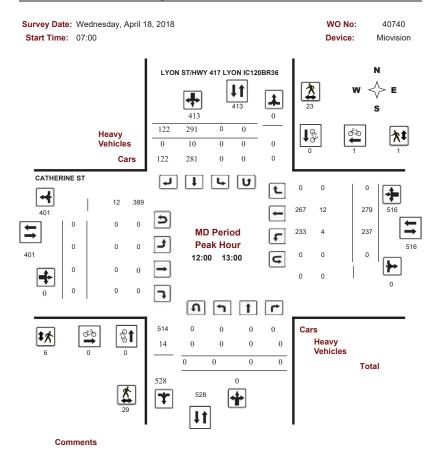
Survey Date: Wednesday, April 18, 2018 Start Time: 07:00 WO No: 40740 Device: Miovision



Page 2 of 8

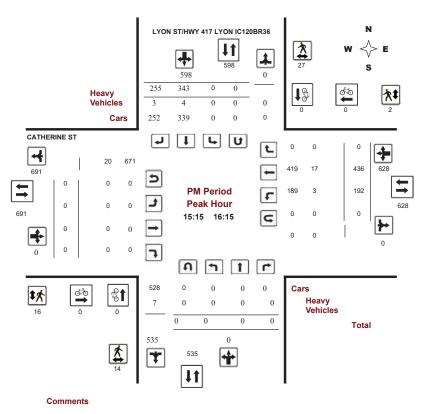
2023-Jan-13

#### Turning Movement Count - Peak Hour Diagram CATHERINE ST @ LYON ST/HWY 417 LYON IC120BR36



## Transportation Services - Traffic Services <u>Turning Movement Count - Peak Hour Diagram</u> CATHERINE ST @ LYON ST/HWY 417 LYON IC120BR36

Survey Date: Wednesday, April 18, 2018 Start Time: 07:00 WO No: 40740 Device: Miovision



2023-Jan-13

2023-Jan-13



#### **Turning Movement Count - Study Results**

#### CATHERINE ST @ LYON ST/HWY 417 LYON IC120BR36

Start Tim	<b>ie:</b> 07	7:00										Devi	ce:			Miov	vision		
				F	ull S	Stud	y Sı	umma	ary (8	HR	Sta	ndar	d)						
urvey Da	te: V	Vedne	esday,	April 1	8, 20	18		1	Total O	bserv	ed U-	Turns					AAD	Facto	or
							١	Vorthbour	nd: 0		South	nbound:	0				.90		
								Eastbour	nd: 0		West	bound:	0						
	LYO	N ST/	HWY (	417 LY	'ON IC	C120BI	R36					CATH	IERII	VE ST					
	Nor	thbou	nd		So	uthbou	und			E	astbou	Ind		W	/estbou	und			
Period	LT	ST	RT	NB TOT	LT	ST	RT	SB TOT	STR TOT	LT	ST	RT	EB TOT	LT	ST	RT	WB TOT	STR TOT	Gra
7:00 08:00	0	0	0	0	0	223	94	317	317	0	0	0	0	150	192	0	342	342	
8:00 09:00	0	0	0	0	0	258	123	381	381	0	0	0	0	222	219	0	441	441	
9:00 10:00	0	0	0	0	0	213	108	321	321	0	0	0	0	183	244	0	427	427	
:30 12:30	0	0	0	0	0	279	122	401	401	0	0	0	0	236	265	0	501	501	
2:30 13:30	0	0	0	0	0	267	110	377	377	0	0	0	0	241	269	0	510	510	
:00 16:00	0	0	0	0	0	402	213	615	615	0	0	0	0	200	407	0	607	607	1
:00 17:00	0	0	0	0	0	297	301	598	598	0	0	0	0	169	344	0	513	513	
:00 18:00	0	0	0	0	0	366	246	612	612	0	0	0	0	171	218	0	389	389	
Sub Total	0	0	0	0	0	2305	1317	3622	3622	0	0	0	0	1572	2158	0	3730	3730	1
U Turns				0				0	0				0				0	0	
Total	0	0	0	0	0	2305	1317	3622	3622	0	0	0	0	1572	2158	0	3730	3730	1
<b>EQ 12Hr</b> ite: These v	0 alues an	0 e colcui	0 Iated by	0 ( multiply	0 ving the	3204	1831	5035	5035	0 on fact	0	0	0	2185 <b>1.39</b>	3000	0	5185	5185	10
VG 12Hr	0	0	0	0	0	3777	2158	4532	4532	0	0	0	0	1966	2700	0	4666	4666	
te: These v	-	-	-	-	•					-	-	5	5	.90	2.00	5			
VG 24Hr	0	0	0	0	0	4948	2827	5937	5937	0	0	0	0	2575	3537	0	6112	6112	1
te: These v														1.31					

Cottawa Transpo

**Transportation Services - Traffic Services** 

## Turning Movement Count - Study Results CATHERINE ST @ LYON ST/HWY 417 LYON IC120BR36

Survey				esday,	April	18, 20	018							wo	No:			4	0740	
Start T	ime:	07	2:00											Dev	ice:			Mie	ovision	
							F	ull S	tud	v 15	5 Mii	nute	e Inc	rem	ents	5				
			LYO	N ST/I	HWY	417 L	YON						CAT	HERIN	IE ST					
				IC1	20BF	236														
		No	orthbo	und		So	outhbou	nd			E	astbour	nd		We	estbour	nd			
Time Per	iod	LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
	:15	0	0	0	0	0	44	20	64	64	0	0	0	0	37	51	0	88	88	152
	:30	0	0	0	0	0	58	19	77	77	0	0	0	0	24	38	0	62	62	139
	:45	0	0	0	0	0	64	30	94	94	0	0	0	0	45	50	0	95	95	189
	:00	0	0	0	0	0	57	25	82	82	0	0	0	0	44	53	0	97	97	179
	:15	0	0	0	0	0	62	27	89	89	0	0	0	0	57	57	0	114	114	203
	:30	0	0	0	0	0	66	29	95	95	0	0	0	0	59	53	0	112	112	207
	:45	0	0	0	0	0	74	38	112	112	0	0	0	0	56	57	0	113	113	225
	:00	0	0	0	0	0	56	29	85	85	0	0	0	0	50	52	0	102	102	187
	:15	0	0	0	0	0	57	34	91	91	0	0	0	0	46	56	0	102	102	193
	:30	0	0	0	0	0	61	28	89	89	0	0	0	0	53	56	0	109	109	198
	:45	0	0	0	0	0	64	26	90	90	0	0	0	0	50	61	0	111	111	201
	:00	0	0	0	0	0	31	20	51	51	0	0	0	0	34	71	0	105	105	156
	:45	0	0	0	0	0	56	31	87	87	0	0	0	0	62	74	0	136	136	223
	:00	0	0	0	0	0	68	28	96	96	0	0	0	0	53	58	0	111	111	207
	:15	0	0	0	0	0	73	31	104	104	0	0	0	0	53	72	0	125	125	229
	:30	0	0	0	0	0	82	32	114	114	0	0	0	0	68	61	0	129	129	243
	:45	0	0	0	0	0	65	29	94	94	0	0	0	0	54	72	0	126	126	220
	:00	0	0	0	0	0	71	30	101	101	0	0	0	0	62	74	0	136	136	237
	:15	0	0	0	0	0	80	25	105	105	0	0	0	0	62	51	0	113	113	218
	:30	0	0	0	0	0	51	26	77	77	0	0	0	0	63	72	0	135	135	212
	:15	0	0	0	0	0	132 100	47 62	179 162	179 162	0	0	0	0	61 50	72 114	0	133 164	133 164	312 326
	:30	0	0	0	0	0	92	-	-			-	0	0	50 43	_	0			
	:45	0	0	0	0	0	92 78	52 52	144 130	144 130	0	0	0	0	43	131 90	0	174 136	174 136	318 266
	:15	0	0	0	0	0	78	52 89	162	162	0	0	0	0	46 53	90 101	0	156	154	200
	:30	0	0	0	0	0	88	76	164	164	0	0	0	0	46	115	0	161	161	325
	:45	0	0	0	0	0	69	62	131	131	0	0	0	0	36	63	0	99	99	230
	:00	0	0	0	0	0	67	74	141	141	0	0	0	0	30	65	0	99	99	230
	:15	0	0	0	0	0	93	74	141	141	0	0	0	0	48	57	0	99 105	105	240
	:30	0	0	0	0	0	110	60	170	170	0	0	0	0	50	61	0	103	111	273
	:45	0	0	0	0	0	84	68	152	152	0	0	0	0	35	52	0	87	87	239
	:00	0	0	0	0	0	79	41	120	120	0	0	0	0	38	48	0	86	86	205
Total:		0	0	0	0	0	2305	1317	3622	3622	0	0	0	0	1572	2158	0	3730	3730	7.352

Note: U-Turns are included in Totals.



#### **Turning Movement Count - Study Results**

#### CATHERINE ST @ LYON ST/HWY 417 LYON IC120BR36

Survey Dat	te: Wednesda	y, April 18, 2018	1		WO No:		40740
Start Time	07:00				Device:	I	Viovision
			Full Study	Cyclist Ve			
	LYON ST/H	HWY 417 LYON	IC120BR36		CATHERINE S	т	
Time Period	Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	Grand Total
07:00 07:15	0	0	0	0	0	0	0
07:15 07:30	0	0	0	0	0	0	0
07:30 07:45	0	0	0	0	0	0	0
07:45 08:00	0	0	0	0	0	0	0
08:00 08:15	0	0	0	0	0	0	0
08:15 08:30	0	0	0	0	1	1	1
08:30 08:45	0	0	0	0	0	0	0
08:45 09:00	0	0	0	0	0	0	0
09:00 09:15	0	0	0	0	0	0	0
09:15 09:30	0	0	0	0	1	1	1
09:30 09:45	0	0	0	0	0	0	0
09:45 10:00	0	0	0	0	0	0	0
11:30 11:45	0	1	1	0	0	0	1
11:45 12:00	0	1	1	0	0	0	1
12:00 12:15	0	0	0	0	0	0	0
12:15 12:30	0	0	0	0	1	1	1
12:30 12:45	0	0	0	0	0	0	0
12:45 13:00	0	0	0	0	0	0	0
13:00 13:15	0	0	0	0	0	0	0
13:15 13:30	0	0	0	0	0	0	0
15:00 15:15	0	0	0	0	0	0	0
15:15 15:30	0	0	0	0	0	0	0
15:30 15:45	0	0	0	0	0	0	0
15:45 16:00	0	0	0	0	0	0	0
16:00 16:15	0	0	0	0	0	0	0
16:15 16:30	0	0	0	0	2	2	2
16:30 16:45	0	0	0	0	1	1	1
16:45 17:00	0	0	0	1	0	1	1
17:00 17:15	0	0	0	0	0	0	0
17:15 17:30	0	0	0	0	0	0	0
17:30 17:45	0	1	1	0	0	0	1
17:45 18:00	0	1	1	0	0	0	1
Total	0	4	4	1	6	7	11



#### **Transportation Services - Traffic Services**

#### **Turning Movement Count - Study Results**

#### CATHERINE ST @ LYON ST/HWY 417 LYON IC120BR36

Survey Da	te: Wednesda	y, April 18, 2018			WO No:		40740
Start Time	e: 07:00				Device:		Miovision
		F	ull Stud	dy Pedestria	n Volume		
	LY	ON ST/HWY 417		,	CATHERINE ST		
Time Period	NB Approach (E or W Crossing)	SB Approach (E or W Crossing)	Total	EB Approach (N or S Crossing)	WB Approach (N or S Crossing)	Total	Grand Total
07:00 07:15	1	4	5	0	0	0	5
07:15 07:30	0	0	0	1	0	1	1
07:30 07:45	1	3	4	0	0	0	4
07:45 08:00	1	3	4	0	0	0	4
08:00 08:15	1	8	9	0	3	3	12
08:15 08:30	2	5	7	3	1	4	11
08:30 08:45	4	2	6	4	1	5	11
08:45 09:00	1	7	8	1	2	3	11
09:00 09:15	3	6	9	1	1	2	11
09:15 09:30	1	1	2	0	0	0	2
09:30 09:45	7	2	9	5	0	5	14
09:45 10:00	8	2	10	2	0	2	12
11:30 11:45	6	2	8	0	2	2	10
11:45 12:00	5	7	12	0	1	1	13
12:00 12:15	14	7	21	3	0	3	24
12:15 12:30	5	6	11	1	1	2	13
12:30 12:45	7	5	12	1	0	1	13
12:45 13:00	3	5	8	1	0	1	9
13:00 13:15	1	4	5	4	1	5	10
13:15 13:30	7	7	14	3	2	5	19
15:00 15:15	9	11	20	6	0	6	26
15:15 15:30	4	6	10	5	1	6	16
15:30 15:45	0	11	11	6	1	7	18
15:45 16:00	7	5	12	3	0	3	15
16:00 16:15	3	5	8	2	0	2	10
16:15 16:30	4	6	10	5	2	7	17
16:30 16:45	1	1	2	1	0	1	3
16:45 17:00	3	3	6	3	0	3	9
17:00 17:15	3	9	12	4	0	4	16
17:15 17:30	1	7	8	2	0	2	10
17:30 17:45	1	2	3	0	0	0	3
17:45 18:00	1	1	2	0	0	0	2
Total	115	153	268	67	19	86	354
i viai	110	100	200	07	10	00	354

6		
MC .	Ittawa	

#### Turning Movement Count - Study Results

#### CATHERINE ST @ LYON ST/HWY 417 LYON IC120BR36

Survey Dat	te: W	Wednesday, April 18, 2018 WO No:											4	0740					
Start Time	e: 07	7:00											Dev	ice:			Mie	ovisio	n
						F	ull S	tud		avy	۷۵ł	nicle	20						
		1.00	N ST/		4471			luu	yiie	avy	VCI		HERIN	IE OT					
		LIU		20BF								CAI		12 31					
	N	orthbo				outhbou	Ind			Е	astbour	nd		W	estbour	nd			
Time Period		ST	RT	Ν	LT	ST	RT	s	STR	LT	ST	RT	Е	LT	ST	RT	w	STR	Grand
	LT			тот				TOT	тот				тот				тот	тот	Total
07:00 07:15	0	0	0	8	0	4	0	4	12	0	0	0	9	4	9	0	13	22	17
07:15 07:30	0	0	0	7	0	5	0	5	12	0	0	0	3	2	3	0	5	8	10
07:30 07:45	0	0	0	3	0	2	0	2	5	0	0	0	3	1	3	0	4	7	6
07:45 08:00	0	0	0	0	0	0	0	0	0	0	0	0	5	0	5	0	5	10	5
08:00 08:15	0	0	0	4	0	0	0	0	4	0	0	0	7	4	7	0	11	18	11
08:15 08:30	0	0	0	2	0	1	0	1	3	0	0	0	5	1	5	0	6	11	7
08:30 08:45	0	0	0	3	0	2	0	2	5	0	0	0	4	1	4	0	5	9	7
08:45 09:00	0	0	0	2	0	2	0	2	4	0	0	0	4	0	4	0	4	8	6
09:00 09:15	0	0	0	1	0	0	0	0	1	0	0	0	3	1	3	0	4	7	4
09:15 09:30	0	0	0	5	0	0	0	0	5	0	0	0	4	5	4	0	9	13	9
09:30 09:45	0	0	0	5	0	3	0	-	8	0	0	0	2	2	2	0	4	6	
09:45 10:00	0	0	0	1	0	1	0	1	2	0	0	0	6	0	6	0	6	12 7	7
11:30 11:45	0	-	÷		-	-	2	2	3 10	-	0	-		1	_	0	-		5
11:45 12:00	0	0	0	6 2	0	3	1	4	10	0	0	0	6	3	5	-	8	14 8	12
12:00 12:15	-	0	0		0	2		2		0	0	0			4	0		8	9
12:15 12:30 12:30 12:45	0	0	0	5	0	4	0	4	9 4	0	0	0	4	1	4	0	5	9	9
12:30 12:45	0	0	0	4	0	3	0	3	4	0	0	0	4	2	4	0	1	10	4
13:00 13:15	0	0	0	4	0	3	0	3	4	0	0	0	3	2	3	0	5	8	6
13:15 13:30	0	0	0	3	0	0	1	1	4	0	0	0	3	2	2	0	3	6 6	4
15:00 15:15	0	0	0	5	0	1	0	1	6	0	0	0	6	4	6	0	3 10	16	4
15:15 15:30	0	0	0	2	0	1	0	1	3	0	0	0	2	4	2	0	3	5	4
15:30 15:45	0	0	0	3	0	1	1	2	5	0	0	0	6	2	5	0	7	13	9
15:45 16:00	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4	0	4	8	4
16:00 16:15	0	0	0	2	0	2	2	4	6	0	0	0	8	0	6	0	6	14	10
16:15 16:30	0	0	0	2	0	0	0	0	2	0	0	0	6	2	6	0	8	14	8
16:30 16:45	0	0	0	1	0	0	0	0	1	0	0	0	2	1	2	0	3	5	3
16:45 17:00	0	0	0	1	0	1	0	1	2	0	0	0	4	0	4	0	4	8	5
17:00 17:15	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	0	2	4	2
17:15 17:30	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	1	2	1
17:30 17:45	0	0	0	2	0	0	0	0	2	0	0	0	2	2	2	0	4	6	4
17:45 18:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total: None	0	0	0	84	0	40	7	47	131	0	0	0	126	44	119	0	163	289	210

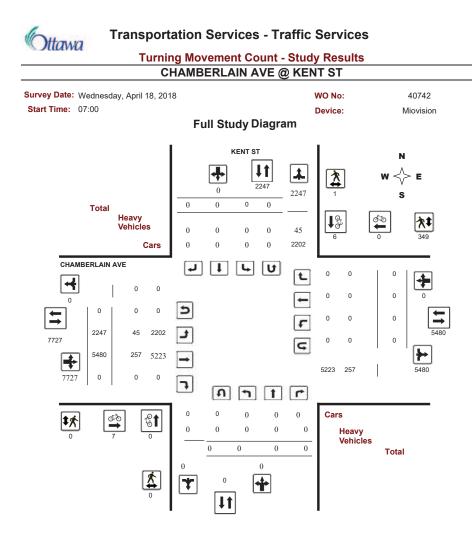


#### **Transportation Services - Traffic Services**

**Turning Movement Count - Study Results** 

#### CATHERINE ST @ LYON ST/HWY 417 LYON IC120BR36

ate: Wedne	sday, April	18, 2018		wo	O No:	40740
ne: 07:00				De	vice:	Miovision
		Full S	tudy 15 Mir	nute U-Turr	n Total	
		LYON ST/HWY	417 LYON		HERINE ST	
Time I	Period	IC120BR Northbound U-Turn Total	36 Southbound U-Turn Total	Eastbound U-Turn Total	Westbound U-Turn Total	Total
07:00	07:15	0	0	0	0	0
07:15	07:30	0	0	0	0	0
07:30	07:45	0	0	0	0	0
07:45	08:00	0	0	0	0	0
08:00	08:15	0	0	0	0	0
08:15	08:30	0	0	0	0	0
08:30	08:45	0	0	0	0	0
08:45	09:00	0	0	0	0	0
09:00	09:15	0	0	0	0	0
09:15	09:30	0	0	0	0	0
09:30	09:45	0	0	0	0	0
09:45	10:00	0	0	0	0	0
11:30	11:45	0	0	0	0	0
11:45	12:00	0	0	0	0	0
12:00	12:15	0	0	0	0	0
12:15	12:30	0	0	0	0	0
12:30	12:45	0	0	0	0	0
12:45	13:00	0	0	0	0	0
13:00	13:15	0	0	0	0	0
13:15	13:30	0	0	0	0	0
15:00	15:15	0	0	0	0	0
15:15	15:30	0	0	0	0	0
15:30	15:45	0	0	0	0	0
15:45	16:00	0	0	0	0	0
16:00	16:15	0	0	0	0	0
16:15	16:30	0	0	0	0	0
16:30	16:45	0	0	0	0	0
16:45	17:00	0	0	0	0	0
17:00	17:15	0	0	0	0	0
17:15	17:30	0	0	0	0	0
17:30	17:45	0	0	0	0	0
17:45	18:00	0	0	0	0	0
	otal	0	0	0	0	0



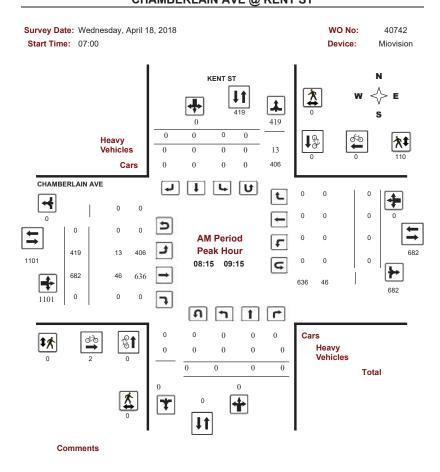


Turning Movement Count - Study Results CHAMBERLAIN AVE @ KENT ST

rvey Date: Wednesday, A art Time: 07:00	April 18, 201	8			WO No: Device:	40742 Miovision
		Full St	udy Peak Hou	r Diag	ram	
	1		KENT ST		1	N
				<b>4</b> 19	<u>گ</u>	W 🔶 E S
Total H Vo	eavy ehicles Cars	0 0 0	0 0 0 0 0 0 0 0 0	13 406		
CHAMBERLAIN AVE	0 0	L	I L U	L	0 0	0
	0 0	5	Full Study Peak Hour:	-	0 0	
419 1101 682	<ul><li>13 406</li><li>46 636</li></ul>		08:15 09:15	¢	0 0 636 46	
1101 0	0 0	7	<u>ח</u> ד	۴		I 682
	<b>₽</b> 0	0	0         0         0           0         0         0         0           0         0         0         0	0 0 0	Cars Heavy Vehicl	
	<u>ر</u>	0 •	0 • • • • • • • • • • • • • • • • • • •			



#### **Turning Movement Count - Peak Hour Diagram** CHAMBERLAIN AVE @ KENT ST



Ottawa **Turning Movement Count - Peak Hour Diagram** CHAMBERLAIN AVE @ KENT ST Survey Date: Wednesday, April 18, 2018 WO No: 40742 Start Time: 07:00 Device: Miovision Ν KENT ST **I**t \* <} E w ♣ \* 201 0 s 0 201 0 0 0 0 18 ¢⊅ ♦ Heavy **₹** Vehicles 0 0 0 0 9 15 Cars 0 0 0 192 0 CHAMBERLAIN AVE **L** Ŧ. 4 10 0 0 0 t 4 4 0 0 0 0 0 0 -0 5 0 0 11 0 t t **MD Period** 0 0 0 F t Peak Hour 723 201 9 192 924 G 0 0 0 11:45 12:45 ₩ 723 25 -----698 + 698 25 723 0 0 0 ٦ 924 A 1 1 1 0 0 0 0 0 Cars ₫ 81 **\$** Heavy 0 0 0 0 0 Vehicles 0 0 0 0 0 0 Total 0 \* + \* 0 **I**t

**Transportation Services - Traffic Services** 

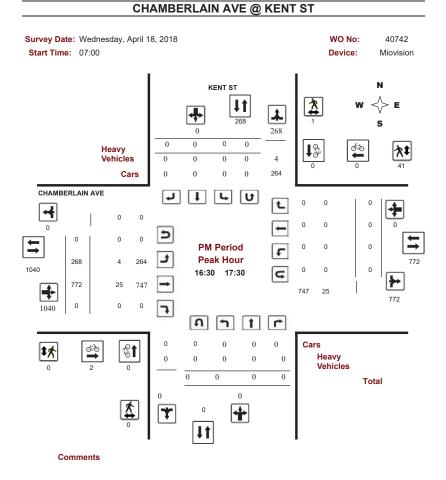
Comments

2023-Jan-13

2023-Jan-13



Turning Movement Count - Peak Hour Diagram



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	ttawa

**Transportation Services - Traffic Services** 

					Cł	IAM	BEF	RLAI	N A	/E @	) KE	NT	ST						
Survey Da	te: w	ednes	day, <i>i</i>	April 1	8, 2018	В						wo	No:			40	742		
Start Tim	e: 07	7:00											vice:			Miov	ision/		
							y Su	mma											
Survey Dat	te: V	Vedne	sday,	April 1	18, 201	8				bser	ved U-							T Facto	or
								orthbour Eastbour	0			ibound bound	0				.90		
			ĸ	ENT S	т			asuboun	iu. ()				0	AIN AV	F				
	Nor	thbour				uthbou	nd	_		F	astbou				estbou	ind			
Period	LT	ST	RT	NB TOT	LT	ST	RT	SB TOT	STR TOT	LT	ST	RT	EB TOT	LT	ST	RT	WB TOT	STR TOT	Gran Tota
07:00 08:00	0	0	0	0	0	0	0	0	0	346	537	0	883	0	0	0	0	883	88
08:00 09:00	0	0	0	0	0	0	0	0	0	438	652	0	1090	0	0	0	0	1090	109
09:00 10:00	0	0	0	0	0	0	0	0	0	291	656	0	947	0	0	0	0	947	94
11:30 12:30	0	0	0	0	0	0	0	0	0	196	716	0	912	0	0	0	0	912	91
12:30 13:30	0	0	0	0	0	0	0	0	0	197	714	0	911	0	0	0	0	911	91
15:00 16:00	0	0	0	0	0	0	0	0	0	255	761	0	1016	0	0	0	0	1016	101
16:00 17:00	0	0	0	0	0	0	0	0	0	265	686	0	951	0	0	0	0	951	95
17:00 18:00	0	0	0	0	0	0	0	0	0	259	758	0	1017	0	0	0	0	1017	101
Sub Total	0	0	0	0	0	0	0	0	0	2247	5480	0	7727	0	0	0	0	7727	772
U Turns				0				0	0				0				0	0	1
Total	0	0	0	0	0	0	0	0	0	2247	5480	0	7727	0	0	0	0	7727	772
EQ 12Hr	0	0	0	0	0	0	0	0	0	3123	7617	0	10741	0 1.39	0	0	0	10741	1074
lote: These va					-														
AVG 12Hr lote: These vo	0 olumes a	0 are calc	0 ulated	0 by multip	0 olying th	0 e Equiv	0 alent 12	0 2 hr. total	0 Is by the		6855 factor.	0	9667	0 . <b>90</b>	0	0	0	9667	966
AVG 24Hr	0	0	0	0	0	0	0	0	0	3682	8980	0	12664	0	0	0	0	12664	1266

Note: U-Turns provided for approach totals. Refer to 'U-Turn' Report for specific breakdown.

Otto			Tra	ans	роі	tati	on	Ser	vic	es -	Tra	affic	: Se	rvio	ces				
	wu			Т									dy R		lts				
					(	СНА	MB	ERL	AIN	AV	E @	KE	NT S	ST					
Survey Dat	te: W	/edne	sday,	April	18, 20	018							wo	No:			4	0742	
Start Time	: 07	7:00											Dev	ice:			Mi	ovisior	1
						E	ull S	tud	v 1	5 Mi	nute	Inc	rem	ent	6				
			к	ENTS	эт			luu	,				BERL/						
	N	orthbo	und		S	outhbou	und			E	astbour				- — estbour	nd			
Time Period	LT	ST	RT	N TOT	LT	ST	RT	s тот	STR TOT	LT	ST	RT	Е ТОТ	LT	ST	RT	w тот	STR TOT	Grand Total
07:00 07:15	0	0	0	0	0	0	0	0	0	64	103	0	167	0	0	0	0	167	167
07:15 07:30 07:30 07:45	0	0	0	0	0	0	0	0	0	82 86	146 137	0	228 223	0	0	0	0	228 223	228 223
07:45 08:00	0	0	0	0	0	0	0	0	0	114	157	0	223	0	0	0	0	223	223
08:00 08:15	0	0	0	0	0	0	0	0	0	109	147	0	256	0	0	0	0	256	256
08:15 08:30	0	0	0	0	0	0	0	0	0	99	163	0	262	0	0	0	0	262	262
08:30 08:45	0	0	0	0	0	0	0	0	0	126	150	0	276	0	0	0	0	276	276
08:45 09:00	0	0	0	0	0	0	0	0	0	104	192	0	296	0	0	0	0	296	296
09:00 09:15	0	0	0	0	0	0	0	0	0	90	177	0	267	0	0	0	0	267	267
09:15 09:30 09:30 09:45	0	0	0	0	0	0	0	0	0	73 61	172 151	0	245 212	0	0	0	0	245 212	245 212
09:45 10:00	0	0	0	0	0	0	0	0	0	67	151	0	212	0	0	0	0	212	212
11:30 11:45	0	0	0	0	0	0	0	0	0	47	171	0	218	0	0	0	0	218	218
11:45 12:00	0	0	0	0	0	0	0	0	0	56	182	0	238	0	0	0	0	238	238
12:00 12:15	0	0	0	0	0	0	0	0	0	41	195	0	236	0	0	0	0	236	236
12:15 12:30	0	0	0	0	0	0	0	0	0	52	168	0	220	0	0	0	0	220	220
12:30 12:45	0	0	0	0	0	0	0	0	0	52	178	0	230	0	0	0	0	230	230
12:45 13:00 13:00 13:15	0	0	0	0	0	0	0	0	0	46 46	171 194	0	217 240	0	0	0	0	217 240	217 240
13:15 13:30	0	0	0	0	0	0	0	0	0	53	171	0	2240	0	0	0	0	240	240
15:00 15:15	0	0	0	0	0	0	0	0	0	73	178	0	251	0	0	0	0	251	251
15:15 15:30	0	0	0	0	0	0	0	0	0	56	199	0	255	0	0	0	0	255	255
15:30 15:45	0	0	0	0	0	0	0	0	0	64	204	0	268	0	0	0	0	268	268
15:45 16:00	0	0	0	0	0	0	0	0	0	62	180	0	242	0	0	0	0	242	242
16:00 16:15	0	0	0	0	0	0	0	0	0	62 75	168 154	0	230 229	0	0	0	0	230 229	230 229
16:15 16:30 16:30 16:45	0	0	0	0	0	0	0	0	0	75 65	154 187	0	229	0	0	0	0	229	229
16:45 17:00	0	0	0	0	0	0	0	0	0	63	107	0	232	0	0	0	0	232	232
17:00 17:15	0	0	0	0	0	0	0	0	0	65	222	0	287	0	0	0	0	287	287
17:15 17:30	0	0	0	0	0	0	0	0	0	75	186	0	261	0	0	0	0	261	261
17:30 17:45	0	0	0	0	0	0	0	0	0	56	177	0	233	0	0	0	0	233	233
17:45 18:00	0	0	0	0	0	0	0	0	0	63	173	0	236	0	0	0	0	236	236
Total:	0	0	0	0	0	0	0	0	0	2247	5480	0	7727	0	0	0	0	7727	7,727

Note: U-Turns are included in Totals.



#### **Transportation Services - Traffic Services**

#### Turning Movement Count - Study Results CHAMBERLAIN AVE @ KENT ST

Start Time		y, April 18, 201					
Start Time	a: 07.00				Device:		Miovision
			Full Study				
		KENT ST		С	HAMBERLAIN	AVE	
Time Period	Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	Grand Total
07:00 07:15	0	0	0	0	0	0	0
07:15 07:30	0	0	0	0	0	0	0
07:30 07:45	0	0	0	0	0	0	0
07:45 08:00	0	0	0	0	0	0	0
08:00 08:15	0	0	0	0	0	0	0
08:15 08:30	0	0	0	1	0	1	1
08:30 08:45	0	0	0	1	0	1	1
08:45 09:00	0	0	0	0	0	0	0
09:00 09:15	0	0	0	0	0	0	0
09:15 09:30	0	0	0	0	0	0	0
09:30 09:45	0	0	0	0	0	0	0
09:45 10:00	0	0	0	0	0	0	0
11:30 11:45	0	0	0	0	0	0	0
11:45 12:00	0	0	0	0	0	0	0
12:00 12:15	0	0	0	0	0	0	0
12:15 12:30	0	0	0	0	0	0	0
12:30 12:45	0	1	1	1	0	1	2
12:45 13:00	0	0	0	0	0	0	0
13:00 13:15	0	1	1	0	0	0	1
13:15 13:30	0	0	0	0	0	0	0
15:00 15:15	0	0	0	1	0	1	1
15:15 15:30	0	3	3	0	0	0	3
15:30 15:45	0	0	0	0	0	0	0
15:45 16:00	0	0	0	0	0	0	0
16:00 16:15	0	0	0	0	0	0	0
16:15 16:30	0	1	1	1	0	1	2
16:30 16:45	0	0	0	2	0	2	2
16:45 17:00	0	0	0	0	0	0	0
17:00 17:15	0	0	0	0	0	0	0
17:15 17:30	0	0	0	0	0	0	0
17:30 17:45	0	0	0	0	0	0	0
17:45 18:00	0	0	0	0	0	0	0
Total	0	6	6	7	0	7	13

Ottaw	a	anoportat		vices - Tra			
				ent Count - S		ts	
		CHA	MBERL	AIN AVE @	KENT ST		
Survey Date:	Wednesda	y, April 18, 2018			WO No:		40742
Start Time:	07:00				Device:		Miovision
		F	ull Stud	y Pedestriar	Volume		
		KENT ST			HAMBERLAIN AV		
		KENT ST				-	
	NB Approach or W Crossing)	SB Approach (E or W Crossing)	Total	EB Approach (N or S Crossing)	WB Approach (N or S Crossing)	Total	Grand Total
07:00 07:15	0	0	0	0	4	4	4
07:15 07:30	0	0	0	0	3	3	3
07:30 07:45	0	0	0	0	9	9	9
07:45 08:00	0	0	0	0	12	12	12
08:00 08:15 08:15 08:30	0	0	0	0	12	12	12
08:15 08:30	0	0	0	0	21 65	21 65	21
08:45 09:00	0	0	0	0	16	16	65
09:00 09:15	0	0	0	0	8	8	8
09:15 09:30	0	0	0	0	3	3	3
09:30 09:45	0	0	0	0	4	4	4
09:45 10:00	0	0	0	0	4	4	4
11:30 11:45	0	0	0	0	5	5	5
11:45 12:00	0	0	0	0	1	1	1
12:00 12:15	0	0	0	0	8	8	8
12:15 12:30	0	0	0	0	4	4	4
12:30 12:45	0	0	0	0	2	2	2
12:45 13:00	0	0	0	0	2	2	2
13:00 13:15	0	0	0	0	4	4	4
13:15 13:30	0	0	0	0	4	4	4
15:00 15:15	0	0	0	0	6	6	6
15:15 15:30	0	0	0	0	58	58	58
15:30 15:45	0	0	0	0	11	11	11
15:45 16:00	0	0	0	0	4	4	4
16:00 16:15	0	0	0	0	14	14	14
16:15 16:30 16:30 16:45	0	0	0	0	7 8	7	7
16:30 16:45 16:45 17:00	0	0	0	0	10	8	8 10
16:45 17:00	0	1	1	0	9	10	10
17:00 17:15	0	0	0	0	9	9	10
17:15 17:30	0	0	0	0	8	8	8
17:45 18:00	0	0	0	0	9	9	9
Total	0	1	1	0	349	349	350



#### Turning Movement Count - Study Results CHAMBERLAIN AVE @ KENT ST

Survey D Start Tir			suay,	дри	10, 20	510							WO					0742	
Start III	ne. (	00.11				-							Dev	ice:			MI	ovisior	1
						F	ullS	tud	у Не	eavy									
			KI	ENT S	SТ						C	HAME	BERLA	IN A	٧E				
	1	Vorthbo	und		So	outhbou	ind			E	astbour	nd		We	estbour	nd			
Time Perio	d LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	Е ТОТ	LT	ST	RT	W тот	STR TOT	Grand Total
07:00 07:1	5 0	0	0	0	0	0	0	1	1	1	6	0	7	0	0	0	6	13	7
07:15 07:3	0 0	0	0	0	0	0	0	0	0	0	7	0	7	0	0	0	7	14	7
07:30 07:4	5 0	0	0	0	0	0	0	0	0	0	6	0	6	0	0	0	6	12	6
07:45 08:0	0 0	0	0	0	0	0	0	0	0	0	5	0	5	0	0	0	5	10	5
08:00 08:1	5 0	0	0	0	0	0	0	1	1	1	8	0	9	0	0	0	8	17	9
08:15 08:3	0 0	0	0	0	0	0	0	1	1	1	5	0	6	0	0	0	5	11	6
08:30 08:4	5 0	0	0	0	0	0	0	5	5	5	14	0	19	0	0	0	14	33	19
08:45 09:0	0 0	0	0	0	0	0	0	3	3	3	16	0	19	0	0	0	16	35	19
09:00 09:1	5 0	0	0	0	0	0	0	4	4	4	11	0	15	0	0	0	11	26	15
09:15 09:3	0 0	0	0	0	0	0	0	3	3	3	12	0	15	0	0	0	12	27	15
09:30 09:4	5 0	0	0	0	0	0	0	0	0	0	13	0	13	0	0	0	13	26	13
09:45 10:0	0 0	0	0	0	0	0	0	2	2	2	8	0	10	0	0	0	8	18	10
11:30 11:4	5 0	0	0	0	0	0	0	1	1	1	8	0	9	0	0	0	8	17	9
11:45 12:0	0 0	0	0	0	0	0	0	2	2	2	3	0	5	0	0	0	3	8	5
12:00 12:1	5 0	0	0	0	0	0	0	0	0	0	5	0	5	0	0	0	5	10	5
12:15 12:3	0 0	0	0	0	0	0	0	4	4	4	11	0	15	0	0	0	11	26	15
12:30 12:4	5 0	0	0	0	0	0	0	3	3	3	6	0	9	0	0	0	6	15	9
12:45 13:0	0 0	0	0	0	0	0	0	1	1	1	8	0	9	0	0	0	8	17	9
13:00 13:1	5 0	0	0	0	0	0	0	0	0	0	12	0	12	0	0	0	12	24	12
13:15 13:3	0 0	0	0	0	0	0	0	1	1	1	9	0	10	0	0	0	9	19	10
15:00 15:1	5 0	0	0	0	0	0	0	2	2	2	6	0	8	0	0	0	6	14	8
15:15 15:3	0 0	0	0	0	0	0	0	0	0	0	6	0	6	0	0	0	6	12	6
15:30 15:4	5 0	0	0	0	0	0	0	1	1	1	6	0	7	0	0	0	6	13	7
15:45 16:0	0 0	0	0	0	0	0	0	2	2	2	4	0	6	0	0	0	4	10	6
16:00 16:1	5 0	0	0	0	0	0	0	1	1	1	13	0	14	0	0	0	13	27	14
16:15 16:3	0 0	0	0	0	0	0	0	2	2	2	8	0	10	0	0	0	8	18	10
16:30 16:4	5 0	0	0	0	0	0	0	1	1	1	2	0	3	0	0	0	2	5	3
16:45 17:0	0 0	0	0	0	0	0	0	1	1	1	5	0	6	0	0	0	5	11	6
17:00 17:1	5 0	0	0	0	0	0	0	1	1	1	12	0	13	0	0	0	12	25	13
17:15 17:3	0 0	0	0	0	0	0	0	1	1	1	6	0	7	0	0	0	6	13	7
17:30 17:4	5 0	0	0	0	0	0	0	0	0	0	7	0	7	0	0	0	7	14	7
17:45 18:0	0 0	0	0	0	0	0	0	1	1	1	9	0	10	0	0	0	9	19	10
Total: Non	e 0	0	0	0	0	0	0	45	45	45	257	0	302	0	0	0	257	559	302

6	
	ttawa

		CHAMBE	ERLAIN AV	E @ KENT	ST	
ey Date: Wedne	esday, April	18, 2018		wo	) No:	40742
t Time: 07:00				De	vice:	Miovision
		E.III S	tudy 15 Mir			
		KENT S	1	CHAM	BERLAIN AVE	
Time	Period	Northbound U-Turn Total	Southbound U-Turn Total	Eastbound U-Turn Total	Westbound U-Turn Total	Total
07:00	07:15	0	0	0	0	0
07:15	07:30	0	0	0	0	0
07:30	07:45	0	0	0	0	0
07:45	08:00	0	0	0	0	0
08:00	08:15	0	0	0	0	0
08:15	08:30	0	0	0	0	0
08:30	08:45	0	0	0	0	0
08:45	09:00	0	0	0	0	0
09:00	09:15	0	0	0	0	0
09:15	09:30	0	0	0	0	0
09:30	09:45	0	0	0	0	0
09:45	10:00	0	0	0	0	0
11:30	11:45	0	0	0	0	0
11:45	12:00	0	0	0	0	0
12:00	12:15	0	0	0	0	0
12:15	12:30	0	0	0	0	0
12:30	12:45	0	0	0	0	0
12:45	13:00	0	0	0	0	0
13:00	13:15	0	0	0	0	0
13:15	13:30	0	0	0	0	0
15:00	15:15	0	0	0	0	0
15:15	15:30	0	0	0	0	0
15:30	15:45	0	0	0	0	0
15:45	16:00	0	0	0	0	0
16:00	16:15	0	0	0	0	0
16:15	16:30	0	0	0	0	0
16:30	16:45	0	0	0	0	0
16:45	17:00	0	0	0	0	0
17:00	17:15	0	0	0	0	0
17:15	17:30	0	0	0	0	0
17:30	17:45	0	0	0	0	0
17:45	18:00	0	0	0	0	0

## Appendix C

Synchro Intersection Worksheets – Existing Conditions



1: HWY 417 OR/Lyor ane Group ane Configurations Irraffic Volume (vph) "uture Volume (vph)	EBL	-										
ane Configurations Fraffic Volume (vph)	EBL		•	-	+	*	1	1	1	1	Ļ	~
Traffic Volume (vph)		EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)					441>						•	1
	0	0	0	222	219	0	0	0	0	0	258	123
	0	0	0	222	219	0	0	0	0	0	258	123
Satd. Flow (prot)	0	0	0	0	4645	0	0	0	0	0	1745	1483
Flt Permitted					0.975							
Satd. Flow (perm)	0	0	0	0	4612	0	0	0	0	0	1745	1454
Satd. Flow (RTOR)					247							137
ane Group Flow (vph)	0	0	0	0	490	0	0	0	0	0	287	137
Furn Type				Perm	NA						NA	Perm
Protected Phases					6						4	
Permitted Phases				6								4
Detector Phase				6	6						4	4
Switch Phase				-	-							
Minimum Initial (s)				10.0	10.0						10.0	10.0
Vinimum Split (s)				26.2	26.2						28.3	28.3
Fotal Split (s)				40.0	40.0						35.0	35.0
Total Split (%)				53.3%	53.3%						46.7%	46.7%
fellow Time (s)				3.3	3.3						3.3	3.3
All-Red Time (s)				1.9	1.9						2.0	2.0
Lost Time Adjust (s)					0.0						0.0	0.0
Fotal Lost Time (s)					5.2						5.3	5.3
_ead/Lag					•							
_ead-Lag Optimize?												
Recall Mode				C-Max	C-Max						Max	Max
Act Effct Green (s)				o max	34.8						29.7	29.7
Actuated g/C Ratio					0.46						0.40	0.40
//c Ratio					0.22						0.42	0.21
Control Delay					10.0						18.7	3.9
Queue Delay					0.0						0.0	0.0
Fotal Delay					10.0						18.7	3.9
_OS					B						B	A
Approach Delay					10.0						13.9	
Approach LOS					B						B	
Queue Length 50th (m)					19.1						28.5	0.0
Queue Length 95th (m)					m25.8						47.7	9.5
nternal Link Dist (m)		117.8			157.8			120.4			277.6	0.0
Furn Bay Length (m)		111.0			107.0			120.4			211.0	
Base Capacity (vph)					2272						691	658
Starvation Cap Reductn					0						0	000
Spillback Cap Reductn					0						0	0
Storage Cap Reductn					0						0	0
Reduced v/c Ratio					0.22						0.42	0.21
ntersection Summary												
Cycle Length: 75 Actuated Cycle Length: 75												
Offset: 48 (64%), Referenced to	o nhaso	2: and 6-1	NRTI 9	tart of C	oon							
	o pilase	2. anu 0.	WDIL, 3	itali Ul Gl	Cell							
Natural Cycle: 55 Control Type: Actuated-Coordii	natod											
control Type. Actuated-Coordi	nateu											

30-48 Chamberlain AM Peak Hour

Synchro 10 Light Report Page 1

Lanes, Volumes, Timings 1: HWY 417 OR/Lyon & Catherine		Existing 05-16-2024
Maximum v/c Ratio: 0.42		
Intersection Signal Delay: 11.8	Intersection LOS: B	

Intersection Signal Delay: 11.8	Intersection LOS: B
Intersection Capacity Utilization 47.6%	ICU Level of Service A
Analysis Period (min) 15	

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

Splits and Phases: 1: HWY 417 OR/Lyon & Catherine

	<ul> <li>         Ø4      </li> </ul>
	35 s
₩ Ø6 (R)	
40 s	

Synchro 10 Light Report Page 2

30-48 Chamberlain AM Peak Hour

	≯	-	$\mathbf{r}$	4	-	•	-	1	1	1	÷.	~
ane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBF
ane Configurations					<b>41</b> ×	1		4412				
raffic Volume (vph)	0	0	0	0	389	537	54	1333	0	0	0	
uture Volume (vph)	0	0	0	0	389	537	54	1333	0	0	0	
Satd. Flow (prot)	0	0	0	0	2916	1350	0	4755	0	0	0	
It Permitted								0.998				
Satd. Flow (perm)	0	0	0	0	2916	1262	0	4749	0	0	0	
Satd. Flow (RTOR)								70				
ane Group Flow (vph)	0	0	0	0	707	322	0	1541	0	0	0	
urn Type					NA	Perm	Perm	NA				
Protected Phases					6			8				
Permitted Phases						6	8					
Detector Phase					6	6	8	8				
Switch Phase												
/linimum Initial (s)					10.0	10.0	10.0	10.0				
/inimum Split (s)					27.8	27.8	17.8	17.8				
Total Split (s)					32.0	32.0	38.0	38.0				
otal Split (%)					42.7%	42.7%	50.7%	50.7%				
(ellow Time (s)					3.3	3.3	3.3	3.3				
II-Red Time (s)					2.5	2.5	2.5	2.5				
ost Time Adjust (s)					0.0	0.0		0.0				
Total Lost Time (s)					5.8	5.8		5.8				
.ead/Lag					Lag	Lag						
ead-Lag Optimize?					J	Ū						
Recall Mode					C-Max	C-Max	Max	Max				
Act Effct Green (s)					26.2	26.2		32.2				
Actuated g/C Ratio					0.35	0.35		0.43				
/c Ratio					0.69	0.73		0.74				
Control Delay					26.9	31.7		19.7				
Queue Delay					0.0	0.0		0.0				
Total Delay					26.9	31.7		19.7				
.0S					С	С		В				
Approach Delay					28.4			19.7				
pproach LOS					С			В				
Queue Length 50th (m)					49.8	45.9		61.5				
Queue Length 95th (m)					m61.0	m57.3		77.9				
nternal Link Dist (m)		157.8			130.6			47.0			56.6	
urn Bay Length (m)												
Base Capacity (vph)					1018	440		2078				
Starvation Cap Reductn					0	0		0				
Spillback Cap Reductn					0	0		0				
Storage Cap Reductn					0	0		0				
Reduced v/c Ratio					0.69	0.73		0.74				
ntersection Summary												
Cycle Length: 75												_
Actuated Cycle Length: 75												
Offset: 15 (20%), Referenced	to phase	2: and 6:	NRT Sta	rt of Cro	on							

30-48 Chamberlain AM Peak Hour

Synchro 10 Light Report Page 3

Lanes, Volumes, Timings	Existing
2: Kent & Catherine	05-16-2024

Lane Group	Ø5
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	5
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	5.0
Total Split (s)	5.0
Total Split (%)	7%
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	
Recall Mode	Max
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (m)	
Queue Length 95th (m)	
Internal Link Dist (m)	
Turn Bay Length (m)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Storage Cap Reductn Reduced v/c Ratio	

30-48 Chamberlain AM Peak Hour

Synchro 10 Light Report Page 4

Lanes, Volumes, Timings	Existing
2: Kent & Catherine	05-16-2024
Maximum v/c Ratio: 0.74	

Intersection Signal Delay: 23.2	Intersection LOS: C	
Intersection Capacity Utilization 64.8%	ICU Level of Service C	
Analysis Period (min) 15		
m Volume for 95th percentile queue is metered by u	ipstream signal.	
Splits and Phases: 2: Kent & Catherine		

	⊁	-	-		1	1		
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø4	
Lane Configurations		<b>^</b>						
Traffic Volume (vph)	0	682	0	0	0	0		
Future Volume (vph)	0	682	0	0	0	0		
Satd. Flow (prot)	0	3316	0	0	0	0		
Flt Permitted	-		-	-	-	-		
Satd. Flow (perm)	0	3316	0	0	0	0		
Satd. Flow (RTOR)								
Lane Group Flow (vph)	0	758	0	0	0	0		
Turn Type		NA						
Protected Phases		2					4	
Permitted Phases								
Detector Phase		2						
Switch Phase								
Vinimum Initial (s)	_	10.0					10.0	
Vinimum Split (s)		36.0					21.0	
Total Split (s)		36.0					21.0	
Total Split (%)		63.2%					37%	
Yellow Time (s)		3.3					3.0	
All-Red Time (s)		1.7					1.0	
Lost Time Adjust (s)		0.0						
Total Lost Time (s)		5.0						
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode		Min					None	
Act Effct Green (s)		32.8						
Actuated q/C Ratio		0.63						
v/c Ratio		0.36						
Control Delay		7.5						
Queue Delay		0.0						
Total Delay		7.5						
LOS		A						
Approach Delay		7.5						
Approach LOS		A						
Queue Length 50th (m)		21.9						
Queue Length 95th (m)		31.6						
Internal Link Dist (m)		270.2	176.4		31.3			
Turn Bay Length (m)								
Base Capacity (vph)	_	2163						
Starvation Cap Reductn		0						
Spillback Cap Reductn	_	Ű						
Storage Cap Reductn		0						
Reduced v/c Ratio	_	0.35						
Intersection Summary								
	_							
Cycle Length: 57								
Actuated Cycle Length: 51.7 Natural Cycle: 60								
Natural Cycle: 60 Control Type: Semi Act-Uncoord	4							
Maximum v/c Ratio: 0.36								
viaxinium v/c Ratio: 0.36								

Lanes, Volumes, Timings 3: Chamberlain & Kent		Existing 05-16-2024
Intersection Signal Delay: 7.5	Intersection LOS: A	
Intersection Capacity Utilization 24.1%	ICU Level of Service A	
Analysis Period (min) 15		
Splits and Phases: 3: Chamberlain & Kent		
<b>→</b> ø2	<b>∦</b> \$ø4	
36 s	21 s	

	≯	-	~	~	-		•	<b>†</b>	-	1	1	1
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBI
Lane Configurations	202	201	2011		4 <b>†</b> Ъ				HBR	002	<b>†</b> ‡	0.0
Traffic Volume (vph)	0	0	0	160	582	189	272	626	0	0	363	11
Future Volume (vph)	0	0	0	160	582	189	272	626	0	0	363	11
Satd. Flow (prot)	0	0	0	0	4481	0	0	3266	0	0	2996	
Fit Permitted	-	-	-	-	0.991	-	-	0.633	-	-		
Satd. Flow (perm)	0	0	0	0	4429	0	0	2035	0	0	2996	
Satd. Flow (RTOR)					80						51	
ane Group Flow (vph)	0	0	0	0	1035	0	0	998	0	0	525	
Turn Type				Perm	NA		pm+pt	NA			NA	
Protected Phases					8		5	2			6	
Permitted Phases				8			2					
Detector Phase				8	8		5	2			6	
Switch Phase												
Vinimum Initial (s)				10.0	10.0		5.0	10.0			10.0	
Vinimum Split (s)				23.6	23.6		10.4	21.4			21.4	
Fotal Split (s)				25.0	25.0		15.0	40.0			25.0	
Total Split (%)				33.3%	33.3%		20.0%	53.3%			33.3%	
Yellow Time (s)				3.3	3.3		3.3	3.3			3.3	
All-Red Time (s)				2.3	2.3		2.1	2.1			2.1	
Lost Time Adjust (s)					0.0			0.0			0.0	
Total Lost Time (s)					5.6			5.4			5.4	
_ead/Lag				Lag	Lag			-			Lag	
Lead-Lag Optimize?				Yes	Yes						Yes	
Recall Mode				Max	Max		Max	C-Max			C-Max	
Act Effct Green (s)					19.4			34.6			19.6	
Actuated g/C Ratio					0.26			0.46			0.26	
//c Ratio					0.86			0.91			0.64	
Control Delay					33.3			18.0			26.3	
Queue Delay					0.0			0.0			0.2	
Total Delay					33.3			18.0			26.4	
LOS					С			В			С	
Approach Delay					33.3			18.0			26.4	
Approach LOS					С			В			С	
Queue Length 50th (m)					47.3			15.1			31.1	
Queue Length 95th (m)					#69.1			m#34.1			46.7	
nternal Link Dist (m)		130.6			383.3			80.8			138.4	
Turn Bay Length (m)												
Base Capacity (vph)					1204			1096			820	
Starvation Cap Reductn					0			0			0	
Spillback Cap Reductn					0			0			29	
Storage Cap Reductn					0			0			0	
Reduced v/c Ratio					0.86			0.91			0.66	
ntersection Summary												
Cycle Length: 75												
Actuated Cycle Length: 75												
Offset: 70 (93%), Referenced	d to phase	2:NBTL a	and 6:SB	T, Start o	of Green							
Natural Cycle: 80												
Control Type: Actuated-Coor	dinated											

Synchro 10 Light Report Page 7

Lanes, Volumes, Timings	Existing
4: Bank & Catherine	05-16-2024

Lane Group	Ø7	Ø9	Ø13
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			_
Satd. Flow (RTOR)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	7	9	13
Permitted Phases		0	10
Detector Phase			
Switch Phase			
Minimum Initial (s)	1.0	1.0	1.0
Minimum Split (s)	5.0	5.0	5.0
Total Split (s)	5.0	5.0	5.0
Total Split (%)	7%	7%	7%
Yellow Time (s)	2.0	2.0	2.0
All-Red Time (s)	2.0	0.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0
Total Lost Time (s)			
	المعط		ا مع ا
Lead/Lag Lead-Lag Optimize?	Lead Yes		Lead Yes
Recall Mode		Max	
	Max	Max	Max
Act Effct Green (s)		_	
Actuated g/C Ratio			
v/c Ratio		_	
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (m)			
Queue Length 95th (m)			
Internal Link Dist (m)			
Turn Bay Length (m)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			
Intersection Summary			_
intersection ournindly			

Lanes, Volumes, Timings 4: Bank & Catherine		Existing 05-16-2024
Maximum v/c Ratio: 0.91		
Intersection Signal Delay: 25.9	Intersection LOS: C	
Intersection Capacity Utilization 79.0%	ICU Level of Service D	

 Intersection Capacity Utilization /9.0%
 ICU L

 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: 4: Bank & Catherine

● ● ● ● Ø2 (R)				
5s 40s				
●ø18 ↓ ø6 (R)	<b>▲</b> ø₅	Ø	7 <b>7</b> Ø8	
5 s 25 s	15 s	5s	25 s	

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	۶	-	$\rightarrow$	1	+		1	1	1	1	↓ I	-
ane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SB
ane Configurations		†î≽	1					<b>≜</b> †⊅		5	1	
raffic Volume (vph)	74	487	75	0	0	0	0	834	142	168	372	
uture Volume (vph)	74	487	75	0	0	0	0	834	142	168	372	
atd. Flow (prot)	0	3292	1483	0	0	0	0	3154	0	1658	1745	
It Permitted		0.993								0.145		
atd. Flow (perm)	0	3285	1394	0	0	0	0	3154	0	253	1745	
atd. Flow (RTOR)			134					27				
ane Group Flow (vph)	0	623	83	0	0	0	0	1085	0	187	413	
urn Type	Perm	NA	Perm					NA		pm+pt	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4							6		
etector Phase	4	4	4					2		1	6	
witch Phase												
linimum Initial (s)	10.0	10.0	10.0					10.0		5.0	10.0	
linimum Split (s)	26.2	26.2	26.2					23.1		11.1	23.1	
otal Split (s)	29.0	29.0	29.0					31.0		15.0	46.0	
otal Split (%)	38.7%	38.7%	38.7%					41.3%		20.0%	61.3%	
ellow Time (s)	3.3	3.3	3.3					3.0		3.0	3.0	
II-Red Time (s)	2.9	2.9	2.9					3.1		3.1	3.1	
ost Time Adjust (s)		0.0	0.0					0.0		0.0	0.0	
otal Lost Time (s)		6.2	6.2					6.1		6.1	6.1	
ead/Lag								Lead		Lag		
ead-Lag Optimize?								Yes		Yes		
Recall Mode	None	None	None					C-Max		None	C-Max	
ct Effct Green (s)		19.3	19.3					28.4		43.4	43.4	
ctuated g/C Ratio		0.26	0.26					0.38		0.58	0.58	
/c Ratio		0.74	0.18					0.90		0.60	0.41	
Control Delay		30.9	2.2					34.6		27.1	8.2	
ueue Delay		0.0	0.0					0.0		0.0	1.3	
otal Delay		30.9	2.2					34.6		27.1	9.5	
OS		С	А					С		С	A	
pproach Delay		27.5						34.6			15.0	
pproach LOS		C						С			В	
Queue Length 50th (m)		41.8	0.0					73.7		14.1	21.3	
Queue Length 95th (m)		55.7	3.4					#122.9		m31.4	m28.4	
nternal Link Dist (m)		176.4			219.4			129.7			80.8	
urn Bay Length (m)			30.0									
ase Capacity (vph)		998	517					1211		313	1009	
tarvation Cap Reductn		0	0					0		0	389	
pillback Cap Reductn		0	0					0		0	0	
torage Cap Reductn		0	0					0		0	0	
Reduced v/c Ratio		0.62	0.16					0.90		0.60	0.67	
ntersection Summary												
Cycle Length: 75												
ctuated Cycle Length: 75												
Offset: 1 (1%), Referenced	to phase 2	NRT and	6.SBTI	Start of G	roon							

Synchro 10 Light Report Page 1

Lanes, Volumes, Timings 5: Bank & Chamberlain/Isabella		2020 Existing 04/13/2023
Maximum v/c Ratio: 0.90		
Intersection Signal Delay: 27.6	Intersection LOS: C	
Intersection Capacity Utilization 75.1%	ICU Level of Service D	
Analysis Period (min) 15		
# 95th percentile volume exceeds capacity, queue	e may be longer.	
Queue shown is maximum after two cycles.		
m Volume for 95th percentile queue is metered by	/ upstream signal.	

Splits and Phases: 5: Bank & Chamberlain/Isabella

30-48 Chamberlain AM Peak Hour

Ø2 (R)	Ø1	<b>4</b> 04	
31 s	15 s	29 s	
Ø6 (R)			
46 s			

Lanes, Volumes, Tir 1: HWY 417 OR/Lyc												isting -16-2024	
	۶	-	$\mathbf{i}$	4	+	*	1	1	1	1	Ŧ	4	
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations					441>						1	1	
Traffic Volume (vph)	0	0	0	192	436	0	0	0	0	0	343	255	
Future Volume (vph)	0	0	0	192	436	0	0	0	0	0	343	255	
Satd. Flow (prot)	0	0	0	0	4693	0	0	0	0	0	1745	1483	
Flt Permitted					0.985								
Satd. Flow (perm)	0	0	0	0	4657	0	0	0	0	0	1745	1443	
Satd. Flow (RTOR)					153							104	
Lane Group Flow (vph)	0	0	0	0	697	0	0	0	0	0	381	283	
Turn Type				Perm	NA						NA	Perm	
Protected Phases					6						4		
Permitted Phases				6	, v							4	
Detector Phase				6	6						4	4	
Switch Phase				Ū	Ŭ						-		
Minimum Initial (s)				10.0	10.0						10.0	10.0	
Minimum Split (s)				26.2	26.2						28.3	28.3	
Total Split (s)				28.0	28.0						47.0	47.0	
Total Split (%)				37.3%	37.3%						62.7%	62.7%	
				37.3 %	37.3 %						3.3	3.3	
Yellow Time (s)				3.3 1.9	3.3 1.9						3.3 2.0	3.3 2.0	
All-Red Time (s)				1.9									
Lost Time Adjust (s)					0.0 5.2						0.0 5.3	0.0	
Total Lost Time (s)					5.Z						5.3	5.3	
Lead/Lag													
Lead-Lag Optimize?				0.14-11	0.14-11						Maria	Maria	
Recall Mode				C-Max	C-Max						Max	Max	
Act Effct Green (s)					22.8						41.7	41.7	
Actuated g/C Ratio					0.30						0.56	0.56	
v/c Ratio					0.46						0.39	0.33	
Control Delay					15.4						11.0	6.8	
Queue Delay					0.0						0.0	0.0	
Total Delay					15.4						11.0	6.8	
LOS					В						В	A	
Approach Delay					15.4						9.2		
Approach LOS					В						A		
Queue Length 50th (m)					9.1						28.1	11.8	
Queue Length 95th (m)					11.3						45.5	24.7	
Internal Link Dist (m)		117.8			157.8			120.4			277.6		
Turn Bay Length (m)													
Base Capacity (vph)					1522						970	848	
Starvation Cap Reductn					0						0	0	
Spillback Cap Reductn					0						0	0	
Storage Cap Reductn					0						0	0	
Reduced v/c Ratio					0.46						0.39	0.33	
Intersection Summary													
Cycle Length: 75													
Actuated Cycle Length: 75													
Offset: 24 (32%), Referenced	I to phase	2: and 6:	WBTL, S	start of Gr	een								
Natural Cycle: 55													
Control Type: Actuated-Coor	dinated												

Synchro 10 Light Report Page 1

Lanes, Volumes, Timings 1: HWY 417 OR/Lyon & Catherine		Existing 05-16-2024
Maximum v/c Ratio: 0.46		
Intersection Signal Delay: 12.4	Intersection LOS: B	
Intersection Capacity Utilization 45.8%	ICU Level of Service A	
Analysis Period (min) 15		

Splits and Phases: 1: HWY 417 OR/Lyon & Catherine

30-48 Chamberlain PM PEAK HOUR



Synchro

2: Kent & Catherine	≯		~	~	+	•	•	Ť	~	1	1	2
	EBL		•	♥ WBL	WBT	•	NBL		•		* 0DT	-
ane Group	EBL	EBT	EBR	WBL		WBR	NBL	NBT	NBR	SBL	SBT	SB
ane Configurations	0	0	0	0	<b>↑1</b> → 593	289	25	<b>4↑↑</b> 720	0	0	0	
Traffic Volume (vph)	0	0		-	593			720	0	-	0	
Future Volume (vph)			0	0		289	25		-	0		
Satd. Flow (prot)	0	0	0	0	3143	1350	0	4755	0	0	0	
Fit Permitted	0	0	0	0	0440	1017	0	0.998	0	0	0	
Satd. Flow (perm)	0	0	0	0	3143	1247	0	4752	0	0	0	
Satd. Flow (RTOR)			_					70				
ane Group Flow (vph)	0	0	0	0	691	289	0	828	0	0	0	
Furn Type					NA	Perm	Perm	NA				
Protected Phases					6			8				
Permitted Phases						6	8					
Detector Phase					6	6	8	8				
Switch Phase												
Minimum Initial (s)					10.0	10.0	10.0	10.0				
Vinimum Split (s)					27.8	27.8	17.8	17.8				
Total Split (s)					38.0	38.0	32.0	32.0				
Total Split (%)					50.7%	50.7%	42.7%	42.7%				
Yellow Time (s)					3.3	3.3	3.3	3.3				
All-Red Time (s)					2.5	2.5	2.5	2.5				
_ost Time Adjust (s)					0.0	0.0		0.0				
Total Lost Time (s)					5.8	5.8		5.8				
_ead/Lag					Lag	Lag						
_ead-Lag Optimize?					Lug	Lug						
Recall Mode					C-Max	C-Max	Max	Max				
Act Effct Green (s)					32.2	32.2	max	26.2				
Actuated g/C Ratio					0.43	0.43		0.35				
//c Ratio					0.51	0.54		0.49				
Control Delay					14.1	16.6		18.5				
					0.0	0.0		0.0				
Queue Delay					14.1			18.5				
Total Delay						16.6						
LOS					B	В		B				
Approach Delay					14.8			18.5				
Approach LOS					В			В				
Queue Length 50th (m)					30.2	25.3		30.0				
Queue Length 95th (m)					m42.9	m38.9		40.6				
nternal Link Dist (m)		157.8			130.6			43.8			56.6	
Turn Bay Length (m)												
Base Capacity (vph)					1349	535		1705				
Starvation Cap Reductn					0	0		0				
Spillback Cap Reductn					0	0		0				
Storage Cap Reductn					0	0		0				
Reduced v/c Ratio					0.51	0.54		0.49				
ntersection Summary												
Cycle Length: 75												
Actuated Cycle Length: 75												
Offset: 12 (16%), Referenced	to phase	2: and 6:	WBT, Sta	rt of Gre	en							
Natural Cycle: 55												

Synchro 10 Light Report Page 3

Lanes, Volumes, Timings	Existing
2: Kent & Catherine	05-16-2024

Lane Group	Ø5
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	5
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	5.0
Total Split (s)	5.0
Total Split (%)	7%
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	
Recall Mode	Max
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (m)	
Queue Length 95th (m)	
Internal Link Dist (m)	
Turn Bay Length (m)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

30-48 Chamberlain PM PEAK HOUR

Lanes, Volumes, Timings 2: Kent & Catherine		Existing 05-16-2024
Maximum v/c Ratio: 0.54		
Intersection Signal Delay: 16.5	Intersection LOS: R	

intereesterine eignan b	0.4.1.1.0.0	
Intersection Capacity	/ Utilization 48.2%	ICU Level of Service A
Analysis Period (min	) 15	
m Volume for 95th	percentile queue is metered by upstream s	signal.
Splits and Phases:	2: Kent & Catherine	

● Ø5 ● Ø6 (R)	<\ ↑ø8
5 s 38 s	32 s

	≯	-	-	*	1	∢_		
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø4	
Lane Configurations		<b>^</b>						
Traffic Volume (vph)	0	772	0	0	0	0		
Future Volume (vph)	0	772	0	0	0	0		
Satd. Flow (prot)	0	3316	0	0	0	0		
Flt Permitted								
Satd. Flow (perm)	0	3316	0	0	0	0		
Satd. Flow (RTOR)								
Lane Group Flow (vph)	0	858	0	0	0	0		
Turn Type		NA						
Protected Phases		2					4	
Permitted Phases								
Detector Phase		2						
Switch Phase								
Minimum Initial (s)		10.0					10.0	
Minimum Split (s)		36.0					21.0	
Total Split (s)		36.0					21.0	
Total Split (%)		63.2%					37%	
Yellow Time (s)		3.3					3.0	
All-Red Time (s)		1.7					1.0	
Lost Time Adjust (s)		0.0						
Total Lost Time (s)		5.0						
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode		Min					None	
Act Effct Green (s)		35.8						
Actuated g/C Ratio		0.83						
v/c Ratio		0.31						
Control Delay		4.3						
Queue Delay		0.0						
Total Delay		4.3						
LOS		A						
Approach Delay		4.3						
Approach LOS		A						
Queue Length 50th (m)		0.0						
Queue Length 95th (m)		36.3						
Internal Link Dist (m)		270.2	176.4		23.7			
Turn Bay Length (m)								
Base Capacity (vph)		2764						
Starvation Cap Reductn		0						
Spillback Cap Reductn		0						
Storage Cap Reductn		0						
Reduced v/c Ratio		0.31						
Intersection Summary								
Cycle Length: 57								
Actuated Cycle Length: 43								
Natural Cycle: 60								
Control Type: Semi Act-Uncoor	d							
Maximum v/c Ratio: 0.31								

Lanes, Volumes, Timings 3: Chamberlain & Kent		Existing 05-16-2024
Intersection Signal Delay: 4.3	Intersection LOS: A	
Intersection Capacity Utilization 26.7%	ICU Level of Service A	
Analysis Period (min) 15		
Splits and Phases: 3: Chamberlain & Kent		
<b>→</b> ø2	<b>Å</b> Åø₄	
36 s	21 s	

	≯	-	$\mathbf{r}$	1	-		-	<b>†</b>	~	1	Ļ	4
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBI
ane Configurations					ፈቶኩ			41			<b>≜</b> †}	
Traffic Volume (vph)	0	0	0	225	484	137	182	320	0	0	643	11
Future Volume (vph)	0	0	0	225	484	137	182	320	0	0	643	11
Satd. Flow (prot)	0	0	0	0	4536	0	0	3256	0	0	3095	
FIt Permitted					0.987			0.547				
Satd. Flow (perm)	0	0	0	0	4474	0	0	1814	0	0	3095	
Satd. Flow (RTOR)					50						26	
Lane Group Flow (vph)	0	0	0	0	940	0	0	558	0	0	836	
Turn Type				Perm	NA		pm+pt	NA			NA	
Protected Phases				_	8		5	2			6	
Permitted Phases				8			2					
Detector Phase				8	8		5	2			6	
Switch Phase												
Vinimum Initial (s)				10.0	10.0		5.0	10.0			10.0	
Vinimum Split (s)				23.6	23.6		10.4	21.4			21.4	
Total Split (s)				24.0	24.0		14.0	41.0			27.0	
Total Split (%)				32.0%	32.0%		18.7%	54.7%			36.0%	
Yellow Time (s)				3.3	3.3		3.3	3.3			3.3	
All-Red Time (s)				2.3	2.3 0.0		2.1	2.1 0.0			2.1 0.0	
Lost Time Adjust (s)					5.6			5.4			5.4	
Total Lost Time (s) Lead/Lag				Lag	5.0 Lag			5.4			5.4 Lag	
Lead-Lag Optimize?				Lag	Lag						Yes	
Recall Mode				Max	Max		Max	C-Max			C-Max	
Act Effct Green (s)				IVIAA	18.4		IVIAA	35.6			21.6	
Actuated g/C Ratio					0.25			0.47			0.29	
//c Ratio					0.83			0.54			0.92	
Control Delay					33.0			12.0			42.4	
Queue Delay					0.0			0.0			46.0	
Total Delay					33.0			12.0			88.3	
LOS					C			В			F	
Approach Delay					33.0			12.0			88.3	
Approach LOS					С			В			F	
Queue Length 50th (m)					43.8			15.1			58.2	
Queue Length 95th (m)					#60.2			19.1			#92.8	
nternal Link Dist (m)		130.6			383.3			80.8			138.4	
Furn Bay Length (m)												
Base Capacity (vph)					1135			1026			909	
Starvation Cap Reductn					0			0			0	
Spillback Cap Reductn					2			0			151	
Storage Cap Reductn					0			0			0	
Reduced v/c Ratio					0.83			0.54			1.10	
ntersection Summary												
Cycle Length: 75												
Actuated Cycle Length: 75												
Offset: 50 (67%), Reference	d to phase	2:NBTL a	and 6:SE	ST, Start o	of Green							
Natural Cycle: 70												
Control Type: Actuated-Cool	rdinated											

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Lanes, Volumes, Timings	Existing
4: Bank & Catherine	05-16-2024

Lane Group	Ø7	Ø9	Ø13
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Satd. Flow (RTOR)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	7	9	13
Protected Phases Permitted Phases	1	9	13
		_	_
Detector Phase Switch Phase			
	4.0	4.0	4.0
Minimum Initial (s)	1.0	1.0	1.0
Minimum Split (s)	5.0	5.0	5.0
Total Split (s)	5.0	5.0	5.0
Total Split (%)	7%	7%	7%
Yellow Time (s)	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lead		Lead
Lead-Lag Optimize?			Yes
Recall Mode	Max	Max	Max
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			_
Approach LOS			
Queue Length 50th (m)			
Queue Length 95th (m)			
Internal Link Dist (m)			
Turn Bay Length (m)		_	
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			
Intersection Summary		_	_
and boundary			

Lanes, Volumes, Timings 4: Bank & Catherine		Existing 05-16-2024
Maximum v/c Ratio: 0.92		
Intersection Signal Delay: 47.8	Intersection LOS: D	
Intersection Capacity Utilization 72.7%	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.

Splits and Phases: 4: Bank & Catherine



30-48 Chamberlain PM PEAK HOUR

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30-48 Chamberlain PM PEAK HOUR

	≯	-	$\mathbf{i}$	4	+	*	•	1	1	1	Ļ	4
_ane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBI
ane Configurations		†î≽	1					A1⊅			-۠	
Traffic Volume (vph)	53	590	120	0	0	0	0	448	91	175	720	
Future Volume (vph)	53	590	120	0	0	0	0	448	91	175	720	
Satd, Flow (prot)	0	3302	1483	0	0	0	0	3097	0	0	3283	
Flt Permitted	-	0.996		-	-	-	-		-	-	0.701	
Satd. Flow (perm)	0	3299	1345	0	0	0	0	3097	0	0	2284	
Satd. Flow (RTOR)			134				-	33				
ane Group Flow (vph)	0	715	133	0	0	0	0	599	0	0	994	
Turn Type	Perm	NA	Perm				-	NA		pm+pt	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4	-	4					_		6	-	
Detector Phase	4	4	4					2		1	6	
Switch Phase								-			5	
Vinimum Initial (s)	10.0	10.0	10.0					10.0		5.0	10.0	
Vinimum Split (s)	26.2	26.2	26.2					23.1		11.1	23.1	
Total Split (s)	31.0	31.0	31.0					30.0		14.0	44.0	
Fotal Split (%)	41.3%	41.3%	41.3%					40.0%		18.7%	58.7%	
Yellow Time (s)	3.3	3.3	3.3					3.0		3.0	3.0	
All-Red Time (s)	2.9	2.9	2.9					3.1		3.1	3.1	
Lost Time Adjust (s)	2.5	0.0	0.0					0.0		5.1	0.0	
Fotal Lost Time (s)		6.2	6.2					6.1			6.1	
_ead/Lag		0.2	0.2					Lead		Lag	0.1	
_ead-Lag Optimize?								Yes		Yes		
Recall Mode	None	None	None					C-Max		None	C-Max	
Act Effct Green (s)	NULLE	21.5	21.5					41.2		NULLE	41.2	
Actuated g/C Ratio		0.29	0.29					0.55			0.55	
/c Ratio		0.29	0.23					0.35			0.79	
Control Delay		29.6	5.3					10.2			16.4	
Queue Delay		29.0	0.0					0.0			10.4	
Total Delay		29.6	5.3					10.2			26.8	
_OS		29.0 C	5.5 A					IU.Z			20.0 C	
		25.8	A					в 10.2			26.8	
Approach Delay												
Approach LOS		C	0.0					B			C 81.8	
Queue Length 50th (m)		47.6	10.5					21.8				
Queue Length 95th (m)		62.4	10.5		040.4			34.8			m92.5	
nternal Link Dist (m)		176.4	00.0		219.4			129.7			80.8	
Furn Bay Length (m)		4000	30.0					1714			1253	
Base Capacity (vph)		1090	534									
Starvation Cap Reductn		0	0					0			242	
Spillback Cap Reductn		0	0					0			0	
Storage Cap Reductn		0	0					0			0	
Reduced v/c Ratio		0.66	0.25					0.35			0.98	
ntersection Summary												
Cycle Length: 75												
Actuated Cycle Length: 75												
Offset: 60 (80%), Referenc	ed to phase	e 2:NBT a	ind 6:SBTI	L, Start of	Green							
latural Cycle: 65												

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Lanes, Volumes, Timings	Existing
5: Bank & Chamberlain/Isabella	05-16-2024
Maximum v/c Ratio: 0.79	

Intersection Signal Delay: 22.4	Intersection LOS: C	
Intersection Capacity Utilization 81.3%	ICU Level of Service D	
Analysis Period (min) 15		

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

Splits and Phases: 5: Bank & Chamberlain/Isabella

Ø2 (R)	Ø1	 ۥ04
30 s	14 s	31s
Ø6 (R)		
44 s		

30-48 Chamberlain PM PEAK HOUR



**Collision Data** 



Accident Date	Accident Year	Accident Time	Location	Environment Condition	Light	Traffic Control	Traffic Control Condition	Classification Of Accident	Initial Impact Type	Road Surface Condition	# Vehicles	# Motorcycles	# Bicycles	# Pedestrians
2016-10-13	2016	10:56	BANK ST @ CHAMBERLAIN AVE N/ISABELLA ST (0002132)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	04 - Sideswipe	01 - Dry	2	Ó	0	0
2016-10-10	2016	19:17	BANK ST @ CHAMBERLAIN AVE N/ISABELLA ST (0002132)	01 - Clear	07 - Dark	01 - Traffic signal	01 - Functioning	03 - P.D. only	04 - Sideswipe	01 - Dry	2	0	0	0
2016-10-30	2016	15:08	BANK ST @ CHAMBERLAIN AVE N/ISABELLA ST (0002132)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	02 - Non-fatal injury	02 - Angle	01 - Dry	2	0	0	0
2016-11-05	2016	13:49	BANK ST @ CHAMBERLAIN AVE N/ISABELLA ST (0002132)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	02 - Angle	01 - Dry	2	0	0	0
2016-12-31	2016	15:23	BANK ST @ CHAMBERLAIN AVE N/ISABELLA ST (0002132)	03 - Snow	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	03 - Rear end	03 - Loose snow	2	0	0	0
2016-03-21	2016	11:12	BANK ST @ CHAMBERLAIN AVE N/ISABELLA ST (0002132)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	05 - Turning movement	01 - Dry	2	0	0	0
2016-03-04	2016	14:55	BANK ST @ CHAMBERLAIN AVE N/ISABELLA ST (0002132)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	02 - Angle	01 - Dry	2	0	0	0
2016-01-11	2016	1:39	BANK ST @ CHAMBERLAIN AVE N/ISABELLA ST (0002132)	03 - Snow	07 - Dark	01 - Traffic signal	01 - Functioning	03 - P.D. only	02 - Angle	03 - Loose snow	2	0	0	0
2016-01-11	2016	21:08	BANK ST @ CHAMBERLAIN AVE N/ISABELLA ST (0002132)	01 - Clear	07 - Dark	01 - Traffic signal	01 - Functioning	02 - Non-fatal injury	07 - SMV other	02 - Wet	1	0	0	1
2016-01-03	2016	22:14	BANK ST @ CHAMBERLAIN AVE N/ISABELLA ST (0002132)	01 - Clear	07 - Dark	01 - Traffic signal	01 - Functioning	03 - P.D. only	02 - Angle	02 - Wet	2	0	0	0
2016-04-21	2016	15:40	BANK ST @ CHAMBERLAIN AVE N/ISABELLA ST (0002132)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	03 - Rear end	01 - Dry	2	0	0	0
2016-05-31	2016	8:32	BANK ST @ CHAMBERLAIN AVE N/ISABELLA ST (0002132)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	04 - Sideswipe	01 - Dry	2	0	1	0
2016-06-20	2016	2:12	BANK ST @ CHAMBERLAIN AVE N/ISABELLA ST (0002132)	01 - Clear	07 - Dark	01 - Traffic signal	01 - Functioning	03 - P.D. only	02 - Angle	01 - Dry	2	0	0	0
2016-06-25	2016	10:38	BANK ST @ CHAMBERLAIN AVE N/ISABELLA ST (0002132)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	02 - Angle	01 - Dry	2	0	0	0
2016-07-04	2016	0:24	BANK ST @ CHAMBERLAIN AVE N/ISABELLA ST (0002132)	01 - Clear	07 - Dark	01 - Traffic signal	01 - Functioning	03 - P.D. only	02 - Angle	01 - Dry	2	0	0	0
2016-08-26	2016	13:33	BANK ST @ CHAMBERLAIN AVE N/ISABELLA ST (0002132)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	03 - Rear end	01 - Dry	3	0	0	0
2016-09-20	2016	18:46	BANK ST @ CHAMBERLAIN AVE N/ISABELLA ST (0002132)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	04 - Sideswipe	01 - Dry	2	0	0	0
2017-12-15 2017-02-27	2017	16:39	BANK ST @ CHAMBERLAIN AVE N/ISABELLA ST (0002132)	03 - Snow	05 - Dusk	01 - Traffic signal	01 - Functioning	03 - P.D. only	04 - Sideswipe	02 - Wet	3	0	0	0
	2017	14:49	BANK ST @ CHAMBERLAIN AVE N/ISABELLA ST (0002132)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	02 - Angle	01 - Dry	2	0	0	0
2017-04-08 2017-04-29	2017 2017	15:02 13:25	BANK ST @ CHAMBERLAIN AVE N/ISABELLA ST (0002132)	01 - Clear 01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only 03 - P.D. only	05 - Turning movement 04 - Sideswipe	01 - Dry 01 - Dry	2	0	0	0
2017-04-29	2017	13:25	BANK ST @ CHAMBERLAIN AVE N/ISABELLA ST (0002132) BANK ST @ CHAMBERLAIN AVE N/ISABELLA ST (0002132)	01 - Clear 01 - Clear	01 - Daylight 01 - Daylight	01 - Traffic signal 01 - Traffic signal	01 - Functioning	03 - P.D. only 03 - P.D. only	02 - Angle	01 - Dry 01 - Dry	2	0	0	0
2017-07-16	2017	8:49	BANK ST @ CHAMBERLAIN AVE N/ISABELLA ST (0002132) BANK ST @ CHAMBERLAIN AVE N/ISABELLA ST (0002132)	01 - Clear 01 - Clear	01 - Daylight 01 - Daylight	01 - Traffic signal	01 - Functioning 01 - Functioning	02 - Non-fatal injury	02 - Angle 02 - Angle	01 - Dry 01 - Dry	2	0	0	0
2017-07-10	2017	17:16	BANK ST @ CHAMBERLAIN AVE N/ISABELLA ST (0002132) BANK ST @ CHAMBERLAIN AVE N/ISABELLA ST (0002132)	02 - Rain	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	03 - Rear end	02 - Wet	2	0	0	
2017-08-24	2017	20:58	BANK ST @ CHAMBERLAIN AVE N/ISABELLA ST (0002132)	01 - Clear	05 - Dusk	01 - Traffic signal	01 - Functioning	03 - P.D. only	04 - Sideswipe	01 - Dry	2	0	0	0
2017-09-13	2017	5:30	BANK ST @ CHAMBERLAIN AVE N/ISABELLA ST (0002132)	01 - Clear	07 - Dark	01 - Traffic signal	01 - Functioning	03 - P.D. only	02 - Angle	01 - Dry	2	0	0	0
2017-09-23	2017	14:50	BANK ST @ CHAMBERLAIN AVE N/ISABELLA ST (0002132)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	02 - Angle	01 - Dry	2	0	0	0
2018-10-18	2018	14:13	BANK ST @ CHAMBERLAIN AVE N/ISABELLA ST (0002132)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	03 - Rear end	01 - Dry	2	0	0	ő
2018-02-06	2018	20:50	BANK ST @ CHAMBERLAIN AVE N/ISABELLA ST (0002132)	01 - Clear	07 - Dark	01 - Traffic signal	01 - Functioning	03 - P.D. only	05 - Turning movement	02 - Wet	2	0	0	ő
2018-05-26	2018	11:40	BANK ST @ CHAMBERLAIN AVE N/ISABELLA ST (0002132)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	02 - Non-fatal injury	02 - Angle	01 - Dry	1	0	0	0
2018-05-14	2018	10:32	BANK ST @ CHAMBERLAIN AVE N/ISABELLA ST (0002132)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	02 - Non-fatal injury	02 - Angle	01 - Dry	2	0	ō	ō
2018-05-11	2018	15:08	BANK ST @ CHAMBERLAIN AVE N/ISABELLA ST (0002132)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	04 - Sideswipe	01 - Dry	2	0	0	0
2018-07-27	2018	14:15	BANK ST @ CHAMBERLAIN AVE N/ISABELLA ST (0002132)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	03 - Rear end	01 - Dry	2	0	0	0
2018-08-30	2018	13:20	BANK ST @ CHAMBERLAIN AVE N/ISABELLA ST (0002132)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	05 - Turning movement	01 - Dry	2	0	0	0
2018-01-16	2018	20:05	BANK ST @ CHAMBERLAIN AVE N/ISABELLA ST (0002132)	01 - Clear	07 - Dark	01 - Traffic signal	01 - Functioning	03 - P.D. only	05 - Turning movement	04 - Slush	1	0	0	0
2019-08-21	2019	16:00	BANK ST @ CHAMBERLAIN AVE N/ISABELLA ST (0002132)	01 - Clear	01 - Daylight	01 - Traffic signal	00 - Unknown	02 - Non-fatal injury	03 - Rear end	01 - Dry	2	0	0	0
2019-09-18	2019	0:37	BANK ST @ CHAMBERLAIN AVE N/ISABELLA ST (0002132)	01 - Clear	07 - Dark	01 - Traffic signal	01 - Functioning	03 - P.D. only	03 - Rear end	01 - Dry	2	0	0	0
2019-02-11	2019	8:44	BANK ST @ CHAMBERLAIN AVE N/ISABELLA ST (0002132)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	04 - Sideswipe	01 - Dry	3	0	0	0
2019-02-24	2019	17:05	BANK ST @ CHAMBERLAIN AVE N/ISABELLA ST (0002132)	02 - Rain	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	04 - Sideswipe	02 - Wet	2	0	0	0
2019-02-16	2019	22:13	BANK ST @ CHAMBERLAIN AVE N/ISABELLA ST (0002132)	01 - Clear	07 - Dark	01 - Traffic signal	00 - Unknown	03 - P.D. only	05 - Turning movement	02 - Wet	2	0	0	0
2019-04-13	2019	17:26	BANK ST @ CHAMBERLAIN AVE N/ISABELLA ST (0002132)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	05 - Turning movement	01 - Dry	2	0	0	0
2019-05-05	2019	13:20	BANK ST @ CHAMBERLAIN AVE N/ISABELLA ST (0002132)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	03 - Rear end	01 - Dry	2	0	0	0
2019-04-30	2019	22:56	BANK ST @ CHAMBERLAIN AVE N/ISABELLA ST (0002132)	01 - Clear	07 - Dark	01 - Traffic signal	01 - Functioning	03 - P.D. only	04 - Sideswipe	01 - Dry	2	0	0	0
2019-04-30	2019	18:09	BANK ST @ CHAMBERLAIN AVE N/ISABELLA ST (0002132)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	02 - Non-fatal injury	03 - Rear end	01 - Dry	2	0	0	0
2019-07-08	2019	21:37	BANK ST @ CHAMBERLAIN AVE N/ISABELLA ST (0002132)	01 - Clear	07 - Dark	01 - Traffic signal	01 - Functioning	03 - P.D. only	05 - Turning movement	01 - Dry	2	0	0	0
2019-07-25	2019	12:16	BANK ST @ CHAMBERLAIN AVE N/ISABELLA ST (0002132)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	04 - Sideswipe	01 - Dry	2	0	0	0
2019-08-13	2019	23:31	BANK ST @ CHAMBERLAIN AVE N/ISABELLA ST (0002132)	01 - Clear	07 - Dark	01 - Traffic signal	01 - Functioning	03 - P.D. only	04 - Sideswipe	01 - Dry	2	0	0	0
2019-08-11 2019-08-16	2019 2019	20:50 1:01	BANK ST @ CHAMBERLAIN AVE N/ISABELLA ST (0002132) BANK ST @ CHAMBERLAIN AVE N/ISABELLA ST (0002132)	01 - Clear 01 - Clear	07 - Dark 07 - Dark	01 - Traffic signal 01 - Traffic signal	01 - Functioning	03 - P.D. only 02 - Non-fatal injury	03 - Rear end 02 - Angle	01 - Dry 01 - Dry	2	0	0	0
2019-08-16	2019	10:55	BANK ST @ CHAMBERLAIN AVE N/ISABELLA ST (0002132) BANK ST @ CHAMBERLAIN AVE N/ISABELLA ST (0002132)	01 - Clear 01 - Clear	01 - Dark 01 - Daylight	01 - Traffic signal	01 - Functioning 01 - Functioning	02 - Non-ratal Injury 03 - P.D. only	02 - Angle 04 - Sideswipe	02 - Wet	2	0	0	0
2020-02-29	2020	15:57	BANK ST @ CHAMBERLAIN AVE N/ISABELLA ST (0002132) BANK ST @ CHAMBERLAIN AVE N/ISABELLA ST (0002132)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	03 - Rear end	01 - Dry	3	0	0	0
2020-02-29	2020	16:30	BANK ST @ CHAMBERLAIN AVE N/ISABELLA ST (0002132) BANK ST @ CHAMBERLAIN AVE N/ISABELLA ST (0002132)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	03 - Rear end	01 - Dry 01 - Dry	2	0	0	
2020-09-07	2020	21:29	BANK ST @ CHAMBERLAIN AVE N/ISABELLA ST (0002132) BANK ST @ CHAMBERLAIN AVE N/ISABELLA ST (0002132)	01 - Clear	07 - Daylight	01 - Traffic signal	01 - Functioning	02 - Non-fatal injury	02 - Angle	01 - Dry	2	0	0	0
2020-11-03	2020	9:42	BANK ST @ CHAMBERLAIN AVE N/ISABELLA ST (0002132)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	04 - Sideswipe	05 - Packed snow	2	0	0	0
2016-05-20	2020	15:50	CHAMBERLAIN AVE @ KENT ST (0002131)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	04 - Sideswipe	01 - Dry	2	0	0	ő
2018-03-13	2018	2:58	CHAMBERLAIN AVE @ KENT ST (0002131) CHAMBERLAIN AVE @ KENT ST (0002131)	03 - Snow	07 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	07 - SMV other	03 - Loose snow	2	ő	0	0
2020-07-04	2018	12:45	CHAMBERLAIN AVE @ KENT ST (0002131)	01 - Clear	01 - Daylight	12 - IPS	01 - Functioning	03 - P.D. only	03 - Rear end	01 - Dry	2	ŏ	0	ő
2017-08-22	2017	16:28	CHAMBERLAIN AVE btwn KENT ST & TO BE DETERMINED ( 3ZA25A)	01 - Clear	01 - Daylight	10 - No control	0	03 - P.D. only	04 - Sideswipe	02 - Wet	2	0	- 0	0
2017-09-13	2017	9:12	CHAMBERLAIN AVE blwn KENT ST & TO BE DETERMINED (3ZA25A)	01 - Clear	01 - Daylight	10 - No control	0	02 - Non-fatal injury	07 - SMV other	01 - Dry	2	0	ő	ő
2018-10-12	2018	16:01	CHAMBERLAIN AVE btwn KENT ST & TO BE DETERMINED ( 3ZA25A)	01 - Clear	01 - Daylight	10 - No control	0	03 - P.D. only	04 - Sideswipe	01 - Dry	2	0	ō	0
2016-08-30	2016	14:54	CHAMBERLAIN AVE btwn LYON ST S & KENT ST ( 3ZA25C)	01 - Clear	01 - Daylight	10 - No control	0	03 - P.D. only	03 - Rear end	01 - Dry	2	0	0	0
2019-04-05	2019	15:49	CHAMBERLAIN AVE btwn LYON ST S & KENT ST (3ZA25C)	01 - Clear	01 - Daylight	10 - No control	0	03 - P.D. only	04 - Sideswipe	01 - Dry	2	0	0	0



# Transportation Services - Traffic Services Collision Details Report - Public Version

From: January 1, 2014 To: December 31, 2018

Location: BANK	ST @ CHAMB	BERLAIN AVE N/IS	ABELLA ST						
Traffic Control: Tra	ffic signal						Total Collisions:	56	
Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuve	r Vehicle type	First Event	No. Ped
2014-Mar-13, Thu,01:00	Snow	Angle	P.D. only	Loose snow	South	Unknown	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2014-Jul-18, Fri,22:25	Clear	SMV other	P.D. only	Dry	South	Turning left	Automobile, station wagon	Pedestrian	1
2014-Jul-19, Sat,21:01	Clear	Rear end	P.D. only	Dry	South	Going ahead	Passenger van	Other motor vehicle	0
					South	Slowing or stoppin	g Automobile, station wagon	Other motor vehicle	
2014-Jul-31, Thu,11:45	Clear	Sideswipe	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2014-Aug-10, Sun,21:41	Clear	Rear end	Non-fatal injury	Dry	South	Unknown	Unknown	Cyclist	0
					South	Turning left	Bicycle	Other motor vehicle	
2014-Oct-08, Wed,13:59	Clear	Sideswipe	P.D. only	Dry	South	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
2014-Oct-11, Sat,06:51	Clear	Turning movement	Non-fatal injury	Dry	South	Turning left	Automobile, station wagon	Other motor vehicle	0
					North	Going ahead	Motorcycle	Other motor vehicle	
2014-Oct-14, Tue,06:30	Clear	Angle	Non-fatal injury	Dry	East	Slowing or stoppin	g Truck - dump	Other motor vehicle	0
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
2014-Oct-23, Thu,20:20	Clear	SMV other	Non-fatal injury	Dry	South	Turning left	Automobile, station wagon	Pedestrian	1
2015-Feb-08, Sun,08:48	Snow	Rear end	P.D. only	Loose snow	East	Slowing or stoppin	g Automobile, station wagon	Other motor vehicle	0
					East	Stopped	Automobile, station wagon	Other motor vehicle	
2015-Apr-29, Wed, 10:54	Clear	Angle	P.D. only	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2015-May-09, Sat,20:05	Clear	Angle	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Pick-up truck	Other motor vehicle	
2015-Aug-06, Thu,20:59	Clear	SMV other	P.D. only	Dry	North	Turning left	Automobile, station wagon	Ran off road	0

July 30, 2020

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From:	January 1, 2014	To: December 31, 2018
110111.	January 1, 2014	

Traffic Control: Tra	ffic signal						Total Collisions:	56	
ate/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuve	r Vehicle type	First Event	No. Ped
2015-Sep-08, Tue, 19:37	Clear	Angle	P.D. only	Dry	South	Turning left	Bicycle	Other motor vehicle	0
					East	Turning left	Automobile, station wagon	Cyclist	
2015-Sep-12, Sat, 16:42	Rain	Turning movement	P.D. only	Wet	East	Turning left	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Passenger van	Other motor vehicle	
015-Sep-13, Sun,15:43	Clear	Turning movement	P.D. only	Wet	East	Turning left	Delivery van	Other motor vehicle	0
					East	Going ahead	Pick-up truck	Other motor vehicle	
015-Oct-12, Mon,14:45	Clear	Turning movement	P.D. only	Dry	East	Turning left	Pick-up truck	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2015-Oct-12, Mon,17:00	Clear	Sideswipe	P.D. only	Dry	East	Unknown	Unknown	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2015-Oct-14, Wed, 17:01	Clear	Turning movement	P.D. only	Dry	East	Turning left	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
					South	Stopped	Automobile, station wagon	Other motor vehicle	
015-Oct-27, Tue, 15:22	Clear	Sideswipe	P.D. only	Dry	South	Changing lanes	Pick-up truck	Other motor vehicle	0
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
2015-Dec-18, Fri,15:42	Clear	Sideswipe	P.D. only	Dry	South	Stopped	Automobile, station wagon	Other motor vehicle	0
					South	Going ahead	Truck - dump	Other motor vehicle	
2016-Jan-03, Sun,22:14	Clear	Angle	P.D. only	Wet	South	Going ahead	Pick-up truck	Other motor vehicle	0
					East	Going ahead	Pick-up truck	Other motor vehicle	
2016-Jan-11, Mon,01:39	Snow	Angle	P.D. only	Loose snow	East	Turning right	Pick-up truck	Other motor vehicle	0
					South	Going ahead	Municipal transit bus	Other motor vehicle	
2016-Jan-11, Mon,21:08	Clear	SMV other	Non-fatal injury	Wet	North	Turning right	Automobile, station wagon	Pedestrian	1
016-Mar-04, Fri,14:55	Clear	Angle	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Turning left	Pick-up truck	Other motor vehicle	



# Transportation Services - Traffic Services Collision Details Report - Public Version

From: January 1, 2014 To: December 31, 2018

Traffia Control: Tra	ffic cignol						Total Callisteres	FC	
Traffic Control: Tra	nic signal						Total Collisions:		
Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuve	r Vehicle type	First Event	No. Ped
2016-Mar-21, Mon,11:12	Clear	Turning movement	P.D. only	Dry	East	Turning left	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Pick-up truck	Other motor vehicle	
2016-Apr-21, Thu,15:40	Clear	Rear end	P.D. only	Dry	East	Going ahead	Police vehicle	Other motor vehicle	0
					East	Slowing or stoppin	g Passenger van	Other motor vehicle	
2016-May-31, Tue,08:32	Clear	Sideswipe	P.D. only	Dry	North	Unknown	Bicycle	Other motor vehicle	0
					North	Stopped	Automobile, station wagon	Cyclist	
2016-Jun-20, Mon,02:12	Clear	Angle	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Pick-up truck	Other motor vehicle	
2016-Jun-25, Sat,10:38	Clear	Angle	P.D. only	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2016-Jul-04, Mon,00:24	Clear	Angle	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Going ahead	Pick-up truck	Other motor vehicle	
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
2016-Aug-26, Fri,13:33	Clear	Rear end	P.D. only	Dry	North	Slowing or stoppin	g Pick-up truck	Other motor vehicle	0
					North	Slowing or stoppin	g Automobile, station wagon	Other motor vehicle	
2016-Sep-20, Tue, 18:46	Clear	Sideswipe	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Pick-up truck	Other motor vehicle	
2016-Oct-10, Mon,19:17	Clear	Sideswipe	P.D. only	Dry	East	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2016-Oct-13, Thu,10:56	Clear	Sideswipe	P.D. only	Dry	East	Changing lanes	Pick-up truck	Other motor vehicle	0
					East	Going ahead	Pick-up truck	Other motor vehicle	
2016-Oct-30, Sun,15:08	Clear	Angle	Non-fatal injury	Dry	South	Going ahead	Pick-up truck	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	

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Traffic Control: Tra	ffic signal						Total Collisions:	56	
ate/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuve	r Vehicle type	First Event	No. Ped
2016-Nov-05, Sat,13:49	Clear	Angle	P.D. only	Dry	South	Going ahead	Pick-up truck	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2016-Dec-31, Sat,15:23	Snow	Rear end	P.D. only	Loose snow	North	Slowing or stoppin	g Automobile, station wagon	Other motor vehicle	0
					North	Stopped	Pick-up truck	Other motor vehicle	
2017-Feb-27, Mon,14:49	Clear	Angle	P.D. only	Dry	North	Turning right	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2017-Apr-08, Sat,15:02	Clear	Turning movement	P.D. only	Dry	East	Turning left	Pick-up truck	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2017-Apr-29, Sat,13:25	Clear	Sideswipe	P.D. only	Dry	South	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					South	Changing lanes	Automobile, station wagon	Other motor vehicle	
2017-Jul-11, Tue,17:16	Rain	Rear end	P.D. only	Wet	East	Slowing or stoppin	g Automobile, station wagon	Other motor vehicle	0
					East	Stopped	Pick-up truck	Other motor vehicle	
2017-Jul-16, Sun,08:49	Clear	Angle	Non-fatal injury	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2017-Jul-16, Sun,10:56	Clear	Angle	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
2017-Aug-24, Thu,20:58	Clear	Sideswipe	P.D. only	Dry	East	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2017-Sep-13, Wed,05:30	Clear	Angle	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Pick-up truck	Other motor vehicle	
2017-Sep-23, Sat,14:50	Clear	Angle	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2017-Dec-15, Fri,16:39	Snow	Sideswipe	P.D. only	Wet	East	Changing lanes	Pick-up truck	Other motor vehicle	0
					East	Turning left	Truck and trailer	Other motor vehicle	



# Transportation Services - Traffic Services Collision Details Report - Public Version

From: January 1, 2014 To: December 31, 2018

Location: BANK	ST @ CHAMB	ERLAIN AVE N/IS	ABELLA ST						
Traffic Control: Tra	ffic signal						Total Collisions:	56	
Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuve	er Vehicle type	First Event	No. Ped
2018-Jan-16, Tue,20:05	Clear	Turning movement	P.D. only	Slush	South	Turning left	Pick-up truck	Other motor vehicle	0
					North	Going ahead	Pick-up truck	Other motor vehicle	
2018-Feb-06, Tue, 20:50	Clear	Turning movement	P.D. only	Wet	South	Turning left	Automobile, station wagon	Other motor vehicle	0
					North	Going ahead	Automobile, station wagon	Other motor vehicle	
2018-May-11, Fri,15:08	Clear	Sideswipe	P.D. only	Dry	East	Overtaking	Automobile, station wagon	Other motor vehicle	0
					East	Slowing or stoppin	g Automobile, station wagon	Other motor vehicle	
					East	Stopped	Automobile, station wagon	Other motor vehicle	
2018-May-14, Mon,10:32	Clear	Angle	Non-fatal injury	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2018-May-26, Sat,11:40	Clear	Angle	Non-fatal injury	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2018-Jul-27, Fri,14:15	Clear	Rear end	P.D. only	Dry	North	Unknown	Unknown	Other motor vehicle	0
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2018-Aug-30, Thu,13:20	Clear	Turning movement	P.D. only	Dry	East	Turning left	Delivery van	Other motor vehicle	0
					East	Turning left	Passenger van	Other motor vehicle	
2018-Oct-18, Thu,14:13	Clear	Rear end	P.D. only	Dry	East	Going ahead	Pick-up truck	Other motor vehicle	0
					East	Stopped	Automobile, station wagon	Other motor vehicle	

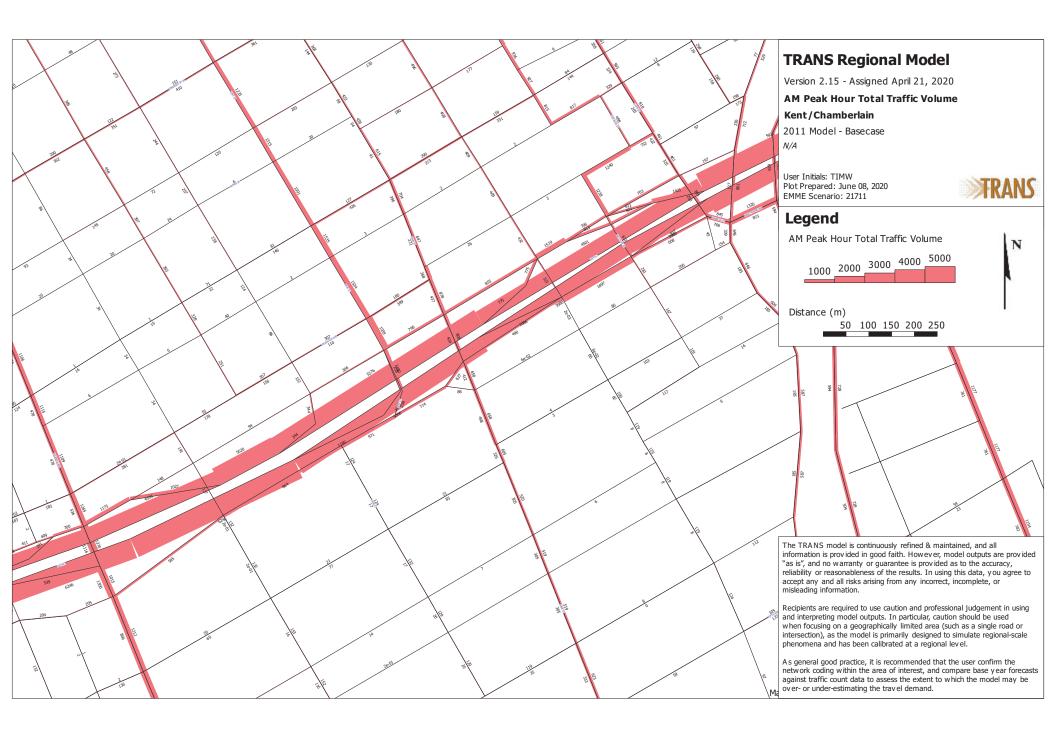
July 30, 2020

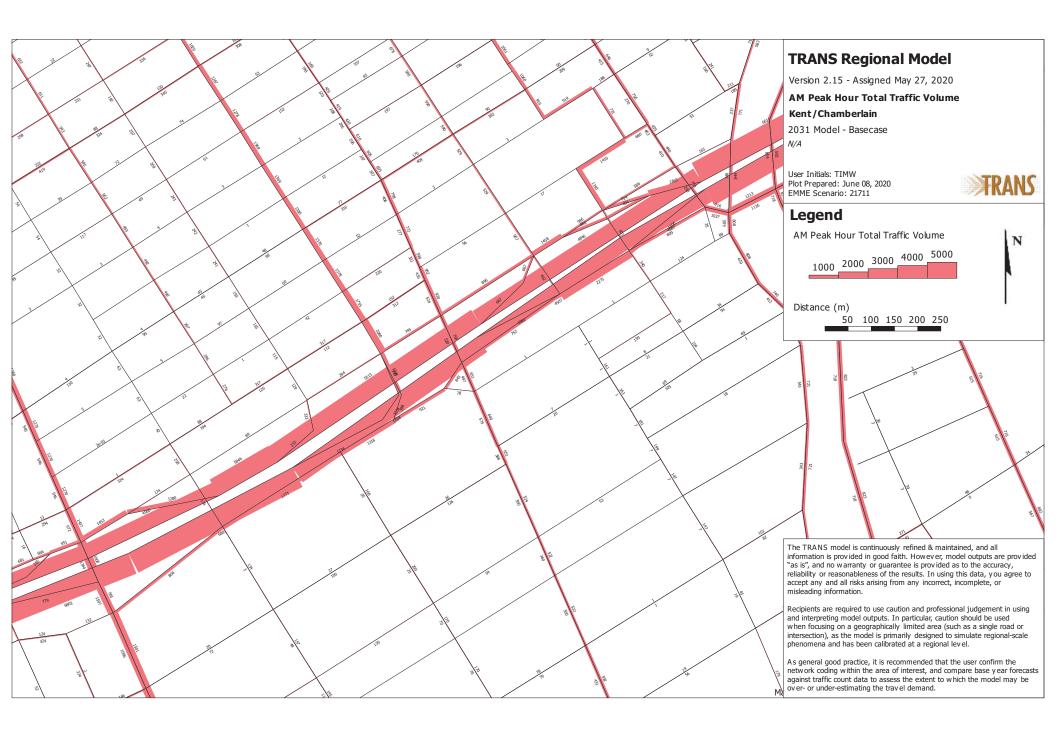
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TRANS Model Plots







# Appendix F

Synchro Intersection Worksheets – 2024 Future Background Conditions



Lanes, Volumes, Til 1: HWY 417 OR/Lyd		atherin	е					2	024 Fi	uture I		r <b>ound</b> 16-2024
	≯	-	$\mathbf{\hat{v}}$	4	+	*	•	Ť	1	1	Ļ	4
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					4 <b>†</b> 1						•	7
Traffic Volume (vph)	0	0	0	222	219	0	0	0	0	0	258	127
Future Volume (vph)	0	0	0	222	219	0	0	0	0	0	258	127
Satd. Flow (prot)	0	0	0	0	4645	0	0	0	0	0	1745	1483
Flt Permitted					0.975							
Satd. Flow (perm)	0	0	0	0	4612	0	0	0	0	0	1745	1454
Satd. Flow (RTOR)					222							127
Lane Group Flow (vph)	0	0	0	0	441	0	0	0	0	0	258	127
Turn Type				Perm	NA						NA	Perm
Protected Phases					6						4	
Permitted Phases				6								4
Detector Phase				6	6						4	4
Switch Phase												
Minimum Initial (s)				10.0	10.0						10.0	10.0
Minimum Split (s)				26.2	26.2						28.3	28.3
Total Split (s)				40.0	40.0						35.0	35.0
Total Split (%)				53.3%	53.3%						46.7%	46.7%
Yellow Time (s)				3.3	3.3						3.3	3.3
All-Red Time (s)				1.9	1.9						2.0	2.0
Lost Time Adjust (s)					0.0						0.0	0.0
Total Lost Time (s)					5.2						5.3	5.3
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode				C-Max	C-Max						Max	Мах
Act Effct Green (s)				o max	34.8						29.7	29.7
Actuated g/C Ratio					0.46						0.40	0.40
v/c Ratio					0.20						0.37	0.19
Control Delay					10.5						18.1	3.9
Queue Delay					0.0						0.0	0.0
Total Delay					10.5						18.1	3.9
LOS					B						B	A
Approach Delay					10.5						13.4	
Approach LOS					B						B	
Queue Length 50th (m)					17.3						25.1	0.0
Queue Length 95th (m)					26.1						42.7	9.2
Internal Link Dist (m)		117.8			157.8			120.4			277.6	0.2
Turn Bay Length (m)		111.0			107.0			120.4			211.0	
Base Capacity (vph)					2258						691	652
Starvation Cap Reductn					0						0	002
Spillback Cap Reductn					0						0	0
Storage Cap Reductn					0						0	0
Reduced v/c Ratio					0.20						0.37	0.19
Intersection Summary												
Cycle Length: 75												_
Actuated Cycle Length: 75												
Offset: 48 (64%), Referenced	to phase	2: and 6:	WBTL, S	tart of G	een							
Natural Cycle: 55												
Control Type: Actuated-Coor	dinated											

Synchro 10 Light Report Page 1 Lanes, Volumes, Timings 1: HWY 417 OR/Lyon & Catherine 2024 Future Background 05-16-2024

 Maximum v/c Ratio: 0.37
 Intersection LOS: B

 Intersection Capacity Utilization 47.6%
 ICU Level of Service A

 Analysis Period (min) 15
 ICU Level of Service A

Splits and Phases: 1: HWY 417 OR/Lyon & Catherine

30-48 Chamberlain AM Peak Hour



	≯	-	$\mathbf{r}$	4	-		-	1	1	1	÷.	4
_ane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBF
ane Configurations					<b>≜</b> †}	1		4412				
raffic Volume (vph)	0	0	0	0	389	537	54	1373	0	0	0	
uture Volume (vph)	0	0	0	0	389	537	54	1373	0	0	0	
Satd. Flow (prot)	0	0	0	0	2916	1350	0	4755	0	0	0	
It Permitted								0.998				
Satd. Flow (perm)	0	0	0	0	2916	1262	0	4750	0	0	0	
Satd. Flow (RTOR)								70				
ane Group Flow (vph)	0	0	0	0	636	290	0	1427	0	0	0	
Furn Type					NA	Perm	Perm	NA				
Protected Phases					6			8				
Permitted Phases						6	8					
Detector Phase					6	6	8	8				
Switch Phase												
Vinimum Initial (s)					10.0	10.0	10.0	10.0				
Vinimum Split (s)					27.8	27.8	17.8	17.8				
Total Split (s)					32.0	32.0	38.0	38.0				
Total Split (%)					42.7%	42.7%	50.7%	50.7%				
(ellow Time (s)					3.3	3.3	3.3	3.3				
All-Red Time (s)					2.5	2.5	2.5	2.5				
ost Time Adjust (s)					0.0	0.0		0.0				
Total Lost Time (s)					5.8	5.8		5.8				
_ead/Lag					Lag	Lag						
_ead-Lag Optimize?					Ŭ	Ū						
Recall Mode					C-Max	C-Max	Max	Max				
Act Effct Green (s)					26.2	26.2		32.2				
Actuated g/C Ratio					0.35	0.35		0.43				
//c Ratio					0.62	0.66		0.69				
Control Delay					26.3	30.1		18.5				
Queue Delay					0.0	0.0		0.0				
Total Delay					26.3	30.1		18.5				
LOS					С	С		В				
Approach Delay					27.5			18.5				
Approach LOS					С			В				
Queue Length 50th (m)					43.3	40.0		54.6				
Queue Length 95th (m)					m60.6	m57.1		69.8				
nternal Link Dist (m)		157.8			130.6			47.0			56.6	
Furn Bay Length (m)												
Base Capacity (vph)					1018	440		2079				
Starvation Cap Reductn					0	0		0				
Spillback Cap Reductn					0	0		0				
Storage Cap Reductn					0	0		0				
Reduced v/c Ratio					0.62	0.66		0.69				
ntersection Summary												
Cycle Length: 75												
Actuated Cycle Length: 75												
Offset: 15 (20%), Referenced	to phase	2: and 6:	NRT Sta	rt of Cro	on.							

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Lanes, Volumes, Timings	2024 Future Background
2: Kent & Catherine	05-16-2024

Lane Group	Ø5		
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Satd. Flow (RTOR)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	5		
Permitted Phases			
Detector Phase			
Switch Phase			
Minimum Initial (s)	1.0		
Minimum Split (s)	5.0		
Total Split (s)	5.0		
Total Split (%)	7%		
Yellow Time (s)	2.0		
All-Red Time (s)	0.0		
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lead		
Lead-Lag Optimize?			
Recall Mode	Max		
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (m)			
Queue Length 95th (m)			
Internal Link Dist (m)			
Turn Bay Length (m)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

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Lanes, Volumes, Timings 2: Kent & Catherine		2024 Future Background 05-16-2024
Maximum v/c Ratio: 0.69		
Intersection Circuit Delays 22.0	Internetion LOC: C	

Intersection oignar Delay. 22.0	Intersection EOO. O	
Intersection Capacity Utilization 65.6%	ICU Level of Service C	
Analysis Period (min) 15		
m Volume for 95th percentile queue is metered by	y upstream signal.	
Splits and Phases: 2: Kent & Catherine		

●	<\$ <sup>†</sup> ∞8
5 s 32 s	38 s

	≯		Ļ		1	1		
	-	EDT					<i><i><i>α</i><sub>1</sub></i></i>	
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø4	
Lane Configurations	0	<b>*</b>	0	0	0	0		
Traffic Volume (vph)	0	746	0	0	0	0		
Future Volume (vph)	0	746	0	0	0	0		
Satd. Flow (prot) Flt Permitted	0	3316	0	0	0	0		
Satd. Flow (perm)	0	3316	0	0	0	0		
Satd. Flow (RTOR)	_			_				
Lane Group Flow (vph)	0	746	0	0	0	0		
Turn Type		NA						
Protected Phases Permitted Phases		2					4	
Detector Phase		2						
Switch Phase								
Minimum Initial (s)	_	10.0					10.0	
Minimum Split (s)		36.0					21.0	
Total Split (s)		36.0					21.0	
Total Split (%)		63.2%					37%	
Yellow Time (s)		3.3					3.0	
All-Red Time (s)		1.7					1.0	
Lost Time Adjust (s)		0.0						
Total Lost Time (s)		5.0						
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode		Min					None	
Act Effct Green (s)		32.6						
Actuated g/C Ratio		0.63						
v/c Ratio		0.36						
Control Delay		7.5						
Queue Delay		0.0						
Total Delay		7.5						
LOS		А						
Approach Delay		7.5						
Approach LOS		А						
Queue Length 50th (m)		21.4						
Queue Length 95th (m)		31.0						
Internal Link Dist (m)		270.2	176.4		31.3			
Turn Bay Length (m)								
Base Capacity (vph)		2163						
Starvation Cap Reductn		0						
Spillback Cap Reductn		0						
Storage Cap Reductn		0						
Reduced v/c Ratio		0.34						
Intersection Summary								
Cycle Length: 57								
Actuated Cycle Length: 51.5								
Natural Cycle: 60	_							
Control Type: Semi Act-Uncoo	rd							
Maximum v/c Ratio: 0.36								

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Lanes, Volumes, Timings 3: Chamberlain & Kent	2024 Future Backgroun 05-16-20;
Intersection Signal Delay: 7.5	Intersection LOS: A
Intersection Capacity Utilization 25.9%	ICU Level of Service A
Analysis Period (min) 15	
Splits and Phases: 3: Chamberlain & Kent	
<b>→</b> ø2	** k_04
36.0	21 c

	≯	-	$\mathbf{i}$	1	+		1	<b>†</b>	1	1	1	~
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SB
ane Configurations					4 <b>†</b> ₽			-fħ			<b>≜</b> †}	
Traffic Volume (vph)	0	0	0	160	582	189	272	626	0	0	385	11
Future Volume (vph)	0	0	0	160	582	189	272	626	0	0	385	11
Satd. Flow (prot)	0	0	0	0	4481	0	0	3266	0	0	3011	
-It Permitted					0.991			0.648				
Satd. Flow (perm)	0	0	0	0	4429	0	0	2077	0	0	3011	
Satd. Flow (RTOR)					81						47	
Lane Group Flow (vph)	0	0	0	0	931	0	0	898	0	0	495	
Turn Type				Perm	NA		pm+pt	NA			NA	
Protected Phases					8		5	2			6	
Permitted Phases				8			2					
Detector Phase				8	8		5	2			6	
Switch Phase												
Minimum Initial (s)				10.0	10.0		5.0	10.0			10.0	
Vinimum Split (s)				23.6	23.6		10.4	21.4			21.4	
Total Split (s)				25.0	25.0		15.0	40.0			25.0	
Total Split (%)				33.3%	33.3%		20.0%	53.3%			33.3%	
Yellow Time (s)				3.3	3.3		3.3	3.3			3.3	
All-Red Time (s)				2.3	2.3		2.1	2.1			2.1	
Lost Time Adjust (s)					0.0			0.0			0.0	
Total Lost Time (s)					5.6			5.4			5.4	
Lead/Lag				Lag	Lag						Lag	
Lead-Lag Optimize?				Yes	Yes						Yes	
Recall Mode				Max	Max		Max	C-Max			C-Max	
Act Effct Green (s)					19.4			34.6			19.6	
Actuated g/C Ratio					0.26			0.46			0.26	
v/c Ratio					0.77			0.81			0.60	
Control Delay					28.6			12.0			25.5	
Queue Delay					0.0			0.0			0.1	
Total Delay					28.6			12.0			25.6	
LOS					С			В			С	
Approach Delay					28.6			12.0			25.6	
Approach LOS					С			В			С	
Queue Length 50th (m)					40.8			10.3			29.0	
Queue Length 95th (m)					54.9			m28.8			43.9	
Internal Link Dist (m)		130.6			383.3			80.8			138.4	
Turn Bay Length (m)												
Base Capacity (vph)					1205			1110			821	
Starvation Cap Reductn					0			0			0	
Spillback Cap Reductn					0			0			27	
Storage Cap Reductn					0			0			0	
Reduced v/c Ratio					0.77			0.81			0.62	
ntersection Summary												
Cycle Length: 75												
Actuated Cycle Length: 75												
Offset: 70 (93%), Reference	d to phase	2:NBTL a	and 6:SB	T, Start c	of Green							
Natural Cycle: 70												
Control Type: Actuated-Coor	dinated											

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Lanes,	Volumes	, Timings
4: Bank	& Cathe	erine

2024 Future Background 05-16-2024

Lane Group	Ø7	Ø9	Ø13
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Satd. Flow (RTOR)			
Lane Group Flow (vph)	_		
Turn Type			
Protected Phases	7	9	13
Protected Phases Permitted Phases	- 1	9	13
Detector Phase			
Switch Phase	4.0	1.0	4.0
Minimum Initial (s)	1.0	1.0	1.0
Minimum Split (s)	5.0	5.0	5.0
Total Split (s)	5.0	5.0	5.0
Total Split (%)	7%	7%	7%
Yellow Time (s)	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lead		Lead
Lead-Lag Optimize?	Yes		Yes
Recall Mode	Max	Max	Max
Act Effct Green (s)		man	man
Actuated g/C Ratio		_	_
v/c Ratio			
Control Delay			
Queue Delay	_	_	_
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (m)			
Queue Length 95th (m)			
Internal Link Dist (m)			
Turn Bay Length (m)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Spillback Cap Reductn Storage Cap Reductn Reduced v/c Ratio			
Storage Cap Reductn			

Lanes, Volumes, Timings 4: Bank & Catherine		2024 Future Background 05-16-2024
Maximum v/c Ratio: 0.81		
Intersection Signal Delay: 21.5	Intersection LOS: C	
Intersection Capacity Utilization 79.5%	ICU Level of Service D	

Analysis Period (min) 15 m Volume for 95th percentile queue is metered by upstream signal.

#### Splits and Phases: 4: Bank & Catherine



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30-48 Chamberlain AM Peak Hour

	۶	-	$\mathbf{i}$	1	-	*	1	1	1	1	÷.	-
ane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SB
ane Configurations		<b>4</b> ₽	1					<b>↑1</b> ≽		ሻ	•	
Traffic Volume (vph)	81	533	82	0	0	0	0	834	162	192	395	
Future Volume (vph)	81	533	82	0	0	0	0	834	162	192	395	
Satd. Flow (prot)	0	3292	1483	0	0	0	0	3137	0	1658	1745	
Flt Permitted		0.993								0.180		
Satd. Flow (perm)	0	3285	1334	0	0	0	0	3137	0	306	1745	
Satd. Flow (RTOR)			134					32				
ane Group Flow (vph)	0	614	82	0	0	0	0	996	0	192	395	
Furn Type	Perm	NA	Perm					NA		pm+pt	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4							6		
Detector Phase	4	4	4					2		1	6	
Switch Phase												
Vinimum Initial (s)	10.0	10.0	10.0					10.0		5.0	10.0	
Vinimum Split (s)	26.2	26.2	26.2					23.1		11.1	23.1	
Total Split (s)	29.0	29.0	29.0					31.0		15.0	46.0	
Total Split (%)	38.7%	38.7%	38.7%					41.3%		20.0%	61.3%	
Yellow Time (s)	3.3	3.3	3.3					3.0		3.0	3.0	
All-Red Time (s)	2.9	2.9	2.9					3.1		3.1	3.1	
ost Time Adjust (s)		0.0	0.0					0.0		0.0	0.0	
Total Lost Time (s)		6.2	6.2					6.1		6.1	6.1	
_ead/Lag								Lead		Lag		
_ead-Lag Optimize?								Yes		Yes		
Recall Mode	None	None	None					C-Max		None	C-Max	
Act Effct Green (s)		19.2	19.2					28.5		43.5	43.5	
Actuated g/C Ratio		0.26	0.26					0.38		0.58	0.58	
//c Ratio		0.73	0.19					0.82		0.57	0.39	
Control Delay		30.7	2.2					28.8		24.6	8.0	
Queue Delay		0.0	0.0					0.0		0.0	1.1	
Total Delay		30.7	2.2					28.8		24.6	9.1	
LOS		С	A					С		С	A	
Approach Delay		27.3						28.8			14.1	
Approach LOS		С						С			В	
Queue Length 50th (m)		41.1	0.0					64.5		11.9	19.7	
Queue Length 95th (m)		54.8	3.3					#107.6		m33.3	m27.6	
nternal Link Dist (m)		176.4			219.4			129.7			80.8	
Turn Bay Length (m)			30.0									
Base Capacity (vph)		998	498					1210		337	1011	
Starvation Cap Reductn		0	0					0		0	385	
Spillback Cap Reductn		0	0					0		0	0	
Storage Cap Reductn		0	0					0		0	0	
Reduced v/c Ratio		0.62	0.16					0.82		0.57	0.63	
ntersection Summary												
Cycle Length: 75												
Actuated Cycle Length: 75												
Offset: 1 (1%), Referenced	to phase 2	NBT and	6:SBTL, S	Start of G	reen							

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5: Bank & Chamberlain/Isabella		05-16-2024				
Maximum v/c Ratio: 0.82						
Intersection Signal Delay: 24.6	Intersection LOS: C					
Intersection Capacity Utilization 78.8%	ICU Level of Service D					
Analysis Period (min) 15						
# 95th percentile volume exceeds capacity, queue may be longer.						
Queue shown is maximum after two cycles.						
m Volume for 95th percentile queue is metered by upstream signal.						

Splits and Phases: 5: Bank & Chamberlain/Isabella

Lanes, Volumes, Timings

Splits and Phases. 5. Bank	& Chamberlain/Isabella		
Ø2 (R)		Ø1	<b>₩</b> Ø4
31 s	15	S	29 s
Ø6 (R)			
46 s			

30-48 Chamberlain AM Peak Hour

2024 Future Background

Lanes, Volumes, Ti 1: HWY 417 OR/Lyd	0	atherin	е					2	024 Fi	uture l		round 16-2024
	≯	-	$\mathbf{\hat{v}}$	4	+	*	1	Ť	1	1	Ļ	4
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					441>						<b>†</b>	1
Traffic Volume (vph)	0	0	0	219	498	0	0	0	0	0	392	263
Future Volume (vph)	0	0	0	219	498	0	0	0	0	0	392	263
Satd, Flow (prot)	0	0	0	0	4693	0	0	0	0	0	1745	1483
Flt Permitted	Ŭ	Ŭ	Ű	Ŭ	0.985	· ·	Ŭ	Ŭ	Ŭ	Ŭ		1100
Satd. Flow (perm)	0	0	0	0	4657	0	0	0	0	0	1745	1443
Satd. Flow (RTOR)		-	-	-	153	-	-	-	-	-		98
Lane Group Flow (vph)	0	0	0	0	717	0	0	0	0	0	392	263
Turn Type	Ŭ	Ŭ	Ű	Perm	NA	v	Ŭ	Ŭ	Ŭ	Ŭ	NA	Perm
Protected Phases				T OIIII	6						4	T OIIII
Permitted Phases				6	Ŭ							4
Detector Phase				6	6						4	4
Switch Phase				U	Ŭ							-
Minimum Initial (s)				10.0	10.0						10.0	10.0
Minimum Split (s)				26.2	26.2						28.3	28.3
Total Split (s)				28.0	28.0						47.0	47.0
Total Split (%)				37.3%	37.3%						62.7%	62.7%
Yellow Time (s)				3.3	3.3						3.3	3.3
All-Red Time (s)				1.9	1.9						2.0	2.0
Lost Time Adjust (s)				1.9	0.0						0.0	2.0
, ()					5.2						5.3	5.3
Total Lost Time (s) Lead/Lag					J.Z						5.5	5.5
Lead-Lag Optimize?												
Recall Mode				C-Max	C-Max						Мах	Мах
Act Effct Green (s)				U-IVIdX	22.8						41.7	41.7
Actuated g/C Ratio					0.30						0.56	0.56
v/c Ratio					0.30						0.30	0.30
Control Delav					16.1						11.1	6.5
					0.0						0.0	0.0
Queue Delay					16.1						11.1	6.5
Total Delay					10.1 B						B	
LOS Approach Delay					В 16.1						9.3	A
Approach Delay					10.1 B						9.3 A	
Approach LOS					9.3						29.2	40.0
Queue Length 50th (m)					9.3						47.0	10.8 22.7
Queue Length 95th (m)		117.8			157.8			120.4			277.6	22.1
Internal Link Dist (m)		111.0			157.0			120.4			211.0	
Turn Bay Length (m)					1522						970	845
Base Capacity (vph)					1522						970	
Starvation Cap Reductn					0						0	0
Spillback Cap Reductn					0						0	0
Storage Cap Reductn Reduced v/c Ratio					0.47						0.40	0.31
					0.47						0.40	0.31
Intersection Summary												
Cycle Length: 75												
Actuated Cycle Length: 75				-								
Offset: 24 (32%), Referenced	d to phase	2: and 6:	WBTL, S	Start of G	reen							
Natural Cycle: 55												
Control Type: Actuated-Coor	dinated											

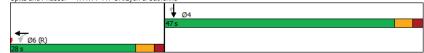
Synchro 10 Light Report Page 1 Lanes, Volumes, Timings 1: HWY 417 OR/Lyon & Catherine 2024 Future Background 05-16-2024

 Maximum v/c Ratio: 0.47
 Intersection LOS: B

 Intersection Capacity Utilization 50.0%
 ICU Level of Service A

 Analysis Period (min) 15
 Intersection LOS: B

Splits and Phases: 1: HWY 417 OR/Lyon & Catherine



30-48 Chamberlain PM PEAK HOUR

Ane Configurations         I <thi< th="">         I         <thi< th=""></thi<></thi<>		≯	-	$\mathbf{r}$	1	-		-	1	1	1	÷.	4
Iraffic Volume (vph)       0       0       0       648       316       25       742       0       0       0         Uture Volume (vph)       0       0       0       648       316       25       742       0	ane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBI
Tarfic Volume (vph)       0       0       0       648       316       25       742       0       0       0         uture Volume (vph)       0       0       0       3143       1350       0       4755       0       0       0         Ref (roty)       0       0       0       3143       1350       0       4755       0       0       0         Stad. Flow (perm)       0       0       0       3143       1350       0       4752       0	ane Configurations					<b>≜</b> †}	1		4412				
Said. Flow (prot)       0       0       0       3143       1350       0       4755       0       0       0         It Permitted       0.939       70       0       0       0       343       1247       0       4752       0       0       0         Said. Flow (RTOR)       0       0       0       843       1247       0       4752       0       0       0         Said. Flow (RTOR)       0       0       0       680       284       0       767       0       0       0         ane Group Flow (vph)       0       0       0       680       8       9 <td>raffic Volume (vph)</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td></td> <td>316</td> <td>25</td> <td></td> <td>0</td> <td>0</td> <td>0</td> <td></td>	raffic Volume (vph)	0	0	0	0		316	25		0	0	0	
itt Permitted       0       0       0       0       3143       1247       0       4752       0       0       0         Sald. Flow (prom)       0 <td>uture Volume (vph)</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>648</td> <td>316</td> <td>25</td> <td>742</td> <td>0</td> <td>0</td> <td>0</td> <td></td>	uture Volume (vph)	0	0	0	0	648	316	25	742	0	0	0	
Said. Flow (prm)       0       0       0       3143       1247       0       4752       0       0       0         said. Flow (RTOR)       70       70       70       0 <t< td=""><td>Satd. Flow (prot)</td><td>0</td><td>0</td><td>0</td><td>0</td><td>3143</td><td>1350</td><td>0</td><td>4755</td><td>0</td><td>0</td><td>0</td><td></td></t<>	Satd. Flow (prot)	0	0	0	0	3143	1350	0	4755	0	0	0	
Said. Flow (RTOR)       0       0       0       680       284       0       767       0       0       0         ane Group Flow (vph)       0       0       0       680       284       0       767       0       0       0         Vin Type       NA       Perm       NA       Perm       NA         Protected Phases       6       8       8       8         Permited Phases       6       6       8       8         Minimum Initial (s)       10.0       10.0       10.0       10.0       10.0         Jinimum Spitt (s)       27.8       27.8       17.8       17.8       17.8       17.8         Total Spitt (s)       33.3       3.4       4.1 <td>It Permitted</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>0.998</td> <td></td> <td></td> <td></td> <td></td>	It Permitted								0.998				
ane Group Flow (vph)       0       0       0       680       284       0       767       0       0       0         fum Type       NA       Perm       Perm       NA       Perm       NA         Parmited Phases       6       8       8       5       5       5         Permited Phases       6       8       8       5 <td< td=""><td>Satd. Flow (perm)</td><td>0</td><td>0</td><td>0</td><td>0</td><td>3143</td><td>1247</td><td>0</td><td>4752</td><td>0</td><td>0</td><td>0</td><td></td></td<>	Satd. Flow (perm)	0	0	0	0	3143	1247	0	4752	0	0	0	
Turn Type         NA         Perm         NA           Vrotected Phases         6         8           Permitted Phases         6         8           Detector Phase         6         6           Switch Phase         6         6           Uninimum Spit (s)         10.0         10.0         10.0           Minimum Spit (s)         27.8         27.8         17.8         17.8           Total Spit (s)         38.0         38.0         32.0         32.0           Total Spit (s)         50.7%         50.7%         42.7%         42.7%           Fellow Time (s)         3.3         3.3         3.3         3.3           UR-Red Time (s)         2.5         2.5         2.5         2.5           cost Time Adjus (s)         0.0         0.0         0.0         0.0           Otal Lost Time (s)         5.8         5.8         5.8         5.8           eead/Lag         Lag         Lag         Lag         Lag         Lag           eead/Lag         Lag	Satd. Flow (RTOR)								70				
Brotected Phases         6         8           Permitted Phases         6         8           Detector Phase         6         6         8           Switch Phase         6         6         8           Winimum Initial (s)         10.0         10.0         10.0           Vinimum Split (s)         27.8         27.8         17.8           Total Split (s)         38.0         38.0         32.0         32.0           Total Split (s)         33.3         3.3         3.3         3.3         3.3           URR of Time (s)         2.5<	ane Group Flow (vph)	0	0	0	0	680	284	0	767	0	0	0	
Fermitted Phase         6         8           Detector Phase         6         6         8           Witch Phase         10.0         10.0         10.0           Minimum Initial (s)         10.0         10.0         10.0           Minimum Split (s)         27.8         27.8         17.8           Total Split (s)         38.0         38.0         32.0         32.0           Total Split (s)         50.7%         50.7%         42.7%         42.7%           Vella Split (s)         50.7%         52.5         2.5         2.5           Cotal Split (%)         0.0         0.0         0.0         0.0           Time (s)         2.5         2.5         2.5         2.5         2.5           Cost Time Adjust (s)         0.0         0.0         0.0         0.0         0.0           Total Lost Time (s)         5.8         5.8         5.8         5.8         5.8         5.8           cead-Lag Optimize?         Recall Mode         C-Max         Max         Max         Max           Vice Ratio         0.50         0.53         0.45         0.43         0.35         ////////////////////////////////////	Turn Type					NA	Perm	Perm	NA				
Detector Phase         6         6         8         8           Witch Phase         10.0         10.0         10.0         10.0           Minimum Split (s)         27.8         27.8         17.8         17.8           Total Split (s)         27.8         27.8         17.8         17.8           Total Split (s)         38.0         32.0         32.0         50.7%         42.7%           (ellow Time (s)         3.3         3.3         3.3         3.3         3.3         3.3           VII-Red Time (s)         2.5         2.6         2.7	Protected Phases					6			8				
Switch Phase         Jinimum Initial (s)       10.0       10.0       10.0       10.0         Jinimum Split (s)       27.8       27.8       17.8       17.8         Total Split (s)       38.0       38.0       32.0       32.0         Total Split (s)       50.7%       50.7%       42.7%       42.7%         Viewed Time (s)       2.5       2.5       2.5       2.5         Soat Time Adjust (s)       0.0       0.0       0.0         Total Lost Time (s)       5.8       5.8       5.8         cad-Lag Optimize?       Lag       Lag       Lag         Recall Mode       C-Max       C-Max       Max       Max         Vet Effor Green (s)       32.2       2.2       2.6.2       2.6.2         Actuated g/C Ratio       0.43       0.43       0.35       6.6       18.0         Jueue Delay       0.0       0.0       0.0       0.0       10.0	Permitted Phases						6	8					
Minimum Initial (s)       10.0       10.0       10.0       10.0         Minimum Split (s)       27.8       27.8       17.8       17.8         Total Split (s)       38.0       32.0       32.0         Total Split (s)       50.7%       50.7%       42.7%         (ellow Time (s)       2.5       2.5       2.5       2.5         vector Ime (s)       2.5       2.5       2.5       2.5         vector Ime (s)       5.8       5.8       5.8         cad-Lag Optimize?       2       2.2       2.6.2         eead-Mode       C-Max       C-Max       Max         Act Effet Green (s)       32.2       32.2       2.6.2         vectad g/C Ratio       0.43       0.43       0.35       0.45         Control Delay       14.3       16.6       18.0       16.0       18.0         Vec Ratio       0.50       0.53       0.45       16.6       18.0       16.6       18.0         OS       B       B       B       18.0       16.6       18.0       16.6       18.0       16.6       18.0       16.6       18.0       16.6       18.0       16.6       16.0       16.0       16.0       16.0 <td>Detector Phase</td> <td></td> <td></td> <td></td> <td></td> <td>6</td> <td>6</td> <td>8</td> <td>8</td> <td></td> <td></td> <td></td> <td></td>	Detector Phase					6	6	8	8				
vilnimum Split (s)       27.8       27.8       17.8       17.8         Total Split (s)       38.0       38.0       32.0       32.0         Total Split (%)       50.7%       42.7%       42.7%         Fellow Time (s)       3.3       3.3       3.3         All-Red Time (s)       2.5       2.5       2.5       2.5         cost Time Adjust (s)       0.0       0.0       0.0       0.0         colal Lost Time (s)       5.8       5.8       5.8         .ead/Lag       Lag       Lag       .ead-Lag Optimize?         Recall Mode       C-Max       C-Max       Max         Ket Effed Green (s)       32.2       2.6.2       .ead-Lag Optimize?         Recall Mode       C-Max       C-Max       Max       Max         Valt Effed Green (s)       32.2       2.2       2.6.2	Switch Phase												
Total Split (%)       38.0       32.0       32.0         Total Split (%)       50.7%       50.7%       42.7%         Cellow Time (s)       3.3       3.3       3.3         All-Red Time (s)       2.5       2.5       2.5         .ost Time Adjust (s)       0.0       0.0       0.0         Total Lost Time (s)       5.8       5.8       5.8         .ead/Lag       Lag       Lag          .ead/Lag       Lag       Lag          .ead/Lag       C-Max       C-Max       Max         vctated gO ptimize?           Recall Mode       C-Max       C-Max       Max         vct Effed Green (s)       32.2       22.2       26.2         Actuated g/C Ratio       0.43       0.43       0.35         //c Ratio       0.50       0.53       0.45         Control Delay       14.3       16.6       18.0         Queue Delay       10.0       0.0       0.0         OS       B       B       B       D         Approach LOS       B       B       B       D         Queue Length S0th (m)       157.8       130.6       43.8	Vinimum Initial (s)					10.0	10.0	10.0	10.0				
Total Split (%)       50.7%       50.7%       42.7%       42.7%         (ellow Time (s)       3.3       3.3       3.3       3.3       3.3         NI-Red Time (s)       2.5       2.5       2.5       2.5       2.5         cost Time Adjust (s)       0.0       0.0       0.0       0.0         Total Lost Time (s)       5.8       5.8       5.8       5.8         cad-Lag Optimize?       Lag       Lag       Lag       Lag         vead-Lag (C Ratio       0.43       0.43       0.35       (////////////////////////////////////	/inimum Split (s)					27.8	27.8	17.8	17.8				
Total Split (%)       50.7%       50.7%       42.7%       42.7%         fellow Time (s)       3.3       3.3       3.3       3.3         NIR-Red Time (s)       2.5       2.5       2.5       2.5         cost Time Adjust (s)       0.0       0.0       0.0         Total Lost Time (s)       5.8       5.8       5.8         cad/Lag       Lag       Lag       Lag         ead/Lag Optimize?       32.2       32.2       2.6.2         Actuated g/C Ratio       0.43       0.43       0.35         /c/ Ratio       0.50       0.53       0.45         Control Delay       14.3       16.6       18.0         Dueue Delay       0.0       0.0       0.0         Total Delay       14.3       16.6       18.0         Dueue Delay       0.0       0.0       0.0         OS       B       B       B         Approach DS       B       B       B         Dueue Length 50th (m)       1349       535       1705         Dueue Length 95th (m)       1349       535       1705         Starvation Cap Reductn       0       0       0         Starvation Cap Reductn	Fotal Split (s)					38.0	38.0	32.0	32.0				
NII-Red Time (s)       2.5       2.5       2.5       2.5         cost Time Adjust (s)       0.0       0.0       0.0         Total Lost Time (s)       5.8       5.8       5.8         ead/Lag       Lag       Lag         e.ead/Lag Optimize?       Recall Mode       C-Max       C-Max       Max         Ket Effet Green (s)       32.2       2.6.2       C.4.2       Actuated g/C Ratio       0.43       0.35         // Ratio       0.50       0.53       0.45       Control Delay       14.3       16.6       18.0         Queue Delay       0.0       0.0       0.0       0.0       0.0       0.0       0.0         Cost Delay       15.0       18.0       B       B       Description of the temp of tem						50.7%	50.7%	42.7%	42.7%				
ost Time Adjust (s)         0.0         0.0         0.0           fold Lost Time (s)         5.8         5.8         5.8           ead/Lag         Lag         Lag         Lag           ead-Lag Optimize?         Recall Mode         C-Max         C-Max         Max           Ket Effic Green (s)         32.2         32.2         26.2           Actuated g/C Ratio         0.43         0.43         0.35           /c Ratio         0.50         0.53         0.45           Control Delay         14.3         16.6         18.0           Jueue Delay         0.0         0.0         0.0           Jouen Delay         14.3         16.6         18.0           Jueue Delay         14.3         16.6         18.0           Jueue Delay         15.0         18.0         18.0           Sporach Delay         15.0         18.0         18.0           Useue Length S0th (m)         29.8         25.0         27.1           Dueue Length S0th (m)         157.8         130.6         43.8         56.6           Tum Bay Length (m)         1349         535         1705         148.0           Starvation Cap Reductn         0         0         <	(ellow Time (s)					3.3	3.3	3.3	3.3				
Total Lost Time (s)       5.8       5.8       5.8         cead/Lag       Lag       Lag         eead/Lag Optimize?       Recal Mode       C-Max       C-Max       Max         Vet Effct Green (s)       32.2       32.2       26.2         Vet teffct Green (s)       0.43       0.43       0.35         Vet teffct Green (s)       0.50       0.53       0.45         Control Delay       14.3       16.6       18.0         Dueue Delay       0.0       0.0       0.0         Total Delay       14.3       16.6       18.0         OS       B       B       B         Sueue Delay       15.0       18.0       18.0         OS       B       B       B       B         Dueue Length 50th (m)       29.8       25.0       27.1       22.0         Lueue Length 95th (m)       m41.1       m37.1       37.2       11.0         Rase Capacity (vph)       1349       535       1705       11.0         Starvation Cap Reductn       0       0       0       0       0         Starvation Cap Reductn       0       0       0       0       0       12.0         Storage Cap	All-Red Time (s)					2.5	2.5	2.5	2.5				
Lag         Lag         Lag           cead-Lag Optimize?	ost Time Adjust (s)					0.0	0.0		0.0				
Lead-Lag Optimize?           Stead Mode         C-Max         C-Max         Max         Max           Vict Effct Green (s)         32:2         32:2         26:2           Victated g/C Ratio         0.43         0.43         0.35           v/c Ratio         0.50         0.53         0.45           Control Delay         14:3         16:6         18.0           Dueue Delay         0.0         0.0         0.0           Otal Delay         14:3         16:6         18.0           OS         B         B         B           OS         B         B         B           Jourot Delay         15.0         18.0         18.0           OS         B         B         B         D           Jourot Delay         15.0         18.0         18.0         18.0           Jourot LOS         B         B         B         D         20         27.1         20           Jueue Length 50th (m)         157.8         130.6         43.8         56.6         10m         32.5         1705         32         32.5         1705         32         32.5         1705         32         32.6         32.6         32.6 <td>fotal Lost Time (s)</td> <td></td> <td></td> <td></td> <td></td> <td>5.8</td> <td>5.8</td> <td></td> <td>5.8</td> <td></td> <td></td> <td></td> <td></td>	fotal Lost Time (s)					5.8	5.8		5.8				
Recall Mode         C-Max         C-Max         Max         Max           Act Effect Green (s)         32.2         32.2         26.2           Actuated g/C Ratio         0.43         0.43         0.35           // c Ratio         0.50         0.53         0.445           Control Delay         14.3         16.6         18.0           Dueue Delay         0.0         0.0         0.0           Otal Delay         14.3         16.6         18.0           Dueue Delay         14.3         16.6         18.0           OS         B         B         B           Approach Delay         15.0         18.0         18.0           Deueu Length 50th (m)         29.8         25.0         27.1           Dueue Length 95th (m)         m41.1         m37.1         37.2           Chem Bay Length (m)         1349         535         1705           Starvation Cap Reductn         0         0         0           Starvation Cap Reductn	_ead/Lag					Lag	Lag						
Act Effct Green (s)       32.2       32.2       26.2         Actuated g/C Ratio       0.43       0.43       0.35         v/c Ratio       0.50       0.53       0.45         Ontrol Delay       14.3       16.6       18.0         Dueue Delay       0.0       0.0       0.0         OS       B       B       B         Approach Delay       15.0       18.0         Approach Delay       15.0       18.0         Approach DS       B       B         Queue Length 50th (m)       29.8       25.0       27.1         Queue Length 95th (m)       m41.1       m37.1       37.2         Internal Link Dist (m)       157.8       130.6       43.8       56.6         Cur Bay Length (m)       1349       535       1705         Starvation Cap Reductn       0       0       0         Storage Cap Reductn       0       0       0         Storage Cap Reductn       0       0       0         V	ead-Lag Optimize?					Ŭ	Ū						
Actuated g/C Ratio         0.43         0.43         0.35           //c Ratio         0.50         0.53         0.45           Control Delay         14.3         16.6         18.0           Queue Delay         0.0         0.0         0.0           Total Delay         14.3         16.6         18.0           Queue Delay         15.0         18.0           Approach LOS         B         B         B           Approach LOS         B         B         B           Queue Length 50th (m)         29.8         25.0         27.1           Queue Length 95th (m)         m41.1         m37.1         37.2           Internal Link Dist (m)         157.8         130.6         43.8         56.6           Turm Bay Length (m)         535         1705         5         1349         535         1705           Starvation Cap Reductn         0	Recall Mode					C-Max	C-Max	Max	Max				
v/c Ratio       0.50       0.53       0.45         2ontrol Delay       14.3       16.6       18.0         Daueue Delay       0.0       0.0       0.0         Orlai Delay       14.3       16.6       18.0         OS       B       B       B         Approach Delay       15.0       18.0         Approach Delay       15.0       29.8         Queue Length 50th (m)       29.8       25.0       27.1         Queue Length 95th (m)       m41.1       m37.1       37.2         Internal Link Dist (m)       157.8       130.6       43.8       56.6         Furm Bay Length (m)       1349       535       1705         Starvation Cap Reductn       0       0       0         Starvation Cap Reductn       0       0       0         Storage Cap Reductn       0       0       0         Reduced v/c Ratio       0.50       0.53       0.45         Intersection Summary       55       1705       5	Act Effct Green (s)					32.2	32.2		26.2				
Control Delay         14.3         16.6         18.0           Queue Delay         0.0         0.0         0.0           Total Delay         14.3         16.6         18.0           OS         0.0         14.3         16.6         18.0           Approach Delay         16.6         18.0         18.0           Approach Delay         15.0         18.0         18.0           Approach DS         B         B         B         Delay           Queue Length S0th (m)         29.8         25.0         27.1         20.0           Jueue Length 95th (m)         m41.1         m37.1         37.2         0.0	Actuated g/C Ratio					0.43	0.43		0.35				
Dueue Delay         0.0         0.0         0.0           Total Delay         14.3         16.6         18.0           .OS         B         B         B           Approach Delay         15.0         18.0           Approach LOS         B         B         B           Dueue Length 50th (m)         29.8         25.0         27.1           Dueue Length 50th (m)         m41.1         m37.1         37.2           Internal Link Dist (m)         157.8         130.6         43.8         56.6           Turn Bay Length (m)         343         535         1705           Starvation Cap Reductn         0         0         0           Spilback Cap Reductn         0         0         0           Storage Cap Reductn         0         0         0           Storage Cap Reductn         0.50         0.53         0.45           Intersection Summary         Sycle Length: 75         Sycle Length: 75         Sycle Length: 75	//c Ratio					0.50	0.53		0.45				
Total Delay         14.3         16.6         18.0           .OS         B         B         B           Approach Delay         15.0         18.0           Approach Delay         15.0         18.0           Approach Delay         15.0         18.0           Approach Delay         15.0         18.0           Approach LOS         B         B           Dueue Length 50th (m)         29.8         25.0         27.1           Dueue Length 95th (m)         m41.1         m37.1         37.2           Internal Link Dist (m)         157.8         130.6         43.8         56.6           Turm Bay Length (m)         1349         535         1705         3424           Starvation Cap Reductn         0         0         0         0         30         3018         3018         56.6         11349         535         1705         3424         3424         3535         1705         312474         3149         353         1705         312474         3149         30         30         3149         3124         3149         3149         3149         3149         3149         3149         3149         3149         3149         3149         3149 <td>Control Delay</td> <td></td> <td></td> <td></td> <td></td> <td>14.3</td> <td>16.6</td> <td></td> <td>18.0</td> <td></td> <td></td> <td></td> <td></td>	Control Delay					14.3	16.6		18.0				
OS         B         B         B           Approach Delay         15.0         18.0           Approach Delay         15.0         18.0           Approach LOS         B         B           Dueue Length S0th (m)         29.8         25.0         27.1           Dueue Length 95th (m)         m41.1         m37.1         37.2           nternal Link Dist (m)         157.8         130.6         43.8         56.6           Furm Bay Length (m)         349         535         1705           Starvation Cap Reductn         0         0         0           Spillback Cap Reductn         0         0         0           Storage Cap Reductn         0         0         0           Reduced v/c Ratio         0.50         0.53         0.45           ntersection Summary         Dycle Length: 75         U         U	Queue Delay					0.0	0.0		0.0				
Approach Delay         15.0         18.0           Approach LOS         B         B           Dueue Length 50th (m)         29.8         25.0         27.1           Jueue Length 95th (m)         m41.1         m37.1         37.2           Internal Link Dist (m)         157.8         130.6         43.8         56.6           Turn Bay Length (m)         3ase Capacity (vph)         1349         535         1705           Starvation Cap Reductn         0         0         0         0           SpliBack Cap Reductn         0         0         0         0           Storage Cap Reductn         0         0         0.45         0           Storage Cap Reductn         0         0         0.53	Total Delay					14.3	16.6		18.0				
B         B           Dueue Length 50th (m)         29.8         25.0         27.1           Dueue Length 50th (m)         m41.1         m37.1         37.2           Internal Link Dist (m)         157.8         130.6         43.8         56.6           Tim Bay Length (m)         3388         535         1705           Starvation Cap Reductn         0         0         0           Spillback Cap Reductn         0         0         0           O         0         0         0         0           Reduced v/c Ratio         0.50         0.53         0.45           Intersection Summary         2020 Length: 75         1000 Length: 75         1000 Length: 75	.0S					В	В		В				
Dueue Length 50th (m)         29.8         25.0         27.1           Dueue Length 95th (m)         m41.1         m37.1         37.2           nternal Link Dist (m)         157.8         130.6         43.8         56.6           Tum Bay Length (m)         1349         535         1705           Starvation Cap Reductn         0         0         0           Spillback Cap Reductn         0         0         0           Storage Cap Reductn         0         0         0           Reduced v/c Ratio         0.50         0.53         0.45           ntersection Summary         Dycle Length: 75         Total         Total	Approach Delay					15.0			18.0				
Dueue Length 50th (m)         29.8         25.0         27.1           Dueue Length 95th (m)         m41.1         m37.1         37.2           nternal Link Dist (m)         157.8         130.6         43.8         56.6           Tum Bay Length (m)         1349         535         1705           Starvation Cap Reductn         0         0         0           Spillback Cap Reductn         0         0         0           Storage Cap Reductn         0         0         0           Reduced v/c Ratio         0.50         0.53         0.45           ntersection Summary         Dycle Length: 75         Total         Total	Approach LOS					В			В				
Itemal Link Dist (m)         157.8         130.6         43.8         56.6           fum Bay Length (m)         3ase Capacity (vph)         1349         535         1705           sase Capacity (vph)         1349         535         1705           Starvation Cap Reductn         0         0         0           pillback Cap Reductn         0         0         0           seduced vic Ratio         0.50         0.53         0.45						29.8	25.0		27.1				
Furn Bay Length (m)           Jase Capacity (vph)         1349         535         1705           Starvation Cap Reductn         0         0         0           Spillback Cap Reductn         0         0         0           Spillback Cap Reductn         0         0         0           Reduced v/c Ratio         0.50         0.53         0.45           Intersection Summary         Cycle Length: 75         75	Queue Length 95th (m)					m41.1	m37.1		37.2				
Base Capacity (vph)         1349         535         1705           Starvation Cap Reductn         0         0         0           Spillback Cap Reductn         0         0         0           Spillback Cap Reductn         0         0         0           Reduced v/c Ratio         0.50         0.53         0.45           Intersection Summary         2         2         2	nternal Link Dist (m)		157.8			130.6			43.8			56.6	
Starvation Cap Reductn         0         0         0           Spillback Cap Reductn         0         0         0           Storage Cap Reductn         0         0         0           Seduced vic Ratio         0.50         0.53         0.45           Intersection Summary         2         2         2	Furn Bay Length (m)												
Spillback Cap Reductn         0         0         0           Storage Cap Reductn         0         0         0           Reduced v/c Ratio         0.50         0.53         0.45           Intersection Summary         2         2         2           Cycle Length: 75         75         2         2						1349	535		1705				
Oplitiback Cap Reductn         O         O         O           Storage Cap Reductn         O						0	0		0				
Reduced v/c Ratio         0.50         0.53         0.45           Intersection Summary						0	0		0				
Reduced v/c Ratio         0.50         0.53         0.45           Intersection Summary         Dycle Length: 75         Dyce Length: 75         Dyce Length: 75	Storage Cap Reductn					0	0		0				
Cycle Length: 75						0.50	0.53		0.45				
	ntersection Summary												
atuated Quale Lengths 75													
Cutated Cycle Lengin. 75 Diffset: 12 (16%), Referenced to phase 2: and 6:WBT, Start of Green	Actuated Cycle Length: 75												

Synchro 10 Light Report Page 3

Lanes, Volumes, Timings	2024 Future Background
2: Kent & Catherine	05-16-2024

Lane Group	Ø5			
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Satd. Flow (prot)				
Flt Permitted				
Satd. Flow (perm)				
Satd. Flow (RTOR)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	5			
Permitted Phases				
Detector Phase				
Switch Phase				
Minimum Initial (s)	1.0			
Minimum Split (s)	5.0			
Total Split (s)	5.0			
Total Split (%)	7%			
Yellow Time (s)	2.0			
All-Red Time (s)	0.0			
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lead			
Lead-Lag Optimize?				
Recall Mode	Max			
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
Queue Length 50th (m)				
Queue Length 95th (m)				
Internal Link Dist (m)				
Turn Bay Length (m)				
Base Capacity (vph)				
Starvation Cap Reductn				
Spillback Cap Reductn				
Storage Cap Reductn				
Reduced v/c Ratio				

30-48 Chamberlain PM PEAK HOUR

Lanes, Volumes, Timings 2: Kent & Catherine	
Maximum v/c Ratio: 0.53	

Intersection Signal Delay: 16.3	Intersection LOS: B											
Intersection Capacity Utilization 50.5%	ICU Level of Service A											
Analysis Period (min) 15												
m Volume for 95th percentile queue is metered by	m Volume for 95th percentile queue is metered by upstream signal.											
Splits and Phases: 2: Kent & Catherine												

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Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø4	
Lane Configurations		<u></u>						
Traffic Volume (vph)	0	772	0	0	0	0		
Future Volume (vph)	0	772	0	0	0	0		
Satd. Flow (prot) Flt Permitted	0	3316	0	0	0	0		
Satd. Flow (perm)	0	3316	0	0	0	0		
Satd. Flow (RTOR)								
Lane Group Flow (vph)	0	772	0	0	0	0		
Turn Type		NA						
Protected Phases		2					4	
Permitted Phases								
Detector Phase		2						
Switch Phase								
Minimum Initial (s)		10.0					10.0	
Minimum Split (s)		36.0					21.0	
Total Split (s)		36.0					21.0	
Total Split (%)		63.2%					37%	
Yellow Time (s)		3.3					3.0	
All-Red Time (s)		1.7					1.0	
Lost Time Adjust (s)		0.0					1.0	
Total Lost Time (s)		5.0						
Lead/Lag		5.0						
Lead-Lag Optimize?								
Recall Mode		Min					None	
Act Effct Green (s)		34.6					NOTIC	
Actuated g/C Ratio		0.83						
v/c Ratio		0.03						
Control Delay		4.3						
Queue Delay		4.3						
Total Delay		4.3						
LOS		4.5 A						
		4.3						
Approach Delay								
Approach LOS		A						
Queue Length 50th (m)		0.0						
Queue Length 95th (m)		32.2	470 (		00.7			
Internal Link Dist (m)		270.2	176.4		23.7			
Turn Bay Length (m)		0700						
Base Capacity (vph)		2738						
Starvation Cap Reductn		0						
Spillback Cap Reductn		0						
Storage Cap Reductn		0						
Reduced v/c Ratio		0.28						
Intersection Summary								
Cycle Length: 57								
Actuated Cycle Length: 41.9								
Natural Cycle: 60								
Control Type: Semi Act-Uncod	rd							
Maximum v/c Ratio: 0.28								

Synchro 10 Light Report Page 5

2024 Future Background 05-16-2024

Lanes, Volumes, Timings 3: Chamberlain & Kent	2024 Future Backgroun 05-16-202
Intersection Signal Delay: 4.3	Intersection LOS: A
Intersection Capacity Utilization 26.7%	ICU Level of Service A
Analysis Period (min) 15	
Splits and Phases: 3: Chamberlain & Kent	
<b>→</b> ø2	* <b>k</b> 04
36 c	21 c

	≯	-	$\mathbf{i}$	4	+		•	1	1	1	+	4
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBF
Lane Configurations					ፈቶኩ			41>			<b>≜</b> †}	
Traffic Volume (vph)	0	0	0	257	553	157	199	340	0	0	643	120
Future Volume (vph)	0	0	0	257	553	157	199	340	0	0	643	12
Satd. Flow (prot)	0	0	0	0	4536	0	0	3256	0	0	3077	1
Flt Permitted	-	-	-	-	0.987	-	-	0.544	-	-		
Satd. Flow (perm)	0	0	0	0	4474	0	0	1766	0	0	3077	(
Satd. Flow (RTOR)					51						29	
Lane Group Flow (vph)	0	0	0	0	967	0	0	539	0	0	763	(
Turn Type				Perm	NA		pm+pt	NA			NA	
Protected Phases					8		5	2			6	
Permitted Phases				8			2					
Detector Phase				8	8		5	2			6	
Switch Phase					-						-	
Minimum Initial (s)				10.0	10.0		5.0	10.0			10.0	_
Minimum Split (s)				23.6	23.6		10.4	21.4			21.4	
Total Split (s)				24.0	24.0		14.0	41.0			27.0	
Total Split (%)				32.0%	32.0%		18.7%	54.7%			36.0%	
Yellow Time (s)				3.3	3.3		3.3	3.3			3.3	
All-Red Time (s)				2.3	2.3		2.1	2.1			2.1	
Lost Time Adjust (s)				2.0	0.0		2.1	0.0			0.0	
Total Lost Time (s)					5.6			5.4			5.4	
Lead/Lag				Lag	Lag			0.4			Lag	
Lead-Lag Optimize?				Lug	Lug						Yes	
Recall Mode				Max	Max		Max	C-Max			C-Max	
Act Effct Green (s)				IVICIA	18.4		WIGA	35.6			21.6	
Actuated g/C Ratio					0.25			0.47			0.29	
v/c Ratio					0.85			0.53			0.84	
Control Delay					34.4			12.2			34.5	
Queue Delay					0.0			0.0			2.9	
Total Delay					34.4			12.2			37.4	
LOS					04.4 C			12.2 B			D	
Approach Delay					34.4			12.2			37.4	
Approach LOS					04.4 C			12.2 B			57.4 D	
Queue Length 50th (m)					45.4			14.9			51.2	
Queue Length 95th (m)					#66.1			14.5			#80.1	
Internal Link Dist (m)		130.6			383.3			80.8			138.4	
Turn Bay Length (m)		130.0			303.3			00.0			130.4	
Base Capacity (vph)					1136			1009			906	
Starvation Cap Reductn					0			0			0	
Spillback Cap Reductn					1			0			71	
Storage Cap Reductin					0			0			0	
Reduced v/c Ratio					0.85			0.53			0.91	
					0.00			0.00			0.01	
Intersection Summary Cycle Length: 75		_		_	_							_
Actuated Cycle Length: 75 Offset: 50 (67%), Reference	d to phose	2-NDTL	nd 6.CF	T Clort	f Croor							_
	u to priase	Z.INDIL 8	110 0.5E	n, Start C	Green							
Natural Cycle: 70 Control Type: Actuated-Coor	aller at a d											

Synchro 10 Light Report Page 7

Page 8

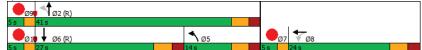
Lanes, Volumes, Timings
4: Bank & Catherine

2024 Future Background 05-16-2024

Lane Configurations Traffic Volume (vph) Future Volume (vph) Satd. Flow (prot) Fit Permitted Satd. Flow (protm) Satd. Flow (perm) Satd. Flow (RTOR) Lane Group Flow (vph) Turn Type Protected Phases Permitted Phases Detector Phase Detector Phase Switch Phase Detector Phase Switch Phase Minimum Initial (s) Minimum Split (s) Total Split (s) Lost Time (s) Lost Time Adjust (s) Total Lost Time (s) Lead/Lag Optimize?			
Traffic Volume (vph) Future Volume (vph) Satd. Flow (port) Fit Permitted Satd. Flow (perm) Satd. Flow (RTOR) Lane Group Flow (vph) Turn Type Protected Phases Detector Phase Detector Phase Detector Phase Switch Phase Minimum Split (s) Total Split (%) Yellow Time (s) All-Red Time (s) Lost Time Adjust (s) Total Lost Time (s) Lost Tim			
Future Volume (vph) Satd. Flow (prot) Fit Permitted Satd. Flow (perm) Satd. Flow (perm) Satd. Flow (PTOR) Lane Group Flow (vph) Tum Type Protected Phases Permitted Phases Permitted Phases Detector Phase Switch Phase Minimum Initial (s) Minimum Split (s) Total Split (s) Total Split (s) Total Split (s) Total Split (s) All-Red Time (s) All-Red Time (s) Lost Time Adjust (s) Total Lost Time (s)			
Satd. Flow (prot) FIP Permitted Satd. Flow (perm) Satd. Flow (RTOR) Lane Group Flow (vph) Turn Type Protected Phases Permitted Phases Detector Phase Switch Phase Minimum Initial (s) Minimum Split (s) Total Split (s) Total Split (s) Total Split (s) All-Red Time (s) All-Red Time (s) Lost Time Adjust (s) Total Lost Time (s) Lost Time (s)			
Fit Permitted Satd. Flow (perm) Satd. Flow (RTOR) Lane Group Flow (vph) Tum Type Protected Phases Permitted Phases Detector Phase Switch Phase Minimum Initial (s) Minimum Split (s) Total Split (s) Total Split (s) Total Split (s) All-Red Time (s) All-Red Time (s) Lost Time Adjust (s) Total Lost Time (s) Lost Time (s)			
Satd. Flow (perm) Satd. Flow (RTOR) Lane Group Flow (vph) Tum Type Protected Phases Detector Phase Switch Phase Winimum Initial (s) Minimum Split (s) Total Split (s) Total Split (s) Total Split (s) Yellow Time (s) All-Red Time (s) Lost Time Adjust (s) Total Lost Time (s) Lost Time (s)			
Satd. Flow (RTOR) Lane Group Flow (vph) Turn Type Protected Phases Permitted Phases Detector Phase Switch Phase Minimum Initial (s) Minimum Split (s) Total Split (s) Total Split (s) Total Split (s) Yellow Time (s) All-Red Time (s) Lost Time Adjust (s) Total Lost Time (s) Lost Time (s)			
Lane Group Flow (vph) Turn Type Protected Phases Permitted Phases Detector Phase Switch Phase Minimum Initial (s) Minimum Split (s) Total Split (s) Total Split (s) Total Split (s) Yellow Time (s) All-Red Time (s) Lost Time Adjust (s) Total Lost Time (s) Lead/Lag			
Turn Type Protected Phases Permitted Phases Detector Phase Switch Phase Minimum Split (s) Total Split (s) Total Split (s) Total Split (%) Yellow Time (s) All-Red Time (s) Lost Time Adjust (s) Total Lost Time (s) Lead/Lag			
Protected Phases Permitted Phases Detector Phase Switch Phase Minimum Split (s) Total Split (s) Total Split (%) Yellow Time (s) All-Red Time (s) Lost Time Adjust (s) Total Lost Time (s) Lead/Lag			
Permitted Phases Detector Phase Switch Phase Minimum Initial (s) Total Split (s) Total Split (s) Total Split (%) Yellow Time (s) All-Red Time (s) Lost Time Adjust (s) Total Lost Time (s) Lead/Lag	7	0	13
Detector Phase Switch Phase Minimum Initial (s) Minimum Split (s) Total Split (%) Yellow Time (s) All-Red Time (s) Lost Time Adjust (s) Total Lost Time (s) Lead/Lag	7	9	13
Switch Phase Minimum Initial (s) Minimum Split (s) Total Split (s) Total Split (%) Yellow Time (s) All-Red Time (s) Lost Time Adjust (s) Total Lost Time (s) Lead/Lag			
Minimum Initial (s) Minimum Split (s) Total Split (s) Total Split (%) Yellow Time (s) All-Red Time (s) Lost Time Adjust (s) Total Lost Time (s) Lead/Lag			
Minimum Split (s) Total Split (s) Total Split (%) Yellow Time (s) All-Red Time (s) Lost Time Adjust (s) Total Lost Time (s) Lead/Lag			
Total Split (s) Total Split (%) Yellow Time (s) All-Red Time (s) Lost Time Adjust (s) Total Lost Time (s) Lead/Lag	1.0	1.0	1.0
Total Split (%) Yellow Time (s) All-Red Time (s) Lost Time Adjust (s) Total Lost Time (s) Lead/Lag	5.0	5.0	5.0
Yellow Time (s) All-Red Time (s) Lost Time Adjust (s) Total Lost Time (s) Lead/Lag	5.0	5.0	5.0
All-Red Time (s) Lost Time Adjust (s) Total Lost Time (s) Lead/Lag	7%	7%	7%
Lost Time Adjust (s) Total Lost Time (s) Lead/Lag	2.0	2.0	2.0
Lost Time Adjust (s) Total Lost Time (s) Lead/Lag	0.0	0.0	0.0
Total Lost Time (s) Lead/Lag			
Lead/Lag			
	Lead		Lead
Lead-Lad Optimize?	2000		Yes
Recall Mode	Max	Max	Max
Act Effct Green (s)	WIGA	ITTUA	Max
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (m)			
Queue Length 95th (m)			
Internal Link Dist (m)			
Turn Bay Length (m)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			
Intersection Summary			

Lanes, Volumes, Timings	2024 Future Background	
4: Bank & Catherine	05-16-2024	
Maximum v/c Ratio: 0.85		
Intersection Signal Delay: 30.1	Intersection LOS: C	
Intersection Capacity Utilization 76.8%	ICU Level of Service D	
Analysis Period (min) 15		
# 95th percentile volume exceeds capacity, queue	e may be longer.	
Queue shown is maximum after two cycles.		

Splits and Phases: 4: Bank & Catherine



30-48 Chamberlain PM PEAK HOUR

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30-48 Chamberlain PM PEAK HOUR

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_ane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SB
ane Configurations		t},	1					A1⊅			- <b>↑</b> }-	
Traffic Volume (vph)	53	590	120	0	0	0	0	476	91	175	720	
Future Volume (vph)	53	590	120	0	0	0	0	476	91	175	720	
Satd. Flow (prot)	0	3302	1483	0	0	0	0	3106	0	0	3283	
Flt Permitted		0.996									0.715	
Satd. Flow (perm)	0	3299	1345	0	0	0	0	3106	0	0	2326	
Satd. Flow (RTOR)			134					31				
ane Group Flow (vph)	0	643	120	0	0	0	0	567	0	0	895	
Turn Type	Perm	NA	Perm					NA		pm+pt	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4							6		
Detector Phase	4	4	4					2		1	6	
Switch Phase												
Vinimum Initial (s)	10.0	10.0	10.0					10.0		5.0	10.0	
Vinimum Split (s)	26.2	26.2	26.2					23.1		11.1	23.1	
Total Split (s)	31.0	31.0	31.0					30.0		14.0	44.0	
Total Split (%)	41.3%	41.3%	41.3%					40.0%		18.7%	58.7%	
Yellow Time (s)	3.3	3.3	3.3					3.0		3.0	3.0	
All-Red Time (s)	2.9	2.9	2.9					3.1		3.1	3.1	
Lost Time Adjust (s)		0.0	0.0					0.0			0.0	
Total Lost Time (s)		6.2	6.2					6.1			6.1	
_ead/Lag								Lead		Lag		
_ead-Lag Optimize?								Yes		Yes		
Recall Mode	None	None	None					C-Max		None	C-Max	
Act Effct Green (s)		20.5	20.5					42.2			42.2	
Actuated g/C Ratio		0.27	0.27					0.56			0.56	
//c Ratio		0.71	0.26					0.32			0.68	
Control Delay		29.0	4.7					9.4			13.2	
Queue Delay		0.0	0.0					0.0			3.0	
Total Delay		29.0	4.7					9.4			16.2	
LOS		С	A					A			В	
Approach Delay		25.2						9.4			16.2	
Approach LOS		С						A			В	
Queue Length 50th (m)		43.2	0.0					19.2			71.1	
Queue Length 95th (m)		55.3	8.7					32.7			m88.0	
nternal Link Dist (m)		176.4			219.4			129.7			80.8	
Turn Bay Length (m)			30.0									
Base Capacity (vph)		1090	534					1761			1308	
Starvation Cap Reductn		0	0					0			300	
Spillback Cap Reductn		0	0					0			0	
Storage Cap Reductn		0	0					0			0	
Reduced v/c Ratio		0.59	0.22					0.32			0.89	
ntersection Summary												
Cycle Length: 75												
Actuated Cycle Length: 75												
Offset: 60 (80%), Reference	ed to phase	2:NBT a	nd 6:SBTI	L. Start of	Green							

Synchro 10 Light Report Page 11 Lanes, Volumes, Timings 5: Bank & Chamberlain/Isabella 2024 Future Background 05-16-2024

Maximum v/c Ratio: 0.71		
Intersection Signal Delay: 17.6	Intersection LOS: B	
Intersection Capacity Utilization 82.0%	ICU Level of Service E	
Analysis Period (min) 15		

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

Splits and Phases: 5: Bank & Chamberlain/Isabella

Ø2 (R)		Ø1	<i>↓</i> 04				
30 s		14 s	31s				
Ø6 (R)							
44 s							

30-48 Chamberlain PM PEAK HOUR

# Appendix G

Synchro Intersection Worksheets – 2029 Future Background Conditions



1: HWY 417 OR/Ly			-									
	≯	→	$\rightarrow$	- 🖌	+	•	1	- Ť.	1	1	Ŧ	-
ane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBF
ane Configurations					441>						•	1
Traffic Volume (vph)	0	0	0	222	219	0	0	0	0	0	258	130
Future Volume (vph)	0	0	0	222	219	0	0	0	0	0	258	13(
Satd. Flow (prot)	0	0	0	0	4645	0	0	0	0	0	1745	148
Flt Permitted					0.975							
Satd. Flow (perm)	0	0	0	0	4612	0	0	0	0	0	1745	1454
Satd. Flow (RTOR)					222							13
ane Group Flow (vph)	0	0	0	0	441	0	0	0	0	0	258	13
Turn Type				Perm	NA					-	NA	Perr
Protected Phases					6						4	
Permitted Phases				6	-							
Detector Phase				6	6						4	
Switch Phase				· ·	v							
Minimum Initial (s)				10.0	10.0						10.0	10.
Vinimum Split (s)				26.2	26.2						28.3	28.
Total Split (s)				40.0	40.0						35.0	35.0
Total Split (%)				53.3%	53.3%						46.7%	46.7%
Yellow Time (s)				3.3	3.3						3.3	40.77
All-Red Time (s)				3.3 1.9	1.9						2.0	2.
				1.9	0.0						2.0	2.
Lost Time Adjust (s)					5.2							
Total Lost Time (s)					5.2						5.3	5.3
_ead/Lag												
_ead-Lag Optimize?				0.14	0.14							
Recall Mode				C-Max	C-Max						Max	Ma
Act Effct Green (s)					34.8						29.7	29.
Actuated g/C Ratio					0.46						0.40	0.4
//c Ratio					0.20						0.37	0.20
Control Delay					10.5						18.1	3.
Queue Delay					0.0						0.0	0.
Total Delay					10.5						18.1	3.9
LOS					В						В	/
Approach Delay					10.5						13.3	
Approach LOS					В						В	
Queue Length 50th (m)					17.2						25.1	0.
Queue Length 95th (m)					26.1						42.7	9.3
nternal Link Dist (m)		117.8			157.8			120.4			277.6	
Turn Bay Length (m)												
Base Capacity (vph)					2258						691	65
Starvation Cap Reductn					0						0	
Spillback Cap Reductn					0						0	
Storage Cap Reductn					0						0	
Reduced v/c Ratio					0.20						0.37	0.2
ntersection Summary												
Cycle Length: 75												
Actuated Cycle Length: 75												
Offset: 48 (64%), Reference	d to phase	2: and 6:	WBTL, S	Start of Gr	een							
Vatural Cycle: 55												

Synchro 10 Light Report Page 1 Lanes, Volumes, Timings 1: HWY 417 OR/Lyon & Catherine 2029 Future Background 05-16-2024

 Maximum v/c Ratio: 0.37
 Intersection LOS: B

 Intersection Capacity Utilization 47.6%
 ICU Level of Service A

 Analysis Period (min) 15
 ICU Level of Service A

Splits and Phases: 1: HWY 417 OR/Lyon & Catherine



30-48 Chamberlain AM Peak Hour

	≯	-	$\mathbf{i}$	1	-		-	1	1	1	÷.	~
_ane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBF
ane Configurations					<b>≜</b> †}	1		4412				
raffic Volume (vph)	0	0	0	0	389	537	54	1408	0	0	0	1
uture Volume (vph)	0	0	0	0	389	537	54	1408	0	0	0	1
Satd. Flow (prot)	0	0	0	0	2916	1350	0	4755	0	0	0	
Flt Permitted								0.998				
Satd. Flow (perm)	0	0	0	0	2916	1262	0	4750	0	0	0	1
Satd. Flow (RTOR)								70				
ane Group Flow (vph)	0	0	0	0	636	290	0	1462	0	0	0	
Furn Type		-	-	-	NA	Perm	Perm	NA	-	-	-	
Protected Phases					6			8				
Permitted Phases						6	8					
Detector Phase					6	6	8	8				
Switch Phase					Ŭ	U	U	Ŭ				
Vinimum Initial (s)					10.0	10.0	10.0	10.0				
Vinimum Split (s)					27.8	27.8	17.8	17.8				
Total Split (s)					32.0	32.0	38.0	38.0				
					42.7%	42.7%	50.7%	50.7%				
Total Split (%) Yellow Time (s)					42.7 %	42.7 %	3.3	3.3				
All-Red Time (s)					2.5	2.5 0.0	2.5	2.5 0.0				
Lost Time Adjust (s)					0.0							
Total Lost Time (s)					5.8	5.8		5.8				
_ead/Lag					Lag	Lag						
_ead-Lag Optimize?												
Recall Mode					C-Max	C-Max	Max	Max				
Act Effct Green (s)					26.2	26.2		32.2				
Actuated g/C Ratio					0.35	0.35		0.43				
//c Ratio					0.62	0.66		0.70				
Control Delay					26.2	30.0		18.8				
Queue Delay					0.0	0.0		0.0				
Total Delay					26.2	30.0		18.8				
LOS					С	С		В				
Approach Delay					27.4			18.8				
Approach LOS					С			В				
Queue Length 50th (m)					42.9	39.6		56.7				
Queue Length 95th (m)					m60.3	m56.8		72.3				
nternal Link Dist (m)		157.8			130.6			47.0			56.6	
Turn Bay Length (m)												
Base Capacity (vph)					1018	440		2079				
Starvation Cap Reductn					0	0		0				
Spillback Cap Reductn					0	0		0				
Storage Cap Reductn					0	0		0				
Reduced v/c Ratio					0.62	0.66		0.70				
ntersection Summary												
Cycle Length: 75												_
Actuated Cycle Length: 75												
Offset: 15 (20%), Referenced	to phone	2. and Gi	NDT CH	ant of Care								

Synchro 10 Light Report Page 3

Lanes, Volumes, Timings	2029 Future Background
2: Kent & Catherine	05-16-2024

Lane Group	Ø5		
Lane Configurations			 
Traffic Volume (vph)			
Future Volume (vph)			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Satd. Flow (RTOR)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	5		
Permitted Phases			
Detector Phase			
Switch Phase			
Minimum Initial (s)	1.0		
Minimum Split (s)	5.0		
Total Split (s)	5.0		
Total Split (%)	7%		
Yellow Time (s)	2.0		
All-Red Time (s)	0.0		
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lead		
Lead-Lag Optimize?			
Recall Mode	Max		
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (m)			
Queue Length 95th (m)			
Internal Link Dist (m)			
Turn Bay Length (m)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

30-48 Chamberlain AM Peak Hour

Lanes, Volumes, Timings 2: Kent & Catherine		2029 Future Background 05-16-2024
Maximum v/c Ratio: 0.70		
Intersection Signal Delay: 22.1	Intersection LOS: C	

Intersection Capacity Utilization 66.3%	ICU Level of Service C	
Analysis Period (min) 15		
m Volume for 95th percentile queue is metered by	y upstream signal.	
Splits and Phases: 2: Kent & Catherine		

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3: Chamberlain & Ker	≯		-		1	1		
	/	-	-	~	>	*		
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø4	
Lane Configurations		- <b>†</b> †						
Traffic Volume (vph)	0	803	0	0	0	0		
Future Volume (vph)	0	803	0	0	0	0		
Satd. Flow (prot)	0	3316	0	0	0	0		
Flt Permitted								
Satd. Flow (perm)	0	3316	0	0	0	0		
Satd. Flow (RTOR)								
Lane Group Flow (vph)	0	803	0	0	0	0		
Turn Type		NA						
Protected Phases		2					4	
Permitted Phases								
Detector Phase		2						
Switch Phase								
Minimum Initial (s)		10.0					10.0	
Minimum Split (s)		36.0					21.0	
Total Split (s)		36.0					21.0	
Total Split (%)		63.2%					37%	
Yellow Time (s)		3.3					3.0	
All-Red Time (s)		1.7					1.0	
Lost Time Adjust (s)		0.0						
Total Lost Time (s)		5.0						
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode		Min					None	
Act Effct Green (s)		33.7						
Actuated g/C Ratio		0.64						
v/c Ratio		0.38						
Control Delay		7.5						
Queue Delay		0.0						
Total Delay		7.5						
LOS		А						
Approach Delay		7.5						
Approach LOS		А						
Queue Length 50th (m)		23.5						
Queue Length 95th (m)		33.7						
Internal Link Dist (m)		270.2	176.4		31.3			
Turn Bay Length (m)								
Base Capacity (vph)		2155						
Starvation Cap Reductn		0						
Spillback Cap Reductn		0						
Storage Cap Reductn		0						
Reduced v/c Ratio		0.37						
Intersection Summary								
Cycle Length: 57								
Actuated Cycle Length: 52.5								
Natural Cycle: 60	_							
Control Type: Semi Act-Uncoor	d							
Maximum v/c Ratio: 0.38								

30-48 Chamberlain AM Peak Hour

Ø6 (R)

Synchro 10 Light Report Page 5

Lanes, Volumes, Timings 3: Chamberlain & Kent	2029 Future Backgrou 05-16-2	
Intersection Signal Delay: 7.5	Intersection LOS: A	
Intersection Capacity Utilization 27.6%	ICU Level of Service A	
Analysis Period (min) 15		
Splits and Phases: 3: Chamberlain & Kent		
ø2	<b>Ak</b> <sub>04</sub>	
36.0	21 a	

Lane Group         EBL           Lane Configurations         Traffic Volume (vph)         0           Future Volume (vph)         0         0           Stat. Flow (prot)         0         0           Stat. Flow (prot)         0         0           Satd. Flow (prot)         0         0           Satd. Flow (prot)         0         0           Satd. Flow (prot)         0         0           Lane Group Flow (vph)         0         0           Turn Type         Protected Phases         0           Permitted Phases         0         0           Minimum Initial (s)         Minimum Initial (s)         0           Minimum Split (s)         Total Split (%)         Yellow Time (s)           Lead Lag         Uset Time (s)         0           Lead/Lag         Lead/Lag         Lead/Lag           Lead/Lag (CRatio         V/c Ratio         V/c Ratio           Control Delay         Queue Delay         Total Delay           Queue Delay         Total Delay         LOS           Approach Delay         Cost         Approach Delay	0 0	EBR 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	WBL 1600 1600 0 0 0 0 0 0 0 0 0 0 0 0	WBT 582 582 582 4481 0.991 4429 81 931 NA 8 10.0 23.6 25.0 33.3% 3.3 0.0 5.6 Lag Yes Max	WBR           189           189           0           0           0	NBL 272 272 0 0 0 pm+pt 5 2 5 5 5.0 10.4 15.0 20.0% 3.3 2.1	NBT 4↑ 626 626 3266 0.638 2049 898 NA 2 2 10.0 21.4 40.0 53.3% 3.3 2.1 0.0 5.4	NBR 0 0 0 0	SBL           0         0           0         0           0         0	SBT           ↑↑→           405           405           3022           344           515           NA           6           10.0           21.4           25.0           33.3%           3.3           2.1           0.0           5.4           Lag           Yes	SBI
Traffic Volume (vph)         0           Future Volume (vph)         0           Satd. Flow (prot)         0           Satd. Flow (prot)         0           Satd. Flow (prot)         0           Satd. Flow (prot)         0           Satd. Flow (prm)         0           Satd. Flow (prm)         0           Satd. Flow (prm)         0           Lane Group Flow (vph)         0           Turn Type         Protected Phases           Permitted Phases         Detector Phase           Switch Phase         Switch Phase           Switch Phase         Switch Phase           Switch Phase         Soutcast Split (s)           Total Split (s)         Total Split (s)           Total Split (s)         Sout Time (s)           Lead-Lag Optimize?         Recall Mode           Act Eff Green (s)         Actuated g/C Ratio           Vc Ratio         Control Delay           Queue Delay         Total Delay           Los         S	0 0	0	160 0 Perm 8 8 10.0 23.6 25.0 33.3% 3.3 2.3 Lag Yes	582 582 4481 0.991 4429 81 931 NA 8 70.0 23.6 25.0 33.3% 3.3 2.3 0.0 5.6 Lag Yes Max	189 0 0	272 0 0 pm+pt 5 2 5 5 5.0 10.4 15.0 20.0% 3.3 2.1	626 626 3266 0.638 2049 898 NA 2 2 2 10.0 21.4 40.0 53.3% 3.3 2.1 0.0	0 0	0 0	405 405 3022 3022 44 515 NA 6 6 6 10.0 21.4 25.0 33.3% 2.1 0.0 5.4 Lag	11
Future Volume (vph)         0           Satd. Flow (prot)         0           Flt Permitted         3           Satd. Flow (perm)         0           Satd. Flow (wpot)         0           Satd. Flow (perm)         0           Satd. Flow (wpot)         0           Satd. Flow (wpot)         0           Satd. Flow (wpot)         0           Lame Group Flow (wph)         0           Protected Phases         0           Permitted Phases         0           Detector Phase         0           Winimum Initial (s)         10           Vinimum Split (s)         10           Total Split (s)         10           Total Split (s)         5           Total Lost Time (s)         0           cad-Lag Optimize?         2           Recall Mode         4           Actuated g/C Ratio         2           Control Delay         2           Queue Delay         10           Ostal Delay         0	0 0	0	160 0 Perm 8 8 10.0 23.6 25.0 33.3% 3.3 2.3 Lag Yes	582 4481 0.991 4429 81 931 NA 8 8 10.0 23.6 25.0 33.3% 3.3 2.3 0.0 5.6 Lag Yes Max	189 0 0	272 0 0 pm+pt 5 2 5 5 5.0 10.4 15.0 20.0% 3.3 2.1	626 3266 0.638 2049 898 NA 2 2 2 10.0 21.4 40.0 53.3% 3.3 2.1 0.0	0 0	0 0	405 3022 44 515 NA 6 10.0 21.4 25.0 33.3% 3.3 2.1 0.0 5.4 Lag	11
Satd. Flow (prot)         0           "It Permitted         3           Satd. Flow (perm)         0           Satd. Flow (RTOR)         .           .ane Group Flow (vph)         0           Turn Type         ?           Protected Phases         ?           Permitted Phases         ?           Verther Phase         ?           Winimum Initial (s)         Winimum Split (s)           Total Split (s)         Total Split (%)           Yellow Time (s)         .           .ead Time (s)         .           .ead-Lag Optimize?         ?           Recall Mode         ?           Act Effct Green (s)         ?           Actual Delay         ?           Octrol Delay         ?           Outed Delay         ?	0	0	0 0 Perm 8 8 8 10.0 23.6 25.0 33.3% 3.3 2.3 Lag Yes	4481 0.991 4429 81 NA 8 331 NA 8 7 0.0 23.6 25.0 33.3% 3.3 2.3 0.0 5.6 Lag Yes Max	0 0	0 0 pm+pt 5 2 5 5 5.0 10.4 15.0 20.0% 3.3 2.1	3266 0.638 2049 898 NA 2 2 10.0 21.4 40.0 53.3% 3.3 2.1 0.0	0	0	3022 3022 44 515 NA 6 6 10.0 21.4 25.0 33.3% 3.3 2.1 0.0 5.4 Lag	
Fit Permitted         Gatd. Flow (perm)         0           Satd. Flow (perm)         0         Satd. Flow (perm)         0           Satd. Flow (PTOR)         a.         Group Flow (ph)         0           Furn Type         Protected Phases         Permitted Phases         Permitted Phases           Detector Phase         Switch Phase         Switch Phase         Switch Phase           Switch Phase         Switch Phase         Switch Phase         Switch Phase           Vinimum Split (s)         Fotal Split (s)         Fotal Split (s)         Fotal Split (s)           Fotal Split (s)         Switch Time (s)         Switch Time (s)         Switch Time (s)           JuRed Time (s)         Lead/Lag         Lead/Lag         Lead/Lag           Lead/Lag         Cead-Lag Optimize?         Recall Mode           Act Left Green (s)         Actuated g/C Ratio         /// // // // // // // // // // // // //	0	0	0 Perm 8 8 8 10.0 23.6 25.0 33.3% 3.3 2.3 Lag Yes	0.991 4429 81 931 NA 8 10.0 23.6 25.0 33.3% 3.3 2.3 0.0 5.6 Lag Yes Max	0	0 0 pm+pt 5 2 5 5.0 10.4 15.0 20.0% 3.3 2.1	0.638 2049 898 NA 2 2 10.0 21.4 40.0 53.3% 3.3 2.1 0.0	0	0	3022 44 515 NA 6 6 10.0 21.4 25.0 33.3% 3.3 2.1 0.0 5.4 Lag	
Satd. Flow (perm)         0           Satd. Flow (RTOR)         0           Lane Group Flow (vph)         0           Urm Type         Protected Phases           Permitted Phases         9           Detector Phase         9           Switch Phase         9           Winimum Initial (s)         9           Fotal Split (s)         Fotal Split (s)           Fotal Split (s)         5           Soatt Time Adjust (s)         5           Fotal Lost Time (s)         6           Lead-Lag         6           ead-Lag Optimize?         7           Recall Mode         4           Vatuated g/C Ratio         7           Control Delay         2           Queue Delay         5           Lotal Delay         2			0 Perm 8 8 8 10.0 23.6 25.0 33.3% 3.3 2.3 2.3 Lag Yes	4429 81 931 NA 8 10.0 23.6 25.0 33.3% 3.3 2.3 0.0 5.6 Lag Yes Max		0 pm+pt 5 2 5 5 50 10.4 15.0 20.0% 3.3 2.1	2049 898 NA 2 2 10.0 21.4 40.0 53.3% 3.3 2.1 0.0			44 515 NA 6 10.0 21.4 25.0 33.3% 3.3 2.1 0.0 5.4 Lag	
Satd. Flow (RTOR)           .ane Group Flow (vph)         0           Turm Type         0           Turm Type         0           Durm Type         0           Turm Type         0           Detector Phases         0           Detector Phase         0           Winimum Initial (s)         0           Vinimum Split (s)         Total Split (s)           Total Split (s)         0           Cotal Split (s)         0           Cotal Split (s)         0           Total Split (s)         0           Cotal Split (s)         0           Cotal Split (s)         0           Total Split (s)         0           Cotal Split (s)         0           Total Split (s)         0           Total Lost Time (s)         0           cad-Lag Optimize?         0           Recall Mode         4           Actuated g/C Ratio         0           Control Delay         0           Queue Delay         1           Total Delay         0           Lost Control Delay         0			0 Perm 8 8 8 10.0 23.6 25.0 33.3% 3.3 2.3 2.3 Lag Yes	81 931 NA 8 8 10.0 23.6 25.0 33.3% 3.3 2.3 0.0 5.6 Lag Yes Max		0 pm+pt 5 2 5 5 50 10.4 15.0 20.0% 3.3 2.1	898 NA 2 2 10.0 21.4 40.0 53.3% 3.3 2.1 0.0			44 515 NA 6 10.0 21.4 25.0 33.3% 3.3 2.1 0.0 5.4 Lag	
Lane Group Flow (vph)         0           Tum Type         Protected Phases           Permitted Phases         9           Permitted Phases         9           Switch Phase         9           Minimum Initial (s)         9           Minimum Split (s)         10           Total Split (s)         10           Total Split (%)         Yellow Time (s)           Lead Time (s)         10.5           Lead-Lag Optimize?         Recall Mode           Act Effct Green (s)         4ctuated g/C Ratio           Vc Ratio         Control Delay           Queue Delay         104           Los         Los	0	0	Perm 8 8 10.0 23.6 25.0 33.3% 3.3 2.3 Lag Yes	931 NA 8 10.0 23.6 25.0 33.3% 3.3 2.3 0.0 5.6 Lag Yes Max	0	pm+pt 5 2 5 5 10.4 15.0 20.0% 3.3 2.1	NA 2 2 10.0 21.4 40.0 53.3% 3.3 2.1 0.0	0	0	515 NA 6 10.0 21.4 25.0 33.3% 3.3 2.1 0.0 5.4 Lag	
Turn Type           Turn Type           Protected Phases           Permitted Phase           Detector Phase           Switch Phas		0	Perm 8 8 10.0 23.6 25.0 33.3% 3.3 2.3 Lag Yes	NA 8 10.0 23.6 25.0 33.3% 3.3 2.3 0.0 5.6 Lag Yes Max	0	pm+pt 5 2 5 5 10.4 15.0 20.0% 3.3 2.1	NA 2 2 10.0 21.4 40.0 53.3% 3.3 2.1 0.0	0	0	NA 6 6 10.0 21.4 25.0 33.3% 3.3 2.1 0.0 5.4 Lag	
Protected Phases Permitted Phases Detector Phase Switch Phase Minimum Initial (s) Total Split (s) Total Split (s) Total Split (s) Cost Time Adjust (s) Total Lost Time (s) Lead/Lag Lead/Lag Lead-Lag Optimize? Recall Mode Act Effc Green (s) Actuated g/C Ratio Control Delay Cueue Delay Total Delay LoS			8 8 10.0 23.6 25.0 33.3% 3.3 2.3 Lag Yes	8 10.0 23.6 25.0 33.3% 3.3 2.3 0.0 5.6 Lag Yes Max		5 2 5 5 10.4 15.0 20.0% 3.3 2.1	2 2 10.0 21.4 40.0 53.3% 3.3 2.1 0.0			6 10.0 21.4 25.0 33.3% 3.3 2.1 0.0 5.4 Lag	
Permitted Phases Detector Phase Switch Phase Switch Phase Winimum Split (s) Total Split (s) Total Split (%) Yellow Time (s) Lead-Lag (s) Lead-Lag Optimize? Recall Mode Act Effct Green (s) Actuated g/C Ratio Actuated g/C Ratio Control Delay Dueue Delay Total Delay Los			8 10.0 23.6 25.0 33.3% 3.3 2.3 Lag Yes	8 10.0 23.6 25.0 33.3% 3.3 2.3 0.0 5.6 Lag Yes Max		2 5 5.0 10.4 15.0 20.0% 3.3 2.1	2 10.0 21.4 40.0 53.3% 3.3 2.1 0.0			6 10.0 21.4 25.0 33.3% 3.3 2.1 0.0 5.4 Lag	
Detector Phase           Switch Phase           Switch Phase           Vinimum Split (s)           Total Split (s)           Lost Time (s)           Lead/Lag           Lead/Lag           Lead/Lag           Lead/Lag           Catl Green (s)           Actuated g/C Ratio           //c Ratio           Control Delay           Queue Delay           Total Delay           Lost			8 10.0 23.6 25.0 33.3% 3.3 2.3 Lag Yes	10.0 23.6 25.0 33.3% 3.3 2.3 0.0 5.6 Lag Yes Max		5 5.0 10.4 15.0 20.0% 3.3 2.1	10.0 21.4 40.0 53.3% 3.3 2.1 0.0			10.0 21.4 25.0 33.3% 3.3 2.1 0.0 5.4 Lag	
Switch Phase           Winimum Initial (s)           Winimum Split (s)           Total Split (s)           Total Split (s)           Cost Time (s)           All-Red Time (s)           cost Time Adjust (s)           Total Cost Time (s)           cost Time Adjust (s)           Cost Time Adjust (s)           Catal Loat Time (s)           _ead-Lag Optimize?           Recall Mode           Actuated g/C Ratio           /cr Ratio           Control Delay           Queue Delay           Total Delay           Lost			10.0 23.6 25.0 33.3% 3.3 2.3 Lag Yes	10.0 23.6 25.0 33.3% 3.3 2.3 0.0 5.6 Lag Yes Max		5.0 10.4 15.0 20.0% 3.3 2.1	10.0 21.4 40.0 53.3% 3.3 2.1 0.0			10.0 21.4 25.0 33.3% 3.3 2.1 0.0 5.4 Lag	
Viinimum Initial (s)           Viinimum Split (s)           Total Split (s)           Total Split (%)           Yellow Time (s)           All-Red Time (s)           cost Time Adjust (s)           Total Lost Time (s)           cost Time Adjust (s)           Read-Lag Optimize?           Recall Mode           Actuated g/C Ratio           Zueute Delay           Total Delay           Jotal Delay           Cost			23.6 25.0 33.3% 3.3 2.3 Lag Yes	23.6 25.0 33.3% 3.3 2.3 0.0 5.6 Lag Yes Max		10.4 15.0 20.0% 3.3 2.1	21.4 40.0 53.3% 3.3 2.1 0.0			21.4 25.0 33.3% 3.3 2.1 0.0 5.4 Lag	
Minimum Split (s)           Total Split (s)           Total Split (s)           Total Split (s)           All-Red Time (s)           Lost Time (s)           Lead/Lag           Lead/Lag           Act Effcd Green (s)           Actuated g/C Ratio           v/c Ratio           Control Delay           Queue Delay           Total Lost           Lost Time Joint			23.6 25.0 33.3% 3.3 2.3 Lag Yes	23.6 25.0 33.3% 3.3 2.3 0.0 5.6 Lag Yes Max		10.4 15.0 20.0% 3.3 2.1	21.4 40.0 53.3% 3.3 2.1 0.0			21.4 25.0 33.3% 3.3 2.1 0.0 5.4 Lag	
Total Split (s)           Total Split (%)           Yellow Time (s)           Lost Time (s)           Lost Time (s)           Lead/Lag           Lead/Lag           Lead/Lag           Lead/Lag           Act Effct Green (s)           Actuated g/C Ratio           //c Ratio           Control Delay           Queue Delay           Total Delay           Lost           Lost			25.0 33.3% 3.3 2.3 Lag Yes	25.0 33.3% 3.3 2.3 0.0 5.6 Lag Yes Max		15.0 20.0% 3.3 2.1	40.0 53.3% 3.3 2.1 0.0			25.0 33.3% 3.3 2.1 0.0 5.4 Lag	
Total Split (%)           Yellow Time (s)           All-Red Time (s)           cost Time Adjust (s)           Total Lost Time (s)           Lead/Lag           Lead/Lag Optimize?           Recall Mode           Act Effct Green (s)           Actuated g/C Ratio           Vc Ratio           Control Delay           Queue Delay           Total Delay           LoS			33.3% 3.3 2.3 Lag Yes	33.3% 3.3 2.3 0.0 5.6 Lag Yes Max		20.0% 3.3 2.1	53.3% 3.3 2.1 0.0			33.3% 3.3 2.1 0.0 5.4 Lag	
Yellow Time (s) All-Red Time (s) Lost Time Adjust (s) Total Lost Time (s) Lead-Lag Optimize? Recall Mode Act Effct Green (s) Actuated g/C Ratio Ver Ratio Control Delay Queue Delay Dotal Delay LOS			3.3 2.3 Lag Yes	3.3 2.3 0.0 5.6 Lag Yes Max		3.3 2.1	3.3 2.1 0.0			3.3 2.1 0.0 5.4 Lag	
All-Red Time (s)           Lost Time Adjust (s)           Total Lost Time (s)           Lead/Lag           Lead-Lag Optimize?           Recall Mode           Act Effct Green (s)           Actuated g/C Ratio           v/c Ratio           Control Delay           Queue Delay           Total Delay           LOS			2.3 Lag Yes	2.3 0.0 5.6 Lag Yes Max		2.1	2.1 0.0			2.1 0.0 5.4 Lag	
Lost Time Adjust (s) Total Lost Time (s) Lead/Lag Lead/Lag cead-Lag Optimize? Recall Mode Act Effct Green (s) Actuated g/C Ratio //c Ratio Control Delay Queue Delay Total Delay LOS			Lag Yes	0.0 5.6 Lag Yes Max			0.0			0.0 5.4 Lag	
Total Lost Time (s)           .ead/Lag           .ead/Lag Optimize?           Recall Mode           Act Effct Green (s)           Actuated g/C Ratio           /c Ratio           Control Delay           Queue Delay           Total Delay           .OS			Yes	5.6 Lag Yes Max						5.4 Lag	
Lead/Lag Lead-Lag Optimize? Recall Mode Act Effct Green (s) Actuated g/C Ratio //c Ratio 2ontrol Delay Dueue Delay Total Delay LOS			Yes	Lag Yes Max			5.4			Lag	
Lead-Lag Optimize? Recall Mode Act Effct Green (s) Actuated g/C Ratio v/c Ratio Control Delay Queue Delay Total Delay LOS			Yes	Yes Max							
Recall Mode Act Effct Green (s) Actuated g/C Ratio //c Ratio Control Delay Queue Delay Total Delay LOS				Max							
Act Effct Green (s) Actuated g/C Ratio V/c Ratio Control Delay Queue Delay Total Delay LOS						Max	C-Max			C-Max	
Actuated g/C Ratio v/c Ratio Control Delay Queue Delay Total Delay LOS				19.4			34.6			19.6	
v/c Ratio Control Delay Queue Delay Total Delay LOS				0.26			0.46			0.26	
Queue Delaý Total Delay LOS				0.77			0.82			0.63	
Total Delay LOS				28.6			12.0			26.2	
LOS				0.0			0.0			0.2	
				28.6			12.0			26.4	
Approach Delay				С			В			С	
				28.6			12.0			26.4	
Approach LOS				С			В			С	
Queue Length 50th (m)				40.8			10.3			30.8	
Queue Length 95th (m)				54.9			m24.2			46.2	
nternal Link Dist (m)	130.6			383.3			80.8			138.4	
Turn Bay Length (m)											
Base Capacity (vph)				1205			1101			822	
Starvation Cap Reductn				0			0			0	
Spillback Cap Reductn				0			0			29	
Storage Cap Reductn Reduced v/c Ratio				0 0.77			0 0.82			0 0.65	
				0.77			0.82			0.65	
Intersection Summary											
Cycle Length: 75											
Actuated Cycle Length: 75											
Offset: 70 (93%), Referenced to phas	se 2:NBTL	and 6:SE	1, Start o	of Green							
Natural Cycle: 70 Control Type: Actuated-Coordinated											

Synchro 10 Light Report Page 7

Lanes,	Volumes	, Timings
4: Bank	& Cathe	erine

2029 Future Background 05-16-2024

Lane Group	Ø7	Ø9	Ø13
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Satd. Flow (prot)			_
Flt Permitted			
Satd. Flow (perm)			
Satd. Flow (RTOR)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	7	9	13
Permitted Phases	1	3	13
Detector Phase			
Switch Phase			
	1.0	10	1.0
Minimum Initial (s)	1.0	1.0	1.0
Minimum Split (s)	5.0	5.0	5.0
Total Split (s)	5.0	5.0	5.0
Total Split (%)	7%	7%	7%
Yellow Time (s)	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lead		Lead
Lead-Lag Optimize?	Yes		Yes
Recall Mode	Max	Max	Max
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			_
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (m)			_
Queue Length 95th (m)			_
Internal Link Dist (m)			
Turn Bay Length (m)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			
Reduced v/c Ratio			_

Lanes, Volumes, Timings 4: Bank & Catherine		2029 Future Background 05-16-2024
Maximum v/c Ratio: 0.82		
Intersection Signal Delay: 21.7	Intersection LOS: C	
Intersection Capacity Utilization 80.1%	ICU Level of Service D	

Analysis Period (min) 15 m Volume for 95th percentile queue is metered by upstream signal.

#### Splits and Phases: 4: Bank & Catherine



30-48 Chamberlain AM Peak Hour

30-48 Chamberlain AM Peak Hour

	≯	-	$\rightarrow$	1	+	*	1	1	1	1	÷.	*
ane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SE
ane Configurations		-{î†	1					<b>≜</b> †⊅		٢	1	
Traffic Volume (vph)	87	574	88	0	0	0	0	834	181	215	415	
Future Volume (vph)	87	574	88	0	0	0	0	834	181	215	415	
Satd. Flow (prot)	0	3292	1483	0	0	0	0	3117	0	1658	1745	
It Permitted		0.993								0.167		
Satd. Flow (perm)	0	3285	1334	0	0	0	0	3117	0	284	1745	
Satd. Flow (RTOR)			134					37				
ane Group Flow (vph)	0	661	88	0	0	0	0	1015	0	215	415	
Turn Type	Perm	NA	Perm					NA		pm+pt	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4							6		
Detector Phase	4	4	4					2		1	6	
Switch Phase												
Vinimum Initial (s)	10.0	10.0	10.0					10.0		5.0	10.0	
/linimum Split (s)	26.2	26.2	26.2					23.1		11.1	23.1	
Γotal Split (s)	29.0	29.0	29.0					31.0		15.0	46.0	
Γotal Split (%)	38.7%	38.7%	38.7%					41.3%		20.0%	61.3%	
rellow Time (s)	3.3	3.3	3.3					3.0		3.0	3.0	
All-Red Time (s)	2.9	2.9	2.9					3.1		3.1	3.1	
ost Time Adjust (s).		0.0	0.0					0.0		0.0	0.0	
Fotal Lost Time (s)		6.2	6.2					6.1		6.1	6.1	
_ead/Lag								Lead		Lag		
ead-Lag Optimize?								Yes		Yes		
Recall Mode	None	None	None					C-Max		None	C-Max	
Act Effct Green (s)		19.9	19.9					27.8		42.8	42.8	
Actuated g/C Ratio		0.27	0.27					0.37		0.57	0.57	
//c Ratio		0.76	0.19					0.86		0.66	0.42	
Control Delay		31.1	2.5					31.9		30.0	8.4	
Queue Delay		0.0	0.0					0.0		0.0	1.4	
Fotal Delay		31.1	2.5					31.9		30.0	9.9	
.0S		С	A					С		С	A	
Approach Delay		27.8						31.9			16.7	
Approach LOS		С						С			В	
Queue Length 50th (m)		44.2	0.0					67.6		18.8	20.5	
Queue Length 95th (m)		59.6	4.2					#110.8		m#41.0	m28.6	
nternal Link Dist (m)		176.4			219.4			129.7			80.8	
Furn Bay Length (m)			30.0									
Base Capacity (vph)		998	498					1176		325	994	
Starvation Cap Reductn		0	0					0		0	380	
Spillback Cap Reductn		0	0					0		0	0	
Storage Cap Reductn		0	0					0		0	0	
Reduced v/c Ratio		0.66	0.18					0.86		0.66	0.68	
tersection Summary Cycle Length: 75 Actuated Cycle Length: 75												

Synchro 10 Light Report Page 1

Lanes, Volumes, Timings 5: Bank & Chamberlain/Isabella		2029 Future Background 04/13/2023
Maximum v/c Ratio: 0.86		
Intersection Signal Delay: 26.6	Intersection LOS: C	
Intersection Capacity Utilization 82.3%	ICU Level of Service E	
Analysis Period (min) 15		
# 95th percentile volume exceeds capacity, queue	may be longer.	
Queue shown is maximum after two cycles.		
m Volume for 95th percentile queue is metered by	upstream signal.	

Splits and Phases: 5: Bank & Chamberlain/Isabella

Ø2 (R)	Ø1	<b>↓</b> <sub>Ø4</sub>
31 s	15 s	29 s
Ø6 (R)		
46 s		

30-48 Chamberlain AM Peak Hour

ane Group ane Configurations raffic Volume (vph) uture Volume (vph)	EBL					· ·	~		~			- 🖌
ane Configurations raffic Volume (vph)		EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBF
raffic Volume (vph)		LDI	LDIX	TIDE	441	TIDIX	HDL	ND1	HDIT	ODL	1001	100
	0	0	0	245	557	0	0	0	0	0	438	26
	0	0	0	245	557	0	0	0	0	0	438	20
atd. Flow (prot)	0	0	0	245	4693	0	0	0	0	0	1745	148
It Permitted	0	0	0	0	0.985	0	0	0	U	0	1745	140
atd. Flow (perm)	0	0	0	0	4657	0	0	0	0	0	1745	144
atd. Flow (RTOR)	0	U	0	0	152	0	0	0	U	0	174J	7
ane Group Flow (vph)	0	0	0	0	802	0	0	0	0	0	438	26
urn Type	U	U	U	Perm	NA	v	0	0	v	0	NA	Peri
rotected Phases				1 Cilli	6						4	1 011
ermitted Phases				6	0						7	
letector Phase				6	6						4	
witch Phase				0	0						т	
linimum Initial (s)				10.0	10.0						10.0	10.
finimum Split (s)				26.2	26.2						28.3	28
otal Split (s)				28.0	28.0						47.0	47
otal Split (%)				37.3%	37.3%						62.7%	62.7
ellow Time (s)				3.3	3.3						3.3	3.
II-Red Time (s)				1.9	1.9						2.0	2
ost Time Adjust (s)				1.5	0.0						0.0	0
otal Lost Time (s)					5.2						5.3	5
ead/Lag					0.2						0.0	0.
ead-Lag Optimize?												
lecall Mode				C-Max	C-Max						Max	Ма
ct Effct Green (s)				0-IVIGA	22.8						41.7	41
ctuated g/C Ratio					0.30						0.56	0.5
/c Ratio					0.53						0.45	0.3
Control Delay					16.7						11.8	7
lueue Delay					0.0						0.0	0
otal Delay					16.7						11.8	7.
OS					B						B	
pproach Delay					16.7						10.2	
pproach LOS					B						B	
lueue Length 50th (m)					9.4						33.7	13
Queue Length 95th (m)					15.2						53.9	25
nternal Link Dist (m)		117.8			157.8			120.4			277.6	20
urn Bay Length (m)		117.0			107.0			120.4			211.0	
ase Capacity (vph)					1521						970	83
tarvation Cap Reductn					0						0	00
pillback Cap Reductn					0						0	
torage Cap Reductn					0						0	
teduced v/c Ratio					0.53						0.45	0.3
ntersection Summary					0.00						0.10	0.0
cycle Length: 75												_
ctuated Cycle Length: 75												
Offset: 24 (32%), Referenced	to phase	2. and 6.	WBTI S	tart of G	een							

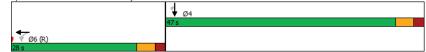
Synchro 10 Light Report Page 1 Lanes, Volumes, Timings 1: HWY 417 OR/Lyon & Catherine Maximum v/c Ratio: 0.53

Maximum V/c Ratio: 0.53		
Intersection Signal Delay: 13.6	Intersection LOS: B	
Intersection Capacity Utilization 54.1%	ICU Level of Service A	
Analysis Period (min) 15		

2029 Future Background 05-16-2024

Splits and Phases: 1: HWY 417 OR/Lyon & Catherine

30-48 Chamberlain PM PEAK HOUR



	≯	-	$\mathbf{r}$	-	-		-	<b>†</b>	1	1	÷.	~
ane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBF
ane Configurations					<b>≜</b> †}⊧	1		4412				
raffic Volume (vph)	0	0	0	0	699	340	25	761	0	0	0	1
uture Volume (vph)	0	0	0	0	699	340	25	761	0	0	0	
Satd. Flow (prot)	0	0	0	0	3143	1350	0	4755	0	0	0	
It Permitted								0.998				
Satd. Flow (perm)	0	0	0	0	3143	1247	0	4752	0	0	0	
Satd. Flow (RTOR)								70				
ane Group Flow (vph)	0	0	0	0	733	306	0	786	0	0	0	1
urn Type					NA	Perm	Perm	NA				
Protected Phases					6			8				
Permitted Phases						6	8					
Detector Phase					6	6	8	8				
Switch Phase												
Ainimum Initial (s)					10.0	10.0	10.0	10.0				
/linimum Split (s)					27.8	27.8	17.8	17.8				
otal Split (s)					38.0	38.0	32.0	32.0				
otal Split (%)					50.7%	50.7%	42.7%	42.7%				
ellow Time (s)					3.3	3.3	3.3	3.3				
All-Red Time (s)					2.5	2.5	2.5	2.5				
ost Time Adjust (s)					0.0	0.0		0.0				
otal Lost Time (s)					5.8	5.8		5.8				
.ead/Lag					Lag	Lag						
ead-Lag Optimize?					Ŭ	0						
Recall Mode					C-Max	C-Max	Max	Max				
Act Effct Green (s)					32.2	32.2		26.2				
Actuated g/C Ratio					0.43	0.43		0.35				
//c Ratio					0.54	0.57		0.46				
Control Delay					15.5	17.8		18.2				
Queue Delay					0.0	0.0		0.0				
Total Delay					15.5	17.8		18.2				
.0S					В	В		В				
Approach Delay					16.1			18.2				
Approach LOS					В			В				
Queue Length 50th (m)					35.1	29.3		28.0				
Queue Length 95th (m)					m40.3	m36.9		38.3				
nternal Link Dist (m)		157.8			130.6			43.8			56.6	
furn Bay Length (m)												
Base Capacity (vph)					1349	535		1705				
Starvation Cap Reductn					0	0		0				
Spillback Cap Reductn					0	0		0				
Storage Cap Reductn					0	0		0				
Reduced v/c Ratio					0.54	0.57		0.46				
ntersection Summary												
Cycle Length: 75												
Actuated Cycle Length: 75												
Offset: 12 (16%), Reference	to phase	2: and 6:	WBT. Sta	rt of Gre	en							

Synchro 10 Light Report Page 3

	9 Future Background
2: Kent & Catherine	05-16-2024

Lane Group	Ø5
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	5
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	5.0
Total Split (s)	5.0
Total Split (%)	7%
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	
Recall Mode	Max
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (m)	
Queue Length 95th (m)	
Internal Link Dist (m)	
Turn Bay Length (m)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

30-48 Chamberlain PM PEAK HOUR

Lanes, Volumes, Timings	2029 Future Background
2: Kent & Catherine	05-16-2024
Maximum v/c Ratio: 0.57	

Intersection Signal Delay. 17.0	Intersection LOS. B					
Intersection Capacity Utilization 52.7%	ICU Level of Service A					
Analysis Period (min) 15						
m Volume for 95th percentile queue is metered by upstream signal.						
Splits and Phases: 2: Kent & Catherine						

●øs ← ø6 (R)	<b>≜</b> ¶ <sub>Ø8</sub>
5 s 38 s	32 s

	⊁	-	-		1	1		
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø4	
Lane Configurations		<b>^</b>						
Traffic Volume (vph)	0	772	0	0	0	0		
Future Volume (vph)	0	772	0	0	0	0		
Satd. Flow (prot)	0	3316	0	0	0	0		
Flt Permitted								
Satd. Flow (perm)	0	3316	0	0	0	0		
Satd. Flow (RTOR)								
Lane Group Flow (vph)	0	772	0	0	0	0		
Turn Type		NA						
Protected Phases		2					4	
Permitted Phases								
Detector Phase		2						
Switch Phase								
Minimum Initial (s)		10.0					10.0	
Minimum Split (s)		36.0					21.0	
Total Split (s)		36.0					21.0	
Total Split (%)		63.2%					37%	
Yellow Time (s)		3.3					3.0	
All-Red Time (s)		1.7					1.0	
Lost Time Adjust (s)		0.0						
Total Lost Time (s)		5.0						
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode		Min					None	
Act Effct Green (s)		34.6						
Actuated g/C Ratio		0.83						
v/c Ratio		0.28						
Control Delay		4.3						
Queue Delay		0.0						
Total Delay		4.3						
LOS		А						
Approach Delay		4.3						
Approach LOS		А						
Queue Length 50th (m)		0.0						
Queue Length 95th (m)		32.2						
Internal Link Dist (m)		270.2	176.4		23.7			
Turn Bay Length (m)								
Base Capacity (vph)		2738						
Starvation Cap Reductn		0						
Spillback Cap Reductn		0						
Storage Cap Reductn		0						
Reduced v/c Ratio		0.28						
Intersection Summary								
Cycle Length: 57								
Actuated Cycle Length: 41.9								
Natural Cycle: 60								
Control Type: Semi Act-Uncoor	ď							
Maximum v/c Ratio: 0.28								

30-48 Chamberlain PM PEAK HOUR

Lanes, Volumes, Timings 3: Chamberlain & Kent	2029 Future Backgrour 05-16-20
Intersection Signal Delay: 4.3	Intersection LOS: A
Intersection Capacity Utilization 26.7%	ICU Level of Service A
Analysis Period (min) 15	
Splits and Phases: 3: Chamberlain & Kent	
ø2	* k <sub>04</sub>
36.0	21 a

	≯	-	~	-	+		•	1	-	1	Ţ	1
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SB
Lane Configurations	202	201	2011		414			41	HBR	002	<b>†</b> 1 <sub>2</sub>	
Traffic Volume (vph)	0	0	0	287	618	175	214	357	0	0	643	13
Future Volume (vph)	0	0	0	287	618	175	214	357	0	0	643	13
Satd. Flow (prot)	0	0	0	0	4536	0	0	3256	0	0	3063	T.
Flt Permitted	U	0	0	0	0.987	0	0	0.545	0	0	5005	
Satd. Flow (perm)	0	0	0	0	4474	0	0	1770	0	0	3063	
Satd. Flow (RTOR)	v	v	U	v	50	0	v	1110	U	U	32	
Lane Group Flow (vph)	0	0	0	0	1080	0	0	571	0	0	773	
Turn Type	v	v	U	Perm	NA	0	pm+pt	NA	U	U	NA	
Protected Phases				1 Unit	8		5	2			6	
Permitted Phases				8	Ū		2	2			Ū	
Detector Phase				8	8		5	2			6	
Switch Phase				0	5		5	2			5	
Vinimum Initial (s)				10.0	10.0		5.0	10.0			10.0	
Vinimum Split (s)				23.6	23.6		10.4	21.4			21.4	
Total Split (s)				24.0	24.0		14.0	41.0			27.0	
Total Split (%)				32.0%	32.0%		18.7%	54.7%			36.0%	
Yellow Time (s)				3.3	3.3		3.3	3.3			3.3	
All-Red Time (s)				2.3	2.3		2.1	2.1			2.1	
Lost Time Adjust (s)				2.0	0.0		2.1	0.0			0.0	
Total Lost Time (s)					5.6			5.4			5.4	
Lead/Lag				Lag	Lag			5.4			Lag	
Lead-Lag Optimize?				Lug	Lug						Yes	
Recall Mode				Max	Max		Max	C-Max			C-Max	
Act Effct Green (s)				WIGA	18.4		Max	35.6			21.6	
Actuated g/C Ratio					0.25			0.47			0.29	
v/c Ratio					0.95			0.57			0.86	
Control Delay					45.4			12.6			35.4	
Queue Delay					0.1			0.0			3.7	
Total Delay					45.5			12.6			39.1	
LOS					D			с			D	
Approach Delay					45.5			12.6			39.1	
Approach LOS					D			в			D	
Queue Length 50th (m)					52.8			15.8			51.8	
Queue Length 95th (m)					#79.9			20.0			#81.8	
Internal Link Dist (m)		130.6			383.3			80.8			138.4	
Turn Bay Length (m)		100.0			000.0			00.0			100.1	
Base Capacity (vph)					1135			1010			904	
Starvation Cap Reductn					0			0			0	
Spillback Cap Reductn					1			Ű			73	
Storage Cap Reductn					0			0			0	
Reduced v/c Ratio					0.95			0.57			0.93	
Intersection Summary												
Cycle Length: 75												
Actuated Cycle Length: 75												
Offset: 50 (67%), Referenced	to phase	2:NBTL a	and 6:SB	T, Start o	of Green							
Natural Cycle: 70												
Control Type: Actuated-Coor	dinatod											

Synchro 10 Light Report Page 7

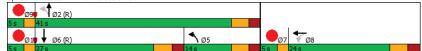
Lanes, Volumes, Timings
4: Bank & Catherine

2029 Future Background 05-16-2024

Lane Group	Ø7	Ø9	Ø13
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Satd. Flow (RTOR)			
Lane Group Flow (vph)		_	
Turn Type	-	6	40
Protected Phases	7	9	13
Permitted Phases			
Detector Phase			
Switch Phase			
Minimum Initial (s)	1.0	1.0	1.0
Minimum Split (s)	5.0	5.0	5.0
Total Split (s)	5.0	5.0	5.0
Total Split (%)	7%	7%	7%
Yellow Time (s)	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0
Total Lost Time (s)			
	Land	_	Les 1
Lead/Lag	Lead		Lead
Lead-Lag Optimize?			Yes
Recall Mode	Max	Max	Max
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (m)		_	
Queue Length 95th (m)			
Internal Link Dist (m)		_	
Turn Bay Length (m)		_	
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			
Intersection Summary			
intersection outfinially			

Lanes, Volumes, Timings 4: Bank & Catherine		2029 Future Background 05-16-2024
Maximum v/c Ratio: 0.95		
Intersection Signal Delay: 35.7	Intersection LOS: D	
Intersection Capacity Utilization 80.5%	ICU Level of Service D	
Analysis Period (min) 15		
# 95th percentile volume exceeds capacity, queu	e may be longer.	
Queue shown is maximum after two cycles.		

Splits and Phases: 4: Bank & Catherine



30-48 Chamberlain PM PEAK HOUR

Synchro 10 Light Report Page 9

30-48 Chamberlain PM PEAK HOUR

	۶	-	$\rightarrow$	∢	+	*	1	1	1	1	÷.	-
ane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SB
ane Configurations		<b>4</b> ₽	1					<b>≜</b> î≽			- <b>↑</b> Ъ	
Traffic Volume (vph)	53	590	120	0	0	0	0	500	91	175	720	
Future Volume (vph)	53	590	120	0	0	0	0	500	91	175	720	
Satd. Flow (prot)	0	3302	1483	0	0	0	0	3115	0	0	3283	
Flt Permitted		0.996									0.705	
Satd. Flow (perm)	0	3299	1345	0	0	0	0	3115	0	0	2296	
Satd. Flow (RTOR)			134					29				
ane Group Flow (vph)	0	643	120	0	0	0	0	591	0	0	895	
Turn Type	Perm	NA	Perm					NA		pm+pt	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4							6		
Detector Phase	4	4	4					2		1	6	
Switch Phase												
Vinimum Initial (s)	10.0	10.0	10.0					10.0		5.0	10.0	
Vinimum Split (s)	26.2	26.2	26.2					23.1		11.1	23.1	
Total Split (s)	31.0	31.0	31.0					30.0		14.0	44.0	
Total Split (%)	41.3%	41.3%	41.3%					40.0%		18.7%	58.7%	
Yellow Time (s)	3.3	3.3	3.3					3.0		3.0	3.0	
All-Red Time (s)	2.9	2.9	2.9					3.1		3.1	3.1	
ost Time Adjust (s)		0.0	0.0					0.0			0.0	
Total Lost Time (s)		6.2	6.2					6.1			6.1	
_ead/Lag								Lead		Lag		
_ead-Lag Optimize?								Yes		Yes		
Recall Mode	None	None	None					C-Max		None	C-Max	
Act Effct Green (s)		20.5	20.5					42.2			42.2	
Actuated g/C Ratio		0.27	0.27					0.56			0.56	
//c Ratio		0.71	0.26					0.33			0.69	
Control Delay		29.0	4.7					9.6			13.7	
Queue Delay		0.0	0.0					0.0			3.0	
Total Delay		29.0	4.7					9.6			16.7	
LOS		С	A					A			В	
Approach Delay		25.2						9.6			16.7	
Approach LOS		С						A			В	
Queue Length 50th (m)		43.2	0.0					20.3			71.5	
Queue Length 95th (m)		55.3	8.7					34.4			m84.2	
nternal Link Dist (m)		176.4			219.4			129.7			80.8	
Turn Bay Length (m)			30.0									
Base Capacity (vph)		1090	534					1765			1291	
Starvation Cap Reductn		0	0					0			283	
Spillback Cap Reductn		0	0					0			0	
Storage Cap Reductn		0	0					0			0	
Reduced v/c Ratio		0.59	0.22					0.33			0.89	
ntersection Summary												
Cycle Length: 75												
Actuated Cycle Length: 75												
Offset: 60 (80%), Reference	ed to phase	2·NRT a	ind 6:SBTI	Start of	Green							

Synchro 10 Light Report Page 11 Lanes, Volumes, Timings 5: Bank & Chamberlain/Isabella

2029 Future	Background
	05-16-2024

Maximum v/c Ratio: 0.71		
Intersection Signal Delay: 17.7	Intersection LOS: B	
Intersection Capacity Utilization 82.7%	ICU Level of Service E	
Analysis Period (min) 15		

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

Splits and Phases: 5: Bank & Chamberlain/Isabella

Ø2 (R)		Ø1	÷04
30 s	1	.4s	31 s
Ø6 (R)			
44 s			

30-48 Chamberlain PM PEAK HOUR



2024 Future Total Conditions



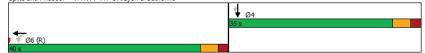
	≯	-	$\mathbf{x}$	1	-		1	<b>†</b>	1	1	÷.	4
ane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBF
ane Configurations					441>						1	ĩ
Traffic Volume (vph)	0	0	0	226	220	0	0	0	0	0	258	12
Future Volume (vph)	0	0	0	226	220	0	0	0	0	0	258	12
Satd. Flow (prot)	0	0	0	0	4645	0	0	0	0	0	1745	148
It Permitted					0.975							
Satd. Flow (perm)	0	0	0	0	4611	0	0	0	0	0	1745	145
Satd. Flow (RTOR)					226		-	-				12
ane Group Flow (vph)	0	0	0	0	446	0	0	0	0	0	258	12
Turn Type				Perm	NA						NA	Perr
Protected Phases					6						4	
Permitted Phases				6								
Detector Phase				6	6						4	
Switch Phase					-							
Minimum Initial (s)				10.0	10.0						10.0	10.
Vinimum Split (s)				26.2	26.2						28.3	28.
Fotal Split (s)				40.0	40.0						35.0	35.
Fotal Split (%)				53.3%	53.3%						46.7%	46.79
fellow Time (s)				3.3	3.3						3.3	3.
All-Red Time (s)				1.9	1.9						2.0	2.
ost Time Adjust (s)				1.5	0.0						0.0	2. 0.
Total Lost Time (s)					5.2						5.3	5.
_ead/Lag					J.2						5.5	J.
_ead-Lag Optimize?												
Recall Mode				C-Max	C-Max						Max	Ма
Act Effct Green (s)				U-IVIAX	34.8						29.7	29.
Actuated g/C Ratio					0.46						0.40	29.
//c Ratio					0.40						0.40	0.4
					10.20							
Control Delay											18.1	3.
Queue Delay					0.0						0.0	0.
Fotal Delay					10.5						18.1	3.
LOS					B						B	,
Approach Delay					10.5						13.4	
Approach LOS					B						В	
Queue Length 50th (m)					17.6						25.1	0.
Queue Length 95th (m)					26.4						42.7	9.:
nternal Link Dist (m)		117.8			157.8			120.4			277.6	
furn Bay Length (m)												
Base Capacity (vph)					2260						691	65
Starvation Cap Reductn					0						0	
Spillback Cap Reductn					0						0	
Storage Cap Reductn					0						0	
Reduced v/c Ratio					0.20						0.37	0.2
ntersection Summary												
Cycle Length: 75												
Actuated Cycle Length: 75												
Offset: 48 (64%), Reference	d to phase	2: and 6:	WBTL. S	start of Gr	reen							

Synchro 10 Light Report Page 1

Lanes, Volumes, Timings 1: HWY 417 OR/Lyon & Catherine		2024 Future Total 05-16-2024
Maximum v/c Ratio: 0.37		
Intersection Signal Delay: 11.8	Intersection LOS: B	
Intersection Capacity Utilization 47.8%	ICU Level of Service A	
Analysis Period (min) 15		

Splits and Phases: 1: HWY 417 OR/Lyon & Catherine

30-48 Chamberlain AM Peak Hour



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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBI
ane Configurations					<b>≜</b> î≽	1		4412				
Fraffic Volume (vph)	0	0	0	0	394	539	54	1373	0	0	0	
Future Volume (vph)	0	0	0	0	394	539	54	1373	0	0	0	
Satd. Flow (prot)	0	0	0	0	2917	1350	0	4755	0	0	0	
Fit Permitted								0.998				
Satd. Flow (perm)	0	0	0	0	2917	1262	0	4750	0	0	0	
Satd. Flow (RTOR)								70				
ane Group Flow (vph)	0	0	0	0	642	291	0	1427	0	0	0	
Turn Type					NA	Perm	Perm	NA				
Protected Phases					6			8				
Permitted Phases						6	8					
Detector Phase					6	6	8	8				
Switch Phase												
Minimum Initial (s)					10.0	10.0	10.0	10.0				
Vinimum Split (s)					27.8	27.8	17.8	17.8				
Total Split (s)					32.0	32.0	38.0	38.0				
Total Split (%)					42.7%	42.7%	50.7%	50.7%				
Yellow Time (s)					3.3	3.3	3.3	3.3				
All-Red Time (s)					2.5	2.5	2.5	2.5				
ost Time Adjust (s)					0.0	0.0		0.0				
Total Lost Time (s)					5.8	5.8		5.8				
Lead/Lag					Lag	Lag						
Lead-Lag Optimize?					Ū	Ū						
Recall Mode					C-Max	C-Max	Max	Max				
Act Effct Green (s)					26.2	26.2		32.2				
Actuated g/C Ratio					0.35	0.35		0.43				
v/c Ratio					0.63	0.66		0.69				
Control Delay					26.2	30.0		18.5				
Queue Delay					0.0	0.0		0.0				
Total Delay					26.2	30.0		18.5				
OS					С	С		В				
Approach Delay					27.4			18.5				
Approach LOS					С			В				
Queue Length 50th (m)					43.7	40.0		54.6				
Queue Length 95th (m)					m60.7	m56.8		69.8				
nternal Link Dist (m)		157.8			130.6			47.0			56.6	
Turn Bay Length (m)												
Base Capacity (vph)					1019	440		2079				
Starvation Cap Reductn					0	0		0				
Spillback Cap Reductn					0	0		0				
Storage Cap Reductn					0	0		0				
Reduced v/c Ratio					0.63	0.66		0.69				
Intersection Summary												
Cycle Length: 75		_				_				_		
Actuated Cycle Length: 75												
Offset: 15 (20%), Referenced	to phase	2: and 6:	NRT Sta	art of Gro	on							

Synchro 10 Light Report Page 3

Lanes, Volumes, Timings	2024 Future Total
2: Kent & Catherine	05-16-2024

Lane Group	Ø5		
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Satd. Flow (RTOR)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	5		
Permitted Phases			
Detector Phase			
Switch Phase			
Minimum Initial (s)	1.0		
Minimum Split (s)	5.0		
Total Split (s)	5.0		
Total Split (%)	7%		
Yellow Time (s)	2.0		
All-Red Time (s)	0.0		
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lead		
Lead-Lag Optimize?			
Recall Mode	Max		
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (m)			
Queue Length 95th (m)			
Internal Link Dist (m)			
Turn Bay Length (m)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

30-48 Chamberlain AM Peak Hour

Maximum v/c Ratio: 0.69		
ntersection Signal Delay: 22.0	Intersection LOS: C	
ntersection Capacity Utilization 65.7%	ICU Level of Service C	
Analysis Period (min) 15		
m Volume for 95th percentile queue is metered by	upstream signal.	

Splits and Phases: 2: Kent & Catherine	
●øs ← øs (R)	1 p8
5 s 32 s	38 s

	٠		+	•	1	1		
	ED!		MOT	•		-	04	
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø4	
Lane Configurations	0	<b>↑↑</b> 757	0	0	0	0		
Traffic Volume (vph)	0	757	0	0	0	0		
Future Volume (vph) Satd. Flow (prot)	0	3316	0	0	0	0		
Sato. Flow (prot) Flt Permitted	0	3310	U	U	U	0		
	0	2240	0	0	0	0		
Satd. Flow (perm)	0	3316	U	0	U	0		
Satd. Flow (RTOR)	0	757	0	0	0	0		
Lane Group Flow (vph)	0	757	U	0	U	0		
Turn Type		NA						
Protected Phases		2					4	
Permitted Phases								
Detector Phase		2						
Switch Phase		10.0					10.0	
Minimum Initial (s)		10.0					10.0	
Minimum Split (s)		36.0					21.0	
Total Split (s)		36.0					21.0	
Total Split (%)		63.2%					37%	
Yellow Time (s)		3.3					3.0	
All-Red Time (s)		1.7					1.0	
Lost Time Adjust (s)		0.0						
Total Lost Time (s)		5.0						
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode		Min					None	
Act Effct Green (s)		32.7						
Actuated g/C Ratio		0.63						
v/c Ratio		0.36						
Control Delay		7.5						
Queue Delay		0.0						
Total Delay		7.5						
LOS		A						
Approach Delay		7.5						
Approach LOS		A						
Queue Length 50th (m)		21.8						
Queue Length 95th (m)		31.6						
Internal Link Dist (m)		270.2	176.4		31.3			
Turn Bay Length (m)								
Base Capacity (vph)		2162						
Starvation Cap Reductn		0						
Spillback Cap Reductn		Ű						
Storage Cap Reductn		0						
Reduced v/c Ratio		0.35						
Intersection Summary								
Cycle Length: 57								
Actuated Cycle Length: 51.6								
Natural Cycle: 60								
Control Type: Semi Act-Uncoo	rd							
Maximum v/c Ratio: 0.36	iu .							

Synchro 10 Light Report Page 5

Lanes, Volumes, Timings 3: Chamberlain & Kent		2024 Future Total 05-16-2024
Intersection Signal Delay: 7.5	Intersection LOS: A	
Intersection Capacity Utilization 26.3%	ICU Level of Service A	
Analysis Period (min) 15		
Splits and Phases: 3: Chamberlain & Kent		
<b>→</b> ø2	<b>Å</b> Åø₄	
36 e	21 c	

	≯		1	~	÷		*	†	*	7	1	
	EBL	EBT	♥ EBR	♥ WBL	WBT	WBR	NBL	NBT	NBR	SBL	♥ SBT	SE
ane Group ane Configurations	EDL	EDI	EDK	VVDL	4 <b>†</b> }	WDR	INDL		INDR	SDL	 <b>≜1</b> ≽	35
raffic Volume (vph)	0	0	0	160	4 T P 582	189	278	627	0	0	385	1
Future Volume (vph)	0	0	0	160	582	189	278	627	0	0	385	1
Satd. Flow (prot)	0	0	0	0	4481	0	210	3266	0	0	3011	
It Permitted	U	0	0	0	0.991	0	0	0.646	0	U	3011	
Satd. Flow (perm)	0	0	0	0	4429	0	0	2070	0	0	3011	
Satd. Flow (RTOR)	v	Ū	Ŭ	v	81	Ū	v	2010	Ŭ	Ū	47	
ane Group Flow (vph)	0	0	0	0	931	0	0	905	0	0	495	
urn Type	v	v	v	Perm	NA	Ŭ	pm+pt	NA	Ű	Ŭ	NA	
Protected Phases					8		5	2			6	
Permitted Phases				8	Ŭ		2	-				
Detector Phase				8	8		5	2			6	
Switch Phase				-	-		-	_			-	
linimum Initial (s)				10.0	10.0		5.0	10.0			10.0	
/inimum Split (s)				23.6	23.6		10.4	21.4			21.4	
otal Split (s)				25.0	25.0		15.0	40.0			25.0	
otal Split (%)				33.3%	33.3%		20.0%	53.3%			33.3%	
ellow Time (s)				3.3	3.3		3.3	3.3			3.3	
II-Red Time (s)				2.3	2.3		2.1	2.1			2.1	
ost Time Adjust (s)					0.0			0.0			0.0	
otal Lost Time (s)					5.6			5.4			5.4	
ead/Lag				Lag	Lag						Lag	
ead-Lag Optimize?				Yes	Yes						Yes	
Recall Mode				Max	Max		Max	C-Max			C-Max	
ct Effct Green (s)					19.4			34.6			19.6	
ctuated g/C Ratio					0.26			0.46			0.26	
/c Ratio					0.77			0.82			0.60	
Control Delay					28.6			12.3			25.5	
Queue Delay					0.0			0.0			0.1	
otal Delay					28.6			12.3			25.6	
OS					С			В			С	
pproach Delay					28.6			12.3			25.6	
pproach LOS					С			В			С	
ueue Length 50th (m)					40.8			10.7			29.0	
Queue Length 95th (m)					54.9			m29.3			43.9	
nternal Link Dist (m)		130.6			383.3			80.8			138.4	
urn Bay Length (m)					4005			4400			004	
ase Capacity (vph)					1205			1108			821	
tarvation Cap Reductn					0			0			0	
pillback Cap Reductn					0 0			0 0			27 0	
Storage Cap Reductn					0.77			0.82			0.62	
					0.11			0.02			0.02	
tersection Summary ycle Length: 75												_
ctuated Cycle Length: 75												
Offset: 70 (93%), Reference	d to phace	2·NRTL	and 6.CE	T Start o	f Green							
latural Cycle: 70	a to pliase		a lu 0.3E	, otari C	GIGGI							
control Type: Actuated-Cool	dinatod											

Synchro 10 Light Report Page 7

Lanes, Volumes, Timings	
4: Bank & Catherine	

2024 Future Total 05-16-2024

Lane Configurations Traffic Volume (vph) Future Volume (vph) Satd. Flow (port) FI Permitted Satd. Flow (porm) Satd. Flow (perm) Satd. Flow (Porm) Satd. Flow (RTOR) Lane Group Flow (vph) Tum Type Protected Phases Pertected Phases Detector Phase Minimum Initial (s) Minimum Split (s) Total Lost Time (s) Lead/Lag Lead-Lag Optimize? Recall Mode Act Effct Green (s) Actuated g/C Ratio V/c Ratio Control Delay Queue Delay Total Delay LOS Approach LOS Queue Length 95th (m) Internal Link Dist (m) Tum Bay Length (m) Base Capacity (vph) Starvation Cap Reductn Spliback Cap Reductn Spliback Cap Reductn		Ø7	Ø9	Ø13
Future Volume (vph) Satd. Flow (prot) Fit Permitted Satd. Flow (prot) Satd. Flow (perm) Satd. Flow (RTOR) Lane Group Flow (vph) Tum Type Protected Phases Detector Phase Switch Phase Minimum Initial (s) Minimum Split (s) Total Lost Time (s) Lead-Lag Optimize? Recall Mode Act Effct Green (s) Actuated g/C Ratio Vic Ratio Control Delay Queue Delay Total Delay LOS Approach Delay Approach Delay Approach Delay Approach Delay Martine (m) Tum Bay Length (m) Starvation Cap Reductn Spillback Cap Reductn				
Future Volume (vph) Satd. Flow (prot) Fit Permitted Satd. Flow (prot) Satd. Flow (perm) Satd. Flow (RTOR) Lane Group Flow (vph) Tum Type Protected Phases Detector Phase Switch Phase Minimum Initial (s) Minimum Split (s) Total Lost Time (s) Lead-Lag Optimize? Recall Mode Act Effct Green (s) Actuated g/C Ratio Vic Ratio Control Delay Queue Delay Total Delay LOS Approach Delay Approach Delay Approach Delay Approach Delay Martine (m) Tum Bay Length (m) Starvation Cap Reductn Spillback Cap Reductn				
Fit Permitted Satd. Flow (perm) Satd. Flow (perm) Satd. Flow (Perm) Lane Group Flow (vph) Turn Type Protected Phases Detector Phase Switch Phase Detector Phase Switch Phase Minimum Split (s) Total Split (s) Total Split (s) Total Split (s) Total Split (s) Total Split (s) Total Split (s) All-Red Time (s) Lost Time Adjust (s) Total Lost Time (s) Lost Time (s) All-Red Time (s) Actuated g/C Ratio Vic Ratio Control Delay LOS Approach Delay LOS Approach Delay Approach LOS Queue Length 50th (m) Internal Link Dist (m) Tum Bay Length (m) Base Capacity (vph) Starvation Cap Reductn Spillback Cap Reductn				
Fit Permitted Satd. Flow (perm) Satd. Flow (perm) Satd. Flow (Perm) Lane Group Flow (vph) Turn Type Protected Phases Detector Phase Switch Phase Detector Phase Switch Phase Minimum Split (s) Total Split (s) Total Split (s) Total Split (s) Total Split (s) Total Split (s) Total Split (s) All-Red Time (s) Lost Time Adjust (s) Total Lost Time (s) Lost Time (s) All-Red Time (s) Actuated g/C Ratio Vic Ratio Control Delay LOS Approach Delay LOS Approach Delay Approach LOS Queue Length 50th (m) Internal Link Dist (m) Tum Bay Length (m) Base Capacity (vph) Starvation Cap Reductn Spillback Cap Reductn				
Satd. Flow (RTOR) Lane Group Flow (vph) Turn Type Protected Phases Detector Phase Detector Phase Minimum Initial (s) Minimum Initial (s) Minimum Split (s) Total Split (s) Total Split (s) Total Split (s) Total Split (s) Lost Time Adjust (s) Total Lost Time (s) Lead/Lag Uptimize? Recall Mode Act Effct Green (s) Actuated g/C Ratio Vic Ratio Control Delay Queue Delay Total Delay LOS Approach Delay Approach Delay Approach Delay Approach Delay Approach LOS Queue Length 50th (m) Queue Length 95th (m) Internal Link Dist (m) Turm Bay Length (m) Base Capacity (vph) Starvation Cap Reductn Spillback Cap Reductn	,			
Satd. Flow (RTOR) Lane Group Flow (vph) Turn Type Protected Phases Detector Phase Detector Phase Minimum Initial (s) Minimum Initial (s) Minimum Split (s) Total Split (s) Total Split (s) Total Split (s) Total Split (s) Lost Time Adjust (s) Total Lost Time (s) Lead/Lag Uptimize? Recall Mode Act Effct Green (s) Actuated g/C Ratio Vic Ratio Control Delay Queue Delay Total Delay LOS Approach Delay Approach Delay Approach Delay Approach Delay Approach LOS Queue Length 50th (m) Queue Length 95th (m) Internal Link Dist (m) Turm Bay Length (m) Base Capacity (vph) Starvation Cap Reductn Spillback Cap Reductn	n)			
Lane Group Flow (vph) Turn Type Protected Phases Permitted Phases Permitted Phases Permitted Phases Switch Phase Minimum Initial (s) Minimum Split (s) Total Split (s) Total Split (%) Yellow Time (s) Lost Time (s) Lost Time Adjust (s) Total Lost Time (s) Lead/Lag Lead-Lag Optimize? Recall Mode Act Effct Green (s) Actuated g/C Ratio Vic Ratio Control Delay Queue Delay Total Delay LoS Approach Delay Approach Delay Approach Delay Approach Delay Approach LOS Queue Length 50th (m) Queue Length 50th (m) Turn Bay Length (m) Earvation Cap Reductn Spillback Cap Reductn				
Turn Type Protected Phases Permitted Phases Detector Phase Switch Phase Phase Switch Phase Switch Phase Sw				
Protected Phases Permitted Phases Detector Phase Switch Phase Switch Phase Minimum Initial (s) Total Split (s) Total Split (s) Total Split (s) Lost Time (s) Lead/Lag Lead-Lag Optimize? Recall Mode Act Effct Green (s) Actuated g/C Ratio V/c Ratio Control Delay Control Delay Queue Delay Total Delay LOS Approach Delay Approach Delay Approach Delay Approach Delay LOS Approach	( 1 /			
Permitted Phases Detector Phase Switch Phase Minimum Initial (s) Minimum Initial (s) Total Split (s) Total Split (%) Yellow Time (s) Lotal Split (%) Total Lost Time (s) Lead/Lag Optimize? Recall Mode Act Effct Green (s) Actuated g/C Ratio Vic Ratio Control Delay Queue Delay Total Delay LoS Approach Delay Approach Delay Approach Delay Approach Delay LoS Approach Delay LoS Queue Length 50th (m) Queue Length 95th (m) Internal Link Dist (m) Tum Bay Length (m) Base Capacity (vph) Starvation Cap Reductn Spillback Cap Reductn	es	7	9	13
Detector Phase Switch Phase Minimum Split (s) Total Split (s) Total Split (s) Total Split (s) Total Split (%) Yellow Time (s) Alr.Red Time (s) Lost Time Adjust (s) Total Lost Time (s) Lead/Lag Lead/Lag Lead/Lag Lead/Lag Lead/Lag Lead/Lag Lead/Lag Lead/Lag Lead/Lag Lead/Lag Lead/Lag Lead/Lag Lead/Lag Lead/Lag Lead/Lag Lead/Lag Lead/Lag Lead/Lag Lost Finter (s) Actuated g/C Ratio v/c Ratio Control Delay Control Delay Control Delay LOS Approach Delay Approach Delay Approach Delay Approach LOS Queue Length 50th (m) Internal Link Dist (m) Tum Bay Length (m) Base Capacity (vph) Starvation Cap Reductn Spillback Cap Reductn			5	
Switch Phase Minimum Initial (s) Minimum Split (s) Total Split (s) Total Split (s) Total Split (s) Lost Time (s) Lost Time (s) Lost Time (s) Lost Time (s) Lead/Lag Lead-Lag Optimize? Recall Mode Act Effct Green (s) Actuated g/C Ratio V/c Ratio V/				
Minimum Initial (s) Minimum Split (s) Total Split (%) Yellow Time (s) All-Red Time (s) Lead-Lag Optimize? Recall Mode Act Effct Green (s) Actuated g/C Ratio V/c Ratio Control Delay Queue Delay Total Delay LoS Approach Delay Approach Delay Approach Delay Approach Delay Approach Delay Mayroach Delay Mayroach Doth (m) Queue Length 50th (m) Tum Bay Length (m) Tum Bay Length (m) Starvation Cap Reductn Spillback Cap Reductn				
Minimum Split (s) Total Split (s) Total Split (s) Yellow Time (s) All-Red Time (s) Lost Time (s) Lost Time (s) Lead/Lag Optimize? Recall Mode Act Effct Green (s) Actuated g/C Ratio v/c Ratio Control Delay Queue Delay Total Delay Queue Delay Total Delay Queue Delay Total Delay Approach Delay Approach LOS Queue Length 50th (m) Queue Length 95th (m) Internal Link Dist (m) Tum Bay Length (m) Base Capacity (vph) Starvation Cap Reductn Spillback Cap Reductn	(s)	1.0	1.0	1.0
Total Split (s) Total Split (%) Yellow Time (s) All-Red Time (s) Lost Time Adjust (s) Total Lost Time (s) Lead/Lag Uptimize? Recall Mode Act Effct Green (s) Actuated g/C Ratio v/c Ratio Control Delay Queue Delay Total Delay LOS Approach Delay Approach Delay Approach Delay Approach Delay Approach LOS Queue Length 50th (m) Internal Link Dist (m) Tum Bay Length (m) Base Capacity (vph) Starvation Cap Reductn Spitlback Cap Reductn		5.0	5.0	5.0
Total Split (%) Yellow Time (s) All-Red Time (s) Lost Time Adjust (s) Total Lost Time (s) Lead/Lag Lead-Lag Optimize? Recall Mode Act Effct Green (s) Actuated g/C Ratio V/c Ratio V/c Ratio Control Delay Costrol Delay LOS Approach Delay LOS Approach Delay LOS Approach Delay LOS Queue Length 50th (m) Internal Link Dist (m) Tum Bay Length (m) Base Capacity (vph) Starvation Cap Reductn Spinlback Cap Reductn Spinlback Cap Reductn	5)	5.0	5.0	5.0
Yellow Time (s) All-Red Time (s) Lost Time A(just (s) Total Lost Time (s) Lead-Lag Optimize? Recall Mode Act Effct Green (s) Actuated g/C Ratio V(c Ratio Control Delay Queue Delay Total Delay LOS Approach Delay Approach Delay Approach Delay Approach Delay Cos Mueue Length 50th (m) Queue Length 95th (m) Internal Link Dist (m) Tum Bay Length (m) Base Capacity (vph) Starvation Cap Reductn Spillback Cap Reductn		7%	7%	7%
All-Red Time (s) Lost Time Adjust (s) Total Lost Time (s) Lead/Lag Optimize? Recall Mode Act Effct Green (s) Actuated g/C Ratio v/c Ratio Control Delay Queue Delay Total Delay Queue Delay Total Delay Approach Delay Approach Delay Approach Delay Approach Delay Approach LOS Queue Length 50th (m) Queue Length 95th (m) Internal Link Dist (m) Tum Bay Length (m) Base Capacity (vph) Starvation Cap Reductn Spillback Cap Reductn		2.0	2.0	2.0
Lost Time Adjust (s) Total Lost Time (s) Lead/Lag Lead-Lag Optimize? Recall Mode Act Effct Green (s) Actuated g/C Ratio v/c Ratio V/c Ratio Control Delay Queue Delay Total Delay LOS Approach Delay Approach Delay Approach Delay Approach Delay Approach Delay Approach Delay Martine Control (m) Queue Length 95th (m) Internal Link Dist (m) Tum Bay Length (m) Base Capacity (vph) Starvation Cap Reducth Spillback Cap Reductn		2.0	0.0	2.0
Total Lost Time (s) Lead/Lag Lead-Lag Optimize? Recall Mode Act Effct Green (s) Actuated g/C Ratio V/c Ratio Control Delay Queue Delay Total Delay LOS Approach Delay Approach Delay Approach LOS Queue Length 50th (m) Queue Length 95th (m) Internal Link Dist (m) Tum Bay Length (m) Base Capacity (vph) Starvation Cap Reductn Spillback Cap Reductn		0.0	0.0	0.0
Lead/Lag Lead-Lag Optimize? Recall Mode Act Effct Green (s) Actuated g/C Ratio V/c Ratio Control Delay Queue Delay Total Delay LOS Approach Delay Approach Delay Approach Delay Approach Delay Approach Delay Approach UOS Queue Length 95th (m) Internal Link Dist (m) Tum Bay Length (m) Base Capacity (vph) Starvation Cap Reductn Spillback Cap Reductn				
Lead-Lag Optimize? Recall Mode Act Effct Green (s) Actuated g/C Ratio v/c Ratio Control Delay Queue Delay Total Delay LOS Approach Delay Approach Delay Approach LOS Queue Length 50th (m) Queue Length 95th (m) Internal Link Dist (m) Tum Bay Length (m) Base Capacity (vph) Starvation Cap Reductn Spillback Cap Reductn	(5)	المعط		ا مع ا
Recall Mode Act Effct Green (s) Actuated g/C Ratio v/c Ratio Control Delay Queue Delay LOS Approach Delay Approach Delay Approach Delay Approach LOS Queue Length 50th (m) Queue Length 95th (m) Internal Link Dist (m) Tum Bay Length (m) Base Capacity (vph) Starvation Cap Reductn Spillback Cap Reductn	i=e2	Lead Yes		Lead Yes
Act Effct Green (s) Actuated g/C Ratio v/c Ratio Control Delay Queue Delay Total Delay LOS Approach Delay Approach Delay Approach Delay Approach LOS Queue Length 50th (m) Internal Link Dist (m) Turn Bay Length (m) Base Capacity (vph) Starvation Cap Reductn Spillback Cap Reductn	IIZe?		Maria	
Actuated g/C Ratio V/c Ratio Control Delay Queue Delay Total Delay LOS Approach Delay Approach Delay Approach LOS Queue Length 95th (m) Internal Link Dist (m) Tum Bay Length (m) Base Capacity (vph) Starvation Cap Reductn Spillback Cap Reductn	(-)	Max	Max	Max
v/c Ratio Control Delay Queue Delay Total Delay LOS Approach Delay Approach LOS Queue Length 50th (m) Queue Length 95th (m) Internal Link Dist (m) Tum Bay Length (m) Base Capacity (vph) Starvation Cap Reductn Spillback Cap Reductn Spillback Cap Reductn		_		_
Control Delay Queue Delay Total Delay LOS Approach Delay Approach LOS Queue Length 50th (m) Queue Length 95th (m) Internal Link Dist (m) Tum Bay Length (m) Base Capacity (vph) Starvation Cap Reductn Spillback Cap Reductn	atio			
Queue Delay Total Delay LOS Approach Delay Approach LOS Queue Length 50th (m) Queue Length 95th (m) Internal Link Dist (m) Turn Bay Length (m) Base Capacity (vph) Starvation Cap Reductn Spillback Cap Reductn Storage Cap Reductn				
Total Delay LOS Approach Delay Approach LOS Queue Length 50th (m) Queue Length 95th (m) Internal Link Dist (m) Tum Bay Length (m) Base Capacity (vph) Starvation Cap Reductn Spillback Cap Reductn Storage Cap Reductn				
LOS Approach Delay Approach LOS Queue Length 50th (m) Queue Length 95th (m) Internal Link Dist (m) Tum Bay Length (m) Base Capacity (vph) Starvation Cap Reductn Spillback Cap Reductn Storage Cap Reductn				
Approach Delay Approach LOS Queue Length 50th (m) Queue Length 95th (m) Internal Link Dist (m) Turn Bay Length (m) Base Capacity (vph) Starvation Cap Reductn Spillback Cap Reductn Storage Cap Reductn				
Approach LOS Queue Length 50th (m) Queue Length 95th (m) Internal Link Dist (m) Turn Bay Length (m) Base Capacity (vph) Starvation Cap Reductn Spillback Cap Reductn Storage Cap Reductn				
Queue Length 50th (m) Queue Length 95th (m) Internal Link Dist (m) Turn Bay Length (m) Base Capacity (vph) Starvation Cap Reductn Spillback Cap Reductn Storage Cap Reductn				
Queue Length 95th (m) Internal Link Dist (m) Turn Bay Length (m) Base Capacity (vph) Starvation Cap Reductn Spillback Cap Reductn Spillback Cap Reductn				
Internal Link Dist (m) Turn Bay Length (m) Base Capacity (vph) Starvation Cap Reductn Spillback Cap Reductn Storage Cap Reductn				
Turn Bay Length (m) Base Capacity (vph) Starvation Cap Reductn Spillback Cap Reductn Storage Cap Reductn				
Base Capacity (vph) Starvation Cap Reductn Spillback Cap Reductn Storage Cap Reductn				
Starvation Cap Reductn Spillback Cap Reductn Storage Cap Reductn				
Spillback Cap Reductn Storage Cap Reductn				
Storage Cap Reductn				
Reduced v/c Ratio				
	tio			
Internetion Common				
Intersection Summary	nmary			

Lanes, Volumes, Timings		2024 Future Total		
4: Bank & Catherine				
Maximum v/c Ratio: 0.82				
Intersection Signal Delay: 21.6	Intersection LOS: C			
Intersection Capacity Utilization 79.7%	ICU Level of Service D			

 Intersection Capacity Utilization 79.7%
 ICU

 Analysis Period (min) 15
 m

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

#### Splits and Phases: 4: Bank & Catherine



30-48 Chamberlain AM Peak Hour

Synchro 10 Light Report Page 9

30-48 Chamberlain AM Peak Hour

	۶	-	$\mathbf{\hat{v}}$	1	-	*	1	1	1	1	÷.	~
ane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SB
ane Configurations		<b>4</b> ₽	1					۴Þ		ሻ	<b>↑</b>	
raffic Volume (vph)	87	536	84	0	0	0	0	834	162	192	395	
uture Volume (vph)	87	536	84	0	0	0	0	834	162	192	395	
Satd. Flow (prot)	0	3292	1483	0	0	0	0	3137	0	1658	1745	
It Permitted		0.993								0.179		
Satd. Flow (perm)	0	3285	1334	0	0	0	0	3137	0	304	1745	
Satd. Flow (RTOR)			134					32				
ane Group Flow (vph)	0	623	84	0	0	0	0	996	0	192	395	
urn Type	Perm	NA	Perm					NA		pm+pt	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4							6		
Detector Phase	4	4	4					2		1	6	
Switch Phase												
/linimum Initial (s)	10.0	10.0	10.0					10.0		5.0	10.0	
/linimum Split (s)	26.2	26.2	26.2					23.1		11.1	23.1	
otal Split (s)	29.0	29.0	29.0					31.0		15.0	46.0	
otal Split (%)	38.7%	38.7%	38.7%					41.3%		20.0%	61.3%	
ellow Time (s)	3.3	3.3	3.3					3.0		3.0	3.0	
II-Red Time (s)	2.9	2.9	2.9					3.1		3.1	3.1	
ost Time Adjust (s)		0.0	0.0					0.0		0.0	0.0	
otal Lost Time (s)		6.2	6.2					6.1		6.1	6.1	
.ead/Lag								Lead		Lag		
ead-Lag Optimize?								Yes		Yes		
Recall Mode	None	None	None					C-Max		None	C-Max	
ct Effct Green (s)		19.3	19.3					28.4		43.4	43.4	
ctuated g/C Ratio		0.26	0.26					0.38		0.58	0.58	
/c Ratio		0.74	0.19					0.83		0.57	0.39	_
Control Delay		30.9	2.3					29.0		24.8	8.0	
Queue Delay		0.0	0.0					0.0		0.0	1.1	
otal Delay		30.9	2.3					29.0		24.8	9.2	
.OS		С	A					С		С	A	
pproach Delay		27.5						29.0			14.3	
pproach LOS		C	0.0					C		40.0	B	_
Queue Length 50th (m)		41.8	0.0					64.5		12.0	19.7	
Queue Length 95th (m)		55.7	3.5		040.4			#107.6		m33.4	m27.6	_
nternal Link Dist (m)		176.4	00.0		219.4			129.7			80.8	
urn Bay Length (m)		000	30.0					4007		220	4000	_
Base Capacity (vph)		998	498					1207 0		336	1009	
Starvation Cap Reductn		0	0					-		0	385	
Spillback Cap Reductn		0	0					0		0	0	
Storage Cap Reductn		-	-					0.83		-	0.63	_
Reduced v/c Ratio		0.62	0.17					0.83		0.57	0.63	
ntersection Summary												
Cycle Length: 75												
ctuated Cycle Length: 75												

Synchro 10 Light Report Page 11

Lanes, Volumes, Timings 5: Bank & Chamberlain/Isabella		2024 Future Total 05-16-2024
Maximum v/c Ratio: 0.83		
Intersection Signal Delay: 24.8	Intersection LOS: C	
Intersection Capacity Utilization 79.1%	ICU Level of Service D	
Analysis Period (min) 15		
# 95th percentile volume exceeds capacity, queue	may be longer.	
Queue shown is maximum after two cycles.		

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

Splits and Phases: 5: Bank & Chamberlain/Isabella

Ø2 (R)	Ø1	<b>₩</b> Ø4	
31 s	15 s	29 s	
Ø6 (R)			
46 s			

30-48 Chamberlain AM Peak Hour

HWY 417 OR/Lyon & Catherine												
	≯	-	$\mathbf{\hat{z}}$	-	-	*	1	- †	1	1	÷.	-
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBF
Lane Configurations					441>						•	1
Traffic Volume (vph)	0	0	0	221	499	0	0	0	0	0	392	264
Future Volume (vph)	0	0	0	221	499	0	0	0	0	0	392	264
Satd. Flow (prot)	0	0	0	0	4693	0	0	0	0	0	1745	1483
Flt Permitted					0.985							
Satd. Flow (perm)	0	0	0	0	4657	0	0	0	0	0	1745	1443
Satd. Flow (RTOR)					154							98
Lane Group Flow (vph)	0	0	0	0	720	0	0	0	0	0	392	264
Turn Type				Perm	NA						NA	Perm
Protected Phases					6						4	
Permitted Phases				6	-							4
Detector Phase				6	6						4	4
Switch Phase				, v	Ŭ							
Minimum Initial (s)				10.0	10.0						10.0	10.0
Minimum Split (s)				26.2	26.2						28.3	28.3
Total Split (s)				28.0	28.0						47.0	47.0
Total Split (%)				37.3%	37.3%						62.7%	62.7%
Yellow Time (s)				3.3	3.3						3.3	3.3
All-Red Time (s)				1.9	1.9						2.0	2.0
Lost Time Adjust (s)				1.9	0.0						2.0	2.0
					5.2						5.3	5.3
Total Lost Time (s)					5.2						5.3	5.3
Lead/Lag												
Lead-Lag Optimize?				0.14-11	C-Max						Maria	Mari
Recall Mode				C-Max							Max	Max
Act Effct Green (s)					22.8						41.7	41.7
Actuated g/C Ratio					0.30						0.56	0.56
v/c Ratio					0.47						0.40	0.31
Control Delay					16.0						11.1	6.6
Queue Delay					0.0						0.0	0.0
Total Delay					16.0						11.1	6.6
LOS					В						В	A
Approach Delay					16.0						9.3	
Approach LOS					В						A	
Queue Length 50th (m)					9.3						29.2	10.8
Queue Length 95th (m)					11.9						47.0	22.8
Internal Link Dist (m)		117.8			157.8			120.4			277.6	
Turn Bay Length (m)												
Base Capacity (vph)					1522						970	845
Starvation Cap Reductn					0						0	0
Spillback Cap Reductn					0						0	0
Storage Cap Reductn					0						0	0
Reduced v/c Ratio					0.47						0.40	0.31
Intersection Summary												
Cycle Length: 75												
Actuated Cycle Length: 75												
Offset: 24 (32%), Reference	d to phase	2: and 6:	WBTL, S	Start of Gr	reen							
Natural Cycle: 55												
Control Type: Actuated-Cool	dinated											

Synchro 10 Light Report Page 1 
 Lanes, Volumes, Timings
 2024 Future Total

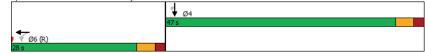
 1: HWY 417 OR/Lyon & Catherine
 05-16-2024

 Maximum v/c Ratio: 0.47
 Intersection LOS: B

 Intersection Capacity Utilization 50.1%
 ICU Level of Service A

 Analysis Period (min) 15
 ICU Level of Service A

Splits and Phases: 1: HWY 417 OR/Lyon & Catherine



30-48 Chamberlain PM PEAK HOUR

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ane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBF
ane Configurations					<b>≜</b> †}⊧	1		4412				
raffic Volume (vph)	0	0	0	0	651	317	25	742	0	0	0	
uture Volume (vph)	0	0	0	0	651	317	25	742	0	0	0	
Satd. Flow (prot)	0	0	0	0	3143	1350	0	4755	0	0	0	
It Permitted								0.998				
Satd. Flow (perm)	0	0	0	0	3143	1247	0	4752	0	0	0	
Satd. Flow (RTOR)								70				
ane Group Flow (vph)	0	0	0	0	683	285	0	767	0	0	0	
Turn Type		-		-	NA	Perm	Perm	NA	-	-	-	
Protected Phases					6			8				
Permitted Phases						6	8	Ŭ				
Detector Phase					6	6	8	8				
Switch Phase					Ŭ	Ŭ	U	U				
Vinimum Initial (s)					10.0	10.0	10.0	10.0				
Vinimum Split (s)					27.8	27.8	17.8	17.8				
Fotal Split (s)					38.0	38.0	32.0	32.0				
Total Split (%)					50.7%	50.7%	42.7%	42.7%				
fellow Time (s)					3.3	3.3	42.7 %	42.7 %				
1 /						3.3 2.5	3.3 2.5					
All-Red Time (s)					2.5 0.0	2.5	2.5	2.5 0.0				
ost Time Adjust (s)												
Fotal Lost Time (s)					5.8	5.8		5.8				
_ead/Lag					Lag	Lag						
_ead-Lag Optimize?												
Recall Mode					C-Max	C-Max	Max	Max				
Act Effct Green (s)					32.2	32.2		26.2				
Actuated g/C Ratio					0.43	0.43		0.35				
//c Ratio					0.51	0.53		0.45				
Control Delay					14.4	16.7		18.0				
Queue Delay					0.0	0.0		0.0				
Fotal Delay					14.4	16.7		18.0				
LOS					В	В		В				
Approach Delay					15.0			18.0				
Approach LOS					В			В				
Queue Length 50th (m)					30.1	25.1		27.1				
Queue Length 95th (m)					m41.5	m37.4		37.2				
nternal Link Dist (m)		157.8			130.6			43.8			56.6	
Furn Bay Length (m)												
Base Capacity (vph)					1349	535		1705				
Starvation Cap Reductn					0	0		0				
Spillback Cap Reductn					0	0		0				
Storage Cap Reductn					0	0		0				
Reduced v/c Ratio					0.51	0.53		0.45				
ntersection Summary												
Cycle Length: 75												
Actuated Cycle Length: 75												
Offset: 12 (16%), Reference	to phase	2. and 6.	WBT Sta	art of Gre	en							

Synchro 10 Light Report Page 3

Lanes, Volumes, Timings	2024 Future Total
2: Kent & Catherine	05-16-2024

Lane Group	Ø5
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	5
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	5.0
Total Split (s)	5.0
Total Split (%)	7%
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	
Recall Mode	Max
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (m)	
Queue Length 95th (m)	
Internal Link Dist (m)	
Turn Bay Length (m)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

30-48 Chamberlain PM PEAK HOUR

Lanes, Volumes, Timings 2: Kent & Catherine		2024 Future Tota 05-16-2024
Maximum v/c Ratio: 0.53		
Intersection Signal Delay: 16.4	Intersection LOS: B	
Intersection Capacity Utilization 50.6%	ICU Level of Service A	
Analysis Period (min) 15		
m Volume for 95th percentile queue is metered by	y upstream signal.	

Splits and Phases:	2: Kent & Catherine
--------------------	---------------------

●øs ◆ ∞6 (R)	< <b>↑</b> ø8
5 s 38 s	32 s

3: Chamberlain & Ke	nt							05-16
	≯	-	-		1	1		
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø4	
Lane Configurations		<b>^</b>						
Traffic Volume (vph)	0	779	0	0	0	0		
Future Volume (vph)	0	779	0	0	0	0		
Satd. Flow (prot)	0	3316	0	0	0	0		
Flt Permitted	0	0010	U	0	0	0		
Satd. Flow (perm)	0	3316	0	0	0	0		
Satd. Flow (RTOR)	0	0010	0	0	0	0		
Lane Group Flow (vph)	0	779	0	0	0	0		
Turn Type	0	NA	0	0	0	0		
Protected Phases		2					4	
Permitted Phases		2					4	
Detector Phase		2						
		2						
Switch Phase		40.0					10.0	
Minimum Initial (s)		10.0					10.0	
Minimum Split (s)		36.0					21.0	
Total Split (s)		36.0					21.0	
Total Split (%)		63.2%					37%	
Yellow Time (s)		3.3					3.0	
All-Red Time (s)		1.7					1.0	
Lost Time Adjust (s)		0.0						
Total Lost Time (s)		5.0						
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode		Min					None	
Act Effct Green (s)		34.7						
Actuated g/C Ratio		0.83						
v/c Ratio		0.28						
Control Delay		4.3						
Queue Delay		0.0						
Total Delay		4.3						
LOS		A						
Approach Delay		4.3						
Approach LOS		A						
Queue Length 50th (m)		0.0						
Queue Length 95th (m)		32.5						
Internal Link Dist (m)		270.2	176.4		23.7			
Turn Bay Length (m)		210.2	110.4		20.1			
Base Capacity (vph)		2740						
Starvation Cap Reductn		0						
Spillback Cap Reductn		0						
Storage Cap Reductin		0						
Reduced v/c Ratio		0.28						
Reduced V/C Rallo		0.20						
Intersection Summary								
Cycle Length: 57								
Actuated Cycle Length: 42								
Natural Cycle: 60								
Control Type: Semi Act-Uncoo	rd							
Maximum v/c Ratio: 0.28								

Synchro 10 Light Report Page 5

Lanes, Volumes, Timings 3: Chamberlain & Kent		2024 Future Total 05-16-2024
Intersection Signal Delay: 4.3	Intersection LOS: A	
Intersection Capacity Utilization 26.9%	ICU Level of Service A	
Analysis Period (min) 15		
Splits and Phases: 3: Chamberlain & Kent		
ø2		
36.0	21 c	

1: Bank & Catherine											05-1	
	≯	-	$\mathbf{\hat{z}}$	-	-	*	1	1	1	1	÷.	-
ane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SE
ane Configurations					4 <b>†</b> ₽			- <b>↑</b> }			<b>≜</b> 1≽	
raffic Volume (vph)	0	0	0	257	553	157	203	340	0	0	643	12
uture Volume (vph)	0	0	0	257	553	157	203	340	0	0	643	12
Satd. Flow (prot)	0	0	0	0	4536	0	0	3256	0	0	3077	
It Permitted					0.987			0.544				
Satd. Flow (perm)	0	0	0	0	4474	0	0	1765	0	0	3077	
Satd. Flow (RTOR)					51						29	
ane Group Flow (vph)	0	0	0	0	967	0	0	543	0	0	763	
urn Type				Perm	NA		pm+pt	NA			NA	
Protected Phases					8		5	2			6	
Permitted Phases				8			2					
etector Phase				8	8		5	2			6	
witch Phase												
/inimum Initial (s)				10.0	10.0		5.0	10.0			10.0	
/inimum Split (s)				23.6	23.6		10.4	21.4			21.4	
otal Split (s)				24.0	24.0		14.0	41.0			27.0	
otal Split (%)				32.0%	32.0%		18.7%	54.7%			36.0%	
(ellow Time (s)				3.3	3.3		3.3	3.3			3.3	
II-Red Time (s)				2.3	2.3		2.1	2.1			2.1	
ost Time Adjust (s)					0.0			0.0			0.0	
otal Lost Time (s)					5.6			5.4			5.4	
ead/Lag				Lag	Lag						Lag	
ead-Lag Optimize?				J	Ŭ						Yes	
Recall Mode				Max	Max		Max	C-Max			C-Max	
ct Effct Green (s)					18.4			35.6			21.6	
ctuated g/C Ratio					0.25			0.47			0.29	
/c Ratio					0.85			0.54			0.84	
Control Delay					34.4			12.2			34.5	
Queue Delay					0.0			0.0			2.9	
otal Delay					34.4			12.2			37.4	
OS					С			В			D	
pproach Delay					34.4			12.2			37.4	
pproach LOS					С			В			D	
ueue Length 50th (m)					45.4			15.2			51.2	
ueue Length 95th (m)					#66.1			19.2			#80.1	
nternal Link Dist (m)		130.6			383.3			80.8			138.4	
urn Bay Length (m)												
Base Capacity (vph)					1136			1008			906	
Starvation Cap Reductn					0			0			0	
pillback Cap Reductn					1			0			71	
storage Cap Reductn					0			0			0	
Reduced v/c Ratio					0.85			0.54			0.91	
ntersection Summary												
ycle Length: 75												
ctuated Cycle Length: 75												
Offset: 50 (67%), Reference	d to phase	2:NBTL a	and 6:SE	T, Start o	of Green							
latural Cycle: 70												
ontrol Type: Actuated-Cool	rdinated											

Synchro 10 Light Report Page 7

Lanes, Volumes, Timings	
4: Bank & Catherine	

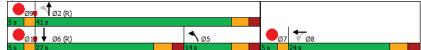
2024 Future Total 05-16-2024

Lane Group	Ø7	Ø9	Ø13
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Satd. Flow (RTOR)			
Lane Group Flow (vph)			
Turn Type	-	0	40
Protected Phases	7	9	13
Permitted Phases			
Detector Phase			
Switch Phase			
Minimum Initial (s)	1.0	1.0	1.0
Minimum Split (s)	5.0	5.0	5.0
Total Split (s)	5.0	5.0	5.0
Total Split (%)	7%	7%	7%
Yellow Time (s)	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0
Lost Time Adjust (s)			2.0
Total Lost Time (s)			
Lead/Lag	Lead		Lead
Lead-Lag Optimize?	Loud		Yes
Recall Mode	Max	Max	Max
Act Effct Green (s)	IVIAX	IVIAX	IVIdX
Actuated g/C Ratio			
v/c Ratio		_	
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (m)			
Queue Length 95th (m)			
Internal Link Dist (m)			
Turn Bay Length (m)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductin			
Reduced v/c Ratio			_
Reduced V/C Ratio			
Intersection Summary			
interessed on Sammary			

Lanes, Volumes, Timings 4: Bank & Catherine		2024 Future Total 05-16-2024
Maximum v/c Ratio: 0.85		
Intersection Signal Delay: 30.1	Intersection LOS: C	
Intersection Capacity Utilization 76.9%	ICU Level of Service D	
Analysis Period (min) 15		
# OF the second state of the second second state of the second	and the leases	

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

Splits and Phases: 4: Bank & Catherine



30-48 Chamberlain PM PEAK HOUR

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30-48 Chamberlain PM PEAK HOUR

	۶	-	$\mathbf{F}$	4	-	*	•	1	1	1	÷.	4
ane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBF
ane Configurations		-{†	1					At≯			- <b>↑</b> }	
raffic Volume (vph)	57	592	121	0	0	0	0	476	91	175	720	
uture Volume (vph)	57	592	121	0	0	0	0	476	91	175	720	
Satd. Flow (prot)	0	3302	1483	0	0	0	0	3106	0	0	3283	
It Permitted		0.996									0.714	
Satd. Flow (perm)	0	3299	1345	0	0	0	0	3106	0	0	2323	
Satd. Flow (RTOR)			134					31				
ane Group Flow (vph)	0	649	121	0	0	0	0	567	0	0	895	
urn Type	Perm	NA	Perm					NA		pm+pt	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4							6		
Detector Phase	4	4	4					2		1	6	
Switch Phase												
/linimum Initial (s)	10.0	10.0	10.0					10.0		5.0	10.0	
/linimum Split (s)	26.2	26.2	26.2					23.1		11.1	23.1	
otal Split (s)	31.0	31.0	31.0					30.0		14.0	44.0	
otal Split (%)	41.3%	41.3%	41.3%					40.0%		18.7%	58.7%	
'ellow Time (s)	3.3	3.3	3.3					3.0		3.0	3.0	
All-Red Time (s)	2.9	2.9	2.9					3.1		3.1	3.1	
ost Time Adjust (s)		0.0	0.0					0.0			0.0	
otal Lost Time (s)		6.2	6.2					6.1			6.1	
.ead/Lag								Lead		Lag		
ead-Lag Optimize?								Yes		Yes		
Recall Mode	None	None	None					C-Max		None	C-Max	
ct Effct Green (s)		20.6	20.6					42.1			42.1	
ctuated g/C Ratio		0.27	0.27					0.56			0.56	
/c Ratio		0.72	0.26					0.32			0.69	
Control Delay		29.1	4.7					9.5			13.3	
Queue Delay		0.0	0.0					0.0			3.0	
otal Delay		29.1	4.7					9.5			16.3	
.OS		С	A					A			В	
pproach Delay		25.3						9.5			16.3	
pproach LOS		С						A			В	
Queue Length 50th (m)		43.5	0.0					19.3			71.3	
Queue Length 95th (m)		55.7	8.7					32.7			m88.0	
nternal Link Dist (m)		176.4			219.4			129.7			80.8	
urn Bay Length (m)			30.0					1750			1005	
Base Capacity (vph)		1090	534					1758			1305	
Starvation Cap Reductn		0	0					0			297	
Spillback Cap Reductn		0	0					0			0	
Storage Cap Reductn		0	0					0			0	
Reduced v/c Ratio		0.60	0.23					0.32			0.89	
ntersection Summary												
Cycle Length: 75												
Actuated Cycle Length: 75			nd 6:SBTI									

Synchro 10 Light Report Page 11

Lanes, Volumes, Timings 5: Bank & Chamberlain/Isabella		2024 Future Total 05-16-2024
Maximum v/c Ratio: 0.72	1.1	

Intersection Signal Delay: 17.7	Intersection LOS: B	
Intersection Capacity Utilization 82.2%	ICU Level of Service E	
Analysis Period (min) 15		

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

Splits and Phases: 5: Bank & Chamberlain/Isabella

Ø2 (R)	Ø1	Ø4	
30 s	14 s	31s	
Ø6 (R)			
44 s			

30-48 Chamberlain PM PEAK HOUR



2029 Future Total Conditions

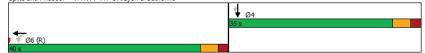


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ane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SB
ane Configurations					4412						•	ĩ
Traffic Volume (vph)	0	0	0	226	220	0	0	0	0	0	258	13
Future Volume (vph)	0	0	0	226	220	0	0	0	0	0	258	13
Satd. Flow (prot)	0	0	0	0	4645	0	0	0	0	0	1745	148
It Permitted					0.975							
Satd. Flow (perm)	0	0	0	0	4611	0	0	0	0	0	1745	145
Satd. Flow (RTOR)					226							13
ane Group Flow (vph)	0	0	0	0	446	0	0	0	0	0	258	13
Furn Type				Perm	NA						NA	Perr
Protected Phases					6						4	
Permitted Phases				6								
Detector Phase				6	6						4	
Switch Phase												
Minimum Initial (s)				10.0	10.0						10.0	10.
Vinimum Split (s)				26.2	26.2						28.3	28.
Total Split (s)				40.0	40.0						35.0	35.
Total Split (%)				53.3%	53.3%						46.7%	46.7%
fellow Time (s)				3.3	3.3						3.3	3.
All-Red Time (s)				1.9	1.9						2.0	2.
ost Time Adjust (s)					0.0						0.0	0.
otal Lost Time (s)					5.2						5.3	5.
_ead/Lag												
ead-Lag Optimize?												
Recall Mode				C-Max	C-Max						Max	Ма
Act Effct Green (s)					34.8						29.7	29.
Actuated g/C Ratio					0.46						0.40	0.4
//c Ratio					0.20						0.37	0.2
Control Delay					10.5						18.1	3.
Queue Delay					0.0						0.0	0.
Total Delay					10.5						18.1	3.
.0S					В						В	
Approach Delay					10.5						13.3	
Approach LOS					В						В	
Queue Length 50th (m)					17.3						25.1	0.
Queue Length 95th (m)					26.4						42.7	9.
nternal Link Dist (m)		117.8			157.8			120.4			277.6	
furn Bay Length (m)												
Base Capacity (vph)					2260						691	65
Starvation Cap Reductn					0						0	
Spillback Cap Reductn					0						0	
Storage Cap Reductn					0						0	
Reduced v/c Ratio					0.20						0.37	0.2
ntersection Summary												
Cycle Length: 75												
Actuated Cycle Length: 75												
Offset: 48 (64%), Reference	d to phase	2: and 6:	WBTI S	Start of G	een							

Synchro 10 Light Report Page 1

Lanes, Volumes, Timings 1: HWY 417 OR/Lyon & Catherine		2029 Future Total 05-16-2024
Maximum v/c Ratio: 0.37		
Intersection Signal Delay: 11.8	Intersection LOS: B	
Intersection Capacity Utilization 47.8%	ICU Level of Service A	
Analysis Period (min) 15		

Splits and Phases: 1: HWY 417 OR/Lyon & Catherine



30-48 Chamberlain AM Peak Hour

Lane Configurations       I <thi< th=""></thi<>		≯	-	$\mathbf{r}$	1	-	•	-	1	1	1	÷.	4
Traffic Volume (vph) 0 0 0 0 394 539 54 1408 0 0 0 0 Future Volume (vph) 0 0 0 0 394 539 54 1408 0 0 0 Future Volume (vph) 0 0 0 0 2917 1350 0 4755 0 0 0 0 TI Permitted 304 Flow (perm) 0 0 0 0 2917 1262 0 4750 0 0 0 Satd. Flow (PTOR) 70 0 0 0 642 291 0 1462 0 0 0 0 Satd. Flow (Pth) 0 0 0 642 291 0 1462 0 0 0 0 Future Type NA Perm Perm NA Protected Phases 6 6 8 Selector Phase 6 6 8 Subth Phase 7 8 77.8 17.8 17.8 17.8 Total Split (s) 10.0 10.0 10.0 10.0 Winimum Initia (s) 10.0 10.0 10.0 10.0 Satd Split (s) 27.8 27.8 17.8 17.8 Total Split (s) 32.0 38.0 38.0 Total Split (s) 25.2 5.2 5 Lost Time (s) 2.5 2.5 2.5 Lost Time (s) 2.5 2.5 2.5 Lost Time (s) 2.5 2.5 2.5 Lost Time (s) 2.5 2.5 2.5 Satd Flow (proteen (s) 2.6 2.2 32.2 Schall Adde C-Max Max Max Lefferd Green (s) 2.6 2.2 32.2 Schall Adde 2.6 2 32.2 Schall Split (s) 7.5 Struct Delay 1.4 3.9 6 66.7 Subth Struct 1.5 3 Subth Struct 1.5 5 Subth Struct 2.5 5 Subth Struct 2.5 5 Subth Struct 1.5 5 Subth Struct 2.5 5 Subth S	ane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBI
Iraffic Volume (vph) 0 0 0 0 0 394 539 54 1408 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	ane Configurations					<b>≜</b> †}	1		4412				
Said. Flow (prot)       0       0       0       2917       1350       0       4755       0       0       0         It Permitted       0.938       70       0       0       0       2917       1262       0       4755       0       0       0       0         Said. Flow (porm)       0       0       0       2917       1262       0       1462       0       0       0         Said. Flow (port)       0       0       0       6       8       2       0       1462       0	raffic Volume (vph)	0	0	0	0		539	54		0	0	0	
it Permitted       0       0       0       2917       1262       0       4750       0       0       0         and Group Flow (vph)       0       0       0       642       291       0       1462       0       0       0       0         ane Group Flow (vph)       0       0       0       642       291       0       1462       0       0       0         um Type       NA       Perm       Perm       NA       <	uture Volume (vph)	0	0	0	0	394	539	54	1408	0	0	0	
Said. Flow (prm)       0       0       0       2917       1262       0       4750       0       0       0         said. Flow (RTOR)       70 <td>Satd. Flow (prot)</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>2917</td> <td>1350</td> <td>0</td> <td>4755</td> <td>0</td> <td>0</td> <td>0</td> <td></td>	Satd. Flow (prot)	0	0	0	0	2917	1350	0	4755	0	0	0	
Said. Flow (RTOR)       70         ane Group Flow (vph)       0       0       0       642       291       0       1462       0       0         Protected Phases       6       8       8       8       8       8       8         Protected Phases       6       8 <t< td=""><td>Flt Permitted</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>	Flt Permitted												
ane Group Flow (vph)       0       0       0       642       291       0       1462       0       0       0         fum Type       NA       Perm       Perm       NA       Perm       NA         Parmited Phases       6       8       8       8       9       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10 <t< td=""><td>Satd. Flow (perm)</td><td>0</td><td>0</td><td>0</td><td>0</td><td>2917</td><td>1262</td><td>0</td><td>4750</td><td>0</td><td>0</td><td>0</td><td></td></t<>	Satd. Flow (perm)	0	0	0	0	2917	1262	0	4750	0	0	0	
autor Type       NA       Perm       NA       Perm       NA         Protected Phases       6       8       8         Permitted Phases       6       8       8         Partited Phases       6       6       8         Partited Phases       6       6       8         Switch Phase       6       6       8         Winimum Split (s)       10.0       10.0       10.0         Minimum Split (s)       27.8       27.8       17.8       17.8         Total Split (s)       32.0       32.0       38.0       38.0         Foldal Split (s)       2.5       2.5       2.5       2.5       2.5         Lost Time (s)       3.3       3.3       3.3       3.3       3.3         VI-Red Time (s)       2.5       2.5       2.5       2.5       2.5         Lost Time (s)       5.8       5.8       5.8       5.8       5.8         exael Mode       C-Max       C-Max       Max       Max         Vec Real Mode       C-Max       Max       Max       Max         Vec Real Mode       C-Max       Max       Max       Max         Vec Real Mode       C-Max	Satd. Flow (RTOR)												
Bernetized Phases         6         8           Permitted Phases         6         8           Detector Phase         6         8           Winimum Initial (s)         10.0         10.0         10.0           Vinimum Split (s)         27.8         27.8         17.8           Otal Split (s)         32.0         32.0         38.0           Total Split (s)         32.0         32.0         38.0           Total Split (s)         22.5         2.5         2.5           Lag         Lag         Lag         Lag           Ledd Lag         Lag         Lag         Lag           ead/Lag         Lag         Lag         Lag      <	ane Group Flow (vph)	0	0	0	0	642	291	0	1462	0	0	0	
Fermitted Phases         6         8           Detector Phase         6         6         8           Witch Phase         10.0         10.0         10.0         10.0           Minimum Split (s)         27.8         27.8         17.8         17.8           Total Split (s)         32.0         38.0         38.0         38.0           Total Split (s)         32.0         2.5         2.6         2.2         2.6 <td>Turn Type</td> <td></td> <td></td> <td></td> <td></td> <td>NA</td> <td>Perm</td> <td>Perm</td> <td>NA</td> <td></td> <td></td> <td></td> <td></td>	Turn Type					NA	Perm	Perm	NA				
Detector Phase         6         6         8         8           Switch Phase         00         10.0         10.0         10.0           Minimum Split (s)         27.8         27.8         17.8         17.8           Total Split (s)         32.0         32.0         38.0         38.0           Total Split (s)         42.7%         42.7%         50.7%         50.7%           Fold Split (s)         32.0         33.0         3.3         3.3         3.3           NI-Red Time (s)         2.5         2.6         2.32.2          2.6         2.32.2          2.6         2.32.2          2.6         2.0         3.2         2.6	Protected Phases					6			8				
Switch Phase       10.0       10.0       10.0       10.0         Minimum Initial (s)       10.0       10.0       10.0       10.0         Viinimum Split (s)       27.8       27.8       17.8       17.8         Total Split (s)       32.0       32.0       38.0       38.0         Total Split (s)       42.7%       42.7%       50.7%       50.7%         Folda Split (s)       2.5       2.5       2.5       2.5         Soat Time Adjust (s)       0.0       0.0       0.0         Total Lost Time (s)       5.8       5.8       5.8         cad-Lag Optimize?       26.2       22.2       22.2         Recall Mode       C-Max       C-Max       Max         Act Effic Green (s)       26.2       26.2       32.2         Actuated g/C Ratio       0.35       0.35       0.43         /c Ratio       0.66       0.70       20         Control Delay       26.1       29.9       18.8         Queue Delay       0.0       0.0       0.0         Cold Lost Miney       27.3       18.8       20         Queue Length SOth (m)       43.1       39.6       56.7         Queue Length 95th (m)	Permitted Phases						6	8					
Winimum Initial (s)       10.0       10.0       10.0       10.0         Minimum Split (s)       27.8       27.8       17.8       17.8         Fotal Split (s)       32.0       38.0       38.0       38.0         Fotal Split (s)       42.7%       42.7%       50.7%       50.7%         Cellow Time (s)       3.3       3.3       3.3       3.3       3.3         Jal-Red Time (s)       2.5       2.5       2.5       2.5       2.5         cost Time Adjust (s)       0.0       0.0       0.0       0.0         Total Lost Time (s)       5.8       5.8       5.8       5.8         cead-Lag Optimize?       Recall Mode       C-Max       Max       Max         Act Effct Green (s)       2.6.2       2.2.2       32.2       32.2       32.2         Actaded g/C Ratio       0.35       0.35       0.43       32.0       32.0       32.0       32.0       32.0       32.0       32.0       32.0       32.2<	Detector Phase					6	6	8	8				
Inimum Split (s)       27.8       27.8       17.8       17.8         Total Split (s)       32.0       32.0       38.0       38.0         Folal Split (%)       42.7%       42.7%       50.7%       50.7%         Folal Split (%)       42.7%       42.7%       50.7%       50.7%         Folal Split (%)       42.7%       42.7%       50.7%       50.7%         Folal Split (%)       2.5       2.5       2.5       2.5       2.5         Lag Lag       Lag <td>Switch Phase</td> <td></td>	Switch Phase												
Total Split (s)       32.0       38.0       38.0         Total Split (s)       42.7%       42.7%       50.7%       50.7%         Follow Time (s)       3.3       3.3       3.3       3.3       3.3         All-Red Time (s)       2.5       2.5       2.5       2.5       2.5         Lost Time (s)       5.8       5.8       5.8       5.8         ead/Lag       Lag       Lag       Lag       Lag         e.ad/Lag Optimize?       2.6       2.6       3.2.2       Actuated G/C Ratio       0.35       0.43         Act Effct Green (s)       2.6.2       2.6.2       3.2.2       Actuated g/C Ratio       0.66       0.70         Control Delay       2.6.1       2.9.9       18.8       2.00       0.0       0.0         Cotard Delay       2.6.1       2.9.9       18.8       2.02       Actuated g/C Ratio       0.0       0.0       0.0         Total Delay       2.6.1       2.9.9       18.8       2.02       Actuated g/C Ratio       0.0       0.0       0.0         Outer Delay       2.7.3       18.8       2.02       2.02       Actuated g/C Ratio       0.0       0.0       0.0       0.0       0.0       0.0 <t< td=""><td>Vinimum Initial (s)</td><td></td><td></td><td></td><td></td><td>10.0</td><td>10.0</td><td>10.0</td><td>10.0</td><td></td><td></td><td></td><td></td></t<>	Vinimum Initial (s)					10.0	10.0	10.0	10.0				
Total Split (%)       42.7%       42.7%       50.7%       50.7%         Vellow Time (s)       3.3       3.3       3.3       3.3       3.3         NIR-Red Time (s)       2.5       2.5       2.5       2.5       2.5         cost Time Adjust (s)       0.0       0.0       0.0         Total Lost Time (s)       5.8       5.8       5.8         cad-Lag       Lag       Lag       Lag         ead-Lag Optimize?       26.2       26.2       32.2         Actated g/C Ratio       0.35       0.35       0.43         /c Ratio       0.66       0.70       20.1         Control Delay       26.1       29.9       18.8         Queue Delay       0.0       0.0       0.0         Cottal Delay       26.1       29.9       18.8         Queue Length SOth (m)       43.1       39.6       56.7         Queue Length SOth (m)       m60.7       m60.7       32.3         Approach DS       C       B       20.2         Queue Length SOth (m)       131.9.6       56.7       32.2         Queue Length SOth (m)       157.8       130.6       47.0       56.6         Turn Bay Length (m)       <	Vinimum Split (s)					27.8	27.8	17.8	17.8				
fellow Time (s)       3.3       3.3       3.3       3.3       3.3         NI-Red Time (s)       2.5       2.5       2.5       2.5         Lost Time Adjust (s)       0.0       0.0       0.0         Otal Lost Time (s)       5.8       5.8       5.8         .ead-Lag Optimize?       Recall Mode       C-Max       C-Max       Max         Act Effct Green (s)       2.6.2       2.2.2       2.2         Actual dy (C Ratio       0.35       0.35       0.43         //c Ratio       0.6.3       0.66       0.70         Ontrol Delay       2.6.1       29.9       18.8         Dueue Delay       0.0       0.0       0.0         OS       C       C       B         Approach Delay       27.3       18.8         Queue Length 50th (m)       43.1       39.6       56.7         Queue Length 50th (m)       157.8       130.6       47.0       56.6         Tum Bay Length (m)       1019       440       2079       Saec Capacity (vph)       56.6         Starvation Cap Reductn       0       0       0       0       56.6         Current Link Dist (m)       157.8       130.6       0.70	Total Split (s)					32.0	32.0	38.0	38.0				
NII-Red Time (s)       2.5       2.5       2.5       2.5         cost Time Adjust (s)       0.0       0.0       0.0         Total Lost Time (s)       5.8       5.8       5.8         cead/Lag       Lag       Lag       cag         cead/Lag       Lag       Lag       cag         cead/Lag       Lag       Lag       cag         cead/Lag       C-Max       C-Max       Max         vct Effct Green (s)       2.6.2       3.2.2         Actuated g/C Ratio       0.35       0.35       0.43         //c Ratio       0.63       0.66       0.70         Control Delay       2.6.1       29.9       18.8         Queue Delay       0.0       0.0       0.0         Total Delay       26.1       29.9       18.8         Qoproach LOS       C       B       Approach LOS       C         Queue Length 50th (m)       43.1       39.6       56.7       2.0         Queue Length 95th (m)       157.8       130.6       47.0       56.6         Turm Bay Length 0m       0       0       0       0         Savardion Cap Reductn       0       0       0       0      <	Total Split (%)					42.7%	42.7%	50.7%	50.7%				
cost Time Adjust (s)         0.0         0.0         0.0           Total Lost Time (s)         5.8         5.8         5.8           cead/Lag         Lag         Lag         Lag           cead-Lag Optimize?         Recall Mode         C-Max         C-Max         Max           Act Effic Green (s)         26.2         26.2         32.2           Actuated g/C Ratio         0.63         0.66         0.70           Control Delay         26.1         29.9         18.8           Queue Delay         0.0         0.0         0.0           Cotal Delay         26.1         29.9         18.8           Queue Delay         0.0         0.0         0.0         0.0           OS         C         C         B         Approach Delay         27.3         18.8           Queue Length SOth (m)         43.1         39.6         56.7         20.2         20.3           Queue Length SOth (m)         157.8         130.6         47.0         56.6         56.6           Furm Bay Length (m)         30.6         0.70         56.6         6         6.70         56.6         6         6         6.70         56.6         6         6         6.6	fellow Time (s)					3.3	3.3	3.3	3.3				
Total Lost Time (s)       5.8       5.8       5.8         cead/Lag       Lag       Lag       Lag         cead/Lag Optimize?       Recall Mode       C-Max       C-Max       Max         Act Effct Green (s)       26.2       26.2       32.2         Actad and and and and and and and and and a	All-Red Time (s)					2.5	2.5	2.5	2.5				
Lag         Lag         Lag           e.ad-Lag Optimize?	ost Time Adjust (s)					0.0	0.0		0.0				
Lead-Lag Optimize?         View           Secall Mode         C-Max         C-Max         Max         Max           Act Effct Green (s)         26.2         26.2         32.2         Actautated g/C Ratio         0.35         0.43           v/c Ratio         0.63         0.66         0.70         Octave         O	Total Lost Time (s)					5.8	5.8		5.8				
Recall Mode         C-Max         C-Max         Max         Max           Act Eff Green (s)         26.2         26.2         32.2           Actuated g/C Ratio         0.35         0.43           /c Ratio         0.63         0.66         0.70           Control Delay         26.1         29.9         18.8           Queue Delay         0.0         0.0         0.0           Total Delay         26.1         29.9         18.8           OS         C         C         B           Approach Delay         27.3         18.8           Oueue Length SOth (m)         43.1         39.6         56.7           Queue Length SOth (m)         157.8         130.6         47.0         56.6           Turm Bay Length (m)         38.6         47.0         56.6         56.7           Starvation Cap Reductn         0         0         0         66.6           Starvation Cap Reductn         0         0         0         56.6           Starvation Cap Reductn         0         0         0         0         56.6           Starvation Cap Reductn         0         0         0         0         56.6           Starvation Cap Redu	_ead/Lag					Lag	Lag						
Act Effct Green (s)         26.2         26.2         32.2           Actuated g/C Ratio         0.35         0.35         0.43           //c Ratio         0.63         0.66         0.70           Control Delay         26.1         29.9         18.8           Dueue Delay         0.0         0.0         0.0           Total Delay         26.1         29.9         18.8           Queue Delay         0.0         0.0         0.0           Total Delay         26.1         29.9         18.8           Queue Delay         0.0         0.0         0.0           OS         C         C         B           Approach Delay         27.3         18.8           Queue Length S0th (m)         43.1         39.6         56.7           Queue Length 95th (m)         m60.7         m56.7         72.3           Item Bay Length (m)         30.6         47.0         56.6           Turm Bay Length (m)         30.6         47.0         56.6           Starvation Cap Reductn         0         0         0           SpliBack Cap Reductn         0         0         0           Storage Cap Reductn         0         0         0	_ead-Lag Optimize?												
Actuated g/C Ratio         0.35         0.43           //c Ratio         0.63         0.66         0.70           Control Delay         26.1         29.9         18.8           Queue Delay         0.0         0.0         0.0           Total Delay         26.1         29.9         18.8           Queue Delay         0.0         0.0         0.0           Total Delay         26.1         29.9         18.8           LOS         C         C         B           Approach LOS         C         B         Delay           Queue Length Sth (m)         43.1         39.6         56.7           Queue Length Sth (m)         157.8         130.6         47.0         56.6           Turm Bay Length (m)         38ase Capacity (vph)         1019         440         2079           Starvation Cap Reductn         0         0         0         0           Spliback Cap Reductn         0         0         0         0           Starvation Cap Reductn         0         0         0         0           Starvation Cap Reductn         0         0         0         0         0           Stavation Cap Reductn         0	Recall Mode					C-Max	C-Max	Max	Max				
//c Ratio       0.63       0.66       0.70         Control Delay       26.1       29.9       18.8         Dueue Delay       0.0       0.0       0.0         Total Delay       26.1       29.9       18.8         LOS       C       C       B         Approach Delay       27.3       18.8         Approach Delay       27.3       18.8         Queue Length S0th (m)       43.1       39.6       56.7         Queue Length 95th (m)       m60.7       m56.7       72.3         Internal Link Dist (m)       157.8       130.6       47.0       56.6         Turn Bay Length (m)       38e Capacity (vph)       1019       440       2079         Starvation Cap Reductn       0       0       0       Storage Cap Reductn       0       0         Storage Cap Reductn       0       0       0       O       Storage Cap Reductn       0       0       Reduced vic Ratio       0.63       0.66       0.70         Intersection Summary       Cycle Length: 75       75       55       55       55       55	Act Effct Green (s)					26.2	26.2		32.2				
Control Delay         26.1         29.9         18.8           Queue Delay         0.0         0.0         0.0           Total Delay         26.1         29.9         18.8           OS         C         C         B           Approach Delay         27.3         18.8           Approach Delay         27.3         18.8           Approach Delay         27.3         18.8           Approach DCS         C         B           Queue Length 50th (m)         43.1         39.6         56.7           Queue Length 95th (m)         m60.7         m56.7         72.3           Iteme Link Dist (m)         157.8         130.6         47.0         56.6           Turm Bay Length (m)         38.6         20.79         58.7         38.6         38.6         39.6         56.7           Save Capacity (vph)         1019         440         2079         56.6         56.6         56.6         56.6         56.6         56.7         56.6         56.7         56.6         56.7         56.6         56.7         56.6         56.7         56.6         56.7         56.6         56.7         56.6         56.7         56.6         56.7         56.6 <td< td=""><td>Actuated g/C Ratio</td><td></td><td></td><td></td><td></td><td>0.35</td><td>0.35</td><td></td><td>0.43</td><td></td><td></td><td></td><td></td></td<>	Actuated g/C Ratio					0.35	0.35		0.43				
Queue Delaý         0.0         0.0         0.0           Total Delay         26.1         29.9         18.8           LOS         C         C         B           Approach Delay         27.3         18.8           Approach LOS         C         B           Queue Length S0th (m)         43.1         39.6         56.7           Queue Length 95th (m)         m60.7         m56.7         72.3           Itemal Link Dist (m)         157.8         130.6         47.0         56.6           Turm Bay Length (m)         38ec Capacity (vph)         1019         440         2079           Starvation Cap Reductn         0         0         0         50           Sprülback Cap Reductn         0         0         0         58           Reduced vic Ratio         0.63         0.66         0.70         72           Intersection Summary         C         C         9         72         72	//c Ratio					0.63	0.66		0.70				
Total Delay         26.1         29.9         18.8           .OS         C         C         B           Approach Delay         27.3         18.8           Approach Delay         27.3         18.8           Approach Delay         27.3         18.8           Approach Delay         27.3         18.8           Approach LOS         C         B           Queue Length 50th (m)         43.1         39.6         56.7           Queue Length 95th (m)         m60.7         m56.7         72.3           ntemal Link Dist (m)         157.8         130.6         47.0         56.6           Tum Bay Length (m)         1019         440         2079         51arvation Cap Reductn         0         0         0         50           Starvation Cap Reductn         0	Control Delay					26.1	29.9		18.8				
Cols         C         C         B           Approach Delay         27.3         18.8           Approach LOS         C         B           Dueue Length 50th (m)         43.1         39.6         56.7           Dueue Length 95th (m)         m60.7         m56.7         72.3           nternal Link Dist (m)         157.8         130.6         47.0         56.6           Tum Bay Length (m)         38e Capacity (vph)         1019         440         2079           Starvation Cap Reductn         0         0         0         500           Storage Cap Reductn         0         0         0         30.6         47.0         54.6           Storage Cap Reductn         0         0         0         0         500         30.6         0.70         30.6         30.6         0.70         30.6         30.6         30.70         30.6         30.6         30.70         30.6         30.70	Queue Delay					0.0	0.0		0.0				
Approach Delay         27.3         18.8           Approach LOS         C         B           Queue Length 50th (m)         43.1         39.6         56.7           Queue Length 50th (m)         m60.7         m56.7         72.3           nternal Link Dist (m)         157.8         130.6         47.0         56.6           Turn Bay Length (m)         3ase Capacity (vph)         1019         440         2079           Starvation Cap Reductn         0         0         0         50           Sprilback Cap Reductn         0         0         0         56.6           Storage Cap Reductn         0         0         0         56.6           Storage Cap Reductn         0         0         0         0         56.6           Storage Cap Reductn         0         0         0         0         56.6         56.6         56.6         56.6         56.6         56.6         56.6         56.7         56.6         56.6         56.6         56.6         56.6         56.7         56.6         56.6         56.6         56.7         56.6         56.7         56.6         56.6         56.7         56.6         56.6         56.7         56.6         56.6	Total Delay					26.1	29.9		18.8				
Approach LOS         C         B           Dueue Length 50th (m)         43.1         39.6         56.7           Dueue Length 95th (m)         m60.7         m56.7         72.3           Internal Link Dist (m)         157.8         130.6         47.0         56.6           Turn Bay Length (m)         3ase Capacity (vph)         1019         440         2079           Starvation Cap Reductn         0         0         0         50           Spillback Cap Reductn         0         0         0         0           Storage Cap Reductn         0         0         0         0           Reduced v/c Ratio         0.63         0.66         0.70            Thresection Summary         Cycle Length: 75	_OS					С	С		В				
Augueue Length 50th (m)         43.1         39.6         56.7           Queue Length 95th (m)         m60.7         m56.7         72.3           nternal Link Dist (m)         157.8         130.6         47.0         56.6           Tum Bay Length (m)         157.8         130.6         47.0         56.6           Starvation Cap Reductn         0         0         0         50           Spillback Cap Reductn         0         0         0         0           Storage Cap Reductn         0         0         0         0           Reduced v/c Ratio         0.63         0.66         0.70         10           Storge Cap Reductn         0         0         0         0         0           Cycle Length: 75         75         5         5         5         5	Approach Delay					27.3			18.8				
Dueue Length 95th (m)         m60.7         m56.7         72.3           nternal Link Dist (m)         157.8         130.6         47.0         56.6           Furm Bay Length (m)         3ase Capacity (yph)         1019         440         2079           Starvation Cap Reductn         0         0         0         50           Spillback Cap Reductn         0         0         0         50           Storage Cap Reductn         0         0         0         50           Reduced v/c Ratio         0.63         0.66         0.70         50           Thersection Summary         2ycle Length: 75         50         50         50	Approach LOS					С			В				
Itemal Link Dist (m)         157.8         130.6         47.0         56.6           furm Bay Length (m)         3ase Capacity (vph)         1019         440         2079           starvation Cap Reductn         0         0         0         0           Spillback Cap Reductn         0         0         0         0           Storage Cap Reductn         0         0         0         0           Storage Cap Reductn         0         0         0         0           seduced vic Ratio         0.63         0.66         0.70         0           resection Summary         Discrete Start         Discrete Start         0         0         0	Queue Length 50th (m)					43.1	39.6		56.7				
Turn Bay Length (m)           Jase Capacity (vph)         1019         440         2079           Starvation Cap Reductn         0         0         0           Spillback Cap Reductn         0         0         0           Storage Cap Reductn         0         0         0           Reduced v/c Ratio         0.63         0.66         0.70           Intersection Summary         Cycle Length: 75         75	Queue Length 95th (m)					m60.7	m56.7		72.3				
Base Capacity (vph)         1019         440         2079           Starvation Cap Reductn         0         0         0           Spillback Cap Reductn         0         0         0           Storage Cap Reductn         0         0         0           Reduced v/c Ratio         0.63         0.66         0.70           Intersection Summary         2000         2000         2000	nternal Link Dist (m)		157.8			130.6			47.0			56.6	
Base Capacity (vph)         1019         440         2079           Starvation Cap Reductn         0         0         0           Spillback Cap Reductn         0         0         0           Storage Cap Reductn         0         0         0           Reduced v/c Ratio         0.63         0.66         0.70           Intersection Summary         2000         2000         2000	Furn Bay Length (m)												
Spillback Cap Reductn         0         0         0           Storage Cap Reductn         0         0         0           Reduced v/c Ratio         0.63         0.66         0.70           Intersection Summary         Description         Description         Description						1019	440		2079				
Spillback Cap Reductn         0         0         0           Storage Cap Reductn         0         0         0           Reduced v/c Ratio         0.63         0.66         0.70           Intersection Summary         Description         Description         Description						0	0		0				
Reduced V/c Ratio         0.63         0.66         0.70           Intersection Summary						0	0		0				
Reduced v/c Ratio         0.63         0.66         0.70           Intersection Summary	Storage Cap Reductn					0	0		0				
Cycle Length: 75						0.63	0.66		0.70				
Actuated Cycle Length: 75 Dffset: 15 (20%), Referenced to phase 2: and 6:WBT, Start of Green	Actuated Cycle Length: 75												

Synchro 10 Light Report Page 3

Lanes, Volumes, Timings	
2: Kent & Catherine	05-16-2024

Lane Group	Ø5		 
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Satd. Flow (RTOR)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	5		
Permitted Phases			
Detector Phase			
Switch Phase			
Minimum Initial (s)	1.0		
Minimum Split (s)	5.0		
Total Split (s)	5.0		
Total Split (%)	7%		
Yellow Time (s)	2.0		
All-Red Time (s)	0.0		
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lead		
Lead-Lag Optimize?			
Recall Mode	Max		
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (m)			
Queue Length 95th (m)			
Internal Link Dist (m)			
Turn Bay Length (m)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

30-48 Chamberlain AM Peak Hour

Maximum v/c Ratio: 0.70		
Intersection Signal Delay: 22.1	Intersection LOS: C	
Intersection Capacity Utilization 66.4%	ICU Level of Service C	
Analysis Period (min) 15		
Analysis Period (min) 15 m Volume for 95th percentile queue is metered by	upstream signal.	

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	≯	-	-		1	1		
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø4	
Lane Configurations	202	<b>^</b>			002	0.0.1	~ .	
Traffic Volume (vph)	0	814	0	0	0	0		
Future Volume (vph)	0	814	0	0	0	0		
Satd. Flow (prot)	0	3316	Ů	0	0	0		
Flt Permitted	Ŭ	0010	Ŭ	Ŭ		Ŭ		
Satd. Flow (perm)	0	3316	0	0	0	0		
Satd. Flow (RTOR)								
Lane Group Flow (vph)	0	814	0	0	0	0		
Turn Type		NA						
Protected Phases		2					4	
Permitted Phases								
Detector Phase		2						
Switch Phase								
Minimum Initial (s)		10.0					10.0	
Minimum Split (s)		36.0					21.0	
Total Split (s)		36.0					21.0	
Total Split (%)		63.2%					37%	
Yellow Time (s)		3.3					3.0	
All-Red Time (s)		1.7					1.0	
Lost Time Adjust (s)		0.0						
Total Lost Time (s)		5.0						
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode		Min					None	
Act Effct Green (s)		34.0						
Actuated g/C Ratio		0.64						
v/c Ratio		0.38						
Control Delay		7.5						
Queue Delay		0.0						
Total Delay		7.5						
LOS		А						
Approach Delay		7.5						
Approach LOS		A						
Queue Length 50th (m)		24.0						
Queue Length 95th (m)		34.2						
Internal Link Dist (m)		270.2	176.4		31.3			
Turn Bay Length (m)								
Base Capacity (vph)		2161						
Starvation Cap Reductn		0						
Spillback Cap Reductn		0						
Storage Cap Reductn		0						
Reduced v/c Ratio		0.38						
Intersection Summary								
Cycle Length: 57								
Actuated Cycle Length: 52.8								
Natural Cycle: 60								
Control Type: Semi Act-Uncoo	ord							
Maximum v/c Ratio: 0.38								

Ø6 (R)

Synchro 10 Light Report Page 5

Lanes, Volumes, Timings 3: Chamberlain & Kent		2029 Future Total 05-16-2024
Intersection Signal Delay: 7.5	Intersection LOS: A	
Intersection Capacity Utilization 27.9%	ICU Level of Service A	
Analysis Period (min) 15		
Splits and Phases: 3: Chamberlain & Kent		
ø2	<b>∦</b> \$ø4	
36.0	21 a	

	≯	-	1	1	+	*	*	1	1	1	1	
ane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SE
ane Configurations	LDL	LDI	LDIX	WDL	۹ <b>۴</b> ۵	TIDIT	NDL	41	NDIX	ODL		01
raffic Volume (vph)	0	0	0	160	582	189	278	627	0	0	405	1
uture Volume (vph)	0	0	0	160	582	189	278	627	0	0	405	1
Satd. Flow (prot)	0	0	0	0	4481	0	0	3266	0	0	3022	
It Permitted	, i i i i i i i i i i i i i i i i i i i	· ·	Ū.	Ū	0.991	Ŭ	Ŭ	0.637	Ŭ	· ·	0022	
Satd. Flow (perm)	0	0	0	0	4429	0	0	2045	0	0	3022	
atd. Flow (RTOR)					81					-	44	
ane Group Flow (vph)	0	0	0	0	931	0	0	905	0	0	515	
urn Type				Perm	NA		pm+pt	NA			NA	
Protected Phases					8		5	2			6	
ermitted Phases				8			2					
etector Phase				8	8		5	2			6	
witch Phase												
/inimum Initial (s)				10.0	10.0		5.0	10.0			10.0	
/inimum Split (s)				23.6	23.6		10.4	21.4			21.4	
otal Split (s)				25.0	25.0		15.0	40.0			25.0	
otal Split (%)				33.3%	33.3%		20.0%	53.3%			33.3%	
ellow Time (s)				3.3	3.3		3.3	3.3			3.3	
II-Red Time (s)				2.3	2.3		2.1	2.1			2.1	
ost Time Adjust (s)					0.0			0.0			0.0	
otal Lost Time (s)					5.6			5.4			5.4	
ead/Lag				Lag	Lag						Lag	
ead-Lag Optimize? Recall Mode				Yes	Yes Max		Max	C-Max			Yes C-Max	
				Max	19.4		wax	34.6			0-iviax	
Act Effct Green (s)					0.26			0.46			0.26	
Actuated g/C Ratio					0.20			0.40			0.20	
Control Delay					28.6			12.2			26.2	
Queue Delay					0.0			0.0			0.2	
otal Delay					28.6			12.2			26.4	
OS					20.0 C			B			20.4 C	
pproach Delay					28.6			12.2			26.4	
pproach LOS					20.0 C			- 12.2 B			C	
Queue Length 50th (m)					40.8			10.7			30.8	
Queue Length 95th (m)					54.9			m24.6			46.2	
nternal Link Dist (m)		130.6			383.3			80.8			138.4	
urn Bay Length (m)												
Base Capacity (vph)					1205			1099			822	
Starvation Cap Reductn					0			0			0	
pillback Cap Reductn					0			0			29	
storage Cap Reductn					0			0			0	
Reduced v/c Ratio					0.77			0.82			0.65	
ntersection Summary												
cycle Length: 75												
ctuated Cycle Length: 75												
Offset: 70 (93%), Reference	d to phase	2:NBTL a	and 6:SE	T, Start o	of Green							
latural Cycle: 70												
Control Type: Actuated-Coor	dinated											

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Lanes, Volumes, Timings	
4: Bank & Catherine	

2029 Future Total 05-16-2024

Lane Group	Ø7	Ø9	Ø13
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			_
Satd. Flow (RTOR)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	7	9	13
Permitted Phases	1	9	15
Detector Phase			
Switch Phase			
Minimum Initial (s)	1.0	1.0	1.0
	5.0	5.0	5.0
Minimum Split (s)			
Total Split (s)	5.0	5.0	5.0
Total Split (%)	7%	7%	7%
Yellow Time (s)	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lead		Lead
Lead-Lag Optimize?	Yes		Yes
Recall Mode	Max	Max	Max
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (m)			
Queue Length 95th (m)			
Internal Link Dist (m)			
Turn Bay Length (m)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio		_	_
Neudoeu wo Ralio			
Intersection Summary			

Lanes, Volumes, Timings		2029 Future Total
4: Bank & Catherine		05-16-2024
Maximum v/c Ratio: 0.82		
Intersection Signal Delay: 21.8	Intersection LOS: C	
Intersection Capacity Utilization 80.3%	ICU Level of Service D	

Intersection Capacity Utilization 80.3% ICU I Analysis Period (min) 15 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Bank & Catherine



30-48 Chamberlain AM Peak Hour

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30-48 Chamberlain AM Peak Hour

Lanes, Volumes, Timings <u>3: Chamberlain & Kent</u> 2029 Future Total 05-16-2024

	≯	-	+		1	-		
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø4	
Lane Configurations	5	<u>††</u>						
Traffic Volume (vph)	494	814	0	0	0	0		
Future Volume (vph)	494	814	0	0	0	0		
Satd. Flow (prot)	1658	3316	0	0	0	0		
Flt Permitted	0.950		-	-	-	-		
Satd. Flow (perm)	1658	3316	0	0	0	0		
Satd. Flow (RTOR)	494	0010	U	U	v	v		
Lane Group Flow (vph)	494	814	0	0	0	0		
Turn Type	Perm	NA	0	0	0	0		
Protected Phases	reini	2					4	
Permitted Phases	2	2					4	
Detector Phase	2	2						
	2	2						
Switch Phase	40.0	40.0					40.0	
Minimum Initial (s)	10.0	10.0					10.0	
Minimum Split (s)	36.0	36.0					21.0	
Total Split (s)	36.0	36.0					21.0	
Total Split (%)	63.2%	63.2%					37%	
Yellow Time (s)	3.3	3.3					3.0	
All-Red Time (s)	1.7	1.7					1.0	
Lost Time Adjust (s)	0.0	0.0						
Total Lost Time (s)	5.0	5.0						
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	Min	Min					None	
Act Effct Green (s)	36.2	36.2						
Actuated q/C Ratio	0.66	0.66						
v/c Ratio	0.39	0.37						
Control Delay	1.7	7.1						
Queue Delay	0.0	0.0						
Total Delay	1.7	7.1						
LOS	A	A						
Approach Delay	A	5.1						
Approach LOS		3.1 A						
	0.0	24.0	_				_	
Queue Length 50th (m)	0.0 9.1	24.0 33.6						
Queue Length 95th (m)	9.1		176 4		21.2		_	
Internal Link Dist (m)		270.2	176.4		31.3			
Turn Bay Length (m)	4004	0400	_					
Base Capacity (vph)	1264	2196						
Starvation Cap Reductn	0	0						
Spillback Cap Reductn	0	0						
Storage Cap Reductn	0	0						
Reduced v/c Ratio	0.39	0.37						
Intersection Summary								
Cycle Length: 57								
Actuated Cycle Length: 55								
Natural Cycle: 60								
Control Type: Semi Act-Unco	oord							
Maximum v/c Ratio: 0.39								

30-48 Chamberlain AM Peak Hour

Synchro 10 Light Report Page 1

Lanes, Volumes, Timings 3: Chamberlain & Kent		2029 Future Total 05-16-2024
Intersection Signal Delay: 5.1	Intersection LOS: A	
Intersection Capacity Utilization 33.1%	ICU Level of Service A	
Analysis Period (min) 15		

Splits and Phases: 3: Chamberlain & Kent

		A 804	
36 s		21 s	

30-48 Chamberlain AM Peak Hour

Lanes, Volumes, Tir 1: HWY 417 OR/Lyc		atherin	е						:	2029 F	uture	Total 16-2024
	≯	-	$\mathbf{r}$	4	+	*	•	1	1	1	Ļ	1
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					4 <b>†</b> î»						•	1
Traffic Volume (vph)	0	0	0	247	558	0	0	0	0	0	438	270
Future Volume (vph)	0	0	0	247	558	0	0	0	0	0	438	270
Satd. Flow (prot)	0	0	0	0	4693	0	0	0	0	0	1745	1483
Flt Permitted					0.985							
Satd. Flow (perm)	0	0	0	0	4657	0	0	0	0	0	1745	1443
Satd. Flow (RTOR)					153							75
Lane Group Flow (vph)	0	0	0	0	805	0	0	0	0	0	438	270
Turn Type				Perm	NA						NA	Perm
Protected Phases					6						4	
Permitted Phases				6	-							4
Detector Phase				6	6						4	4
Switch Phase				Ū	Ŭ							-
Minimum Initial (s)				10.0	10.0						10.0	10.0
Minimum Split (s)				26.2	26.2						28.3	28.3
Total Split (s)				28.0	28.0						47.0	47.0
Total Split (%)				37.3%	37.3%						62.7%	62.7%
Yellow Time (s)				3.3	3.3						3.3	3.3
All-Red Time (s)				3.3 1.9	3.3 1.9						2.0	2.0
				1.9	0.0						2.0	2.0
Lost Time Adjust (s)					5.2						5.3	5.3
Total Lost Time (s)					5.2						5.3	5.3
Lead/Lag Lead-Lag Optimize?												
Recall Mode				C-Max	C-Max						Мах	Max
				C-IVIAX							41.7	
Act Effct Green (s)					22.8 0.30						41.7 0.56	41.7
Actuated g/C Ratio												0.56
v/c Ratio					0.53						0.45	0.32
Control Delay					16.6						11.8	7.6
Queue Delay					0.0						0.0	0.0
Total Delay					16.6						11.8	7.6
LOS					В						В	A
Approach Delay					16.6						10.2	
Approach LOS					В						В	
Queue Length 50th (m)					9.4						33.7	13.0
Queue Length 95th (m)					15.1						53.9	25.8
Internal Link Dist (m)		117.8			157.8			120.4			277.6	
Turn Bay Length (m)												
Base Capacity (vph)					1522						970	835
Starvation Cap Reductn					0						0	0
Spillback Cap Reductn					0						0	0
Storage Cap Reductn					0						0	0
Reduced v/c Ratio					0.53						0.45	0.32
Intersection Summary												
Cycle Length: 75												
Actuated Cycle Length: 75												
Offset: 24 (32%), Referenced	to phase	2: and 6:	WBTL, S	start of Gr	reen							
Natural Cycle: 55												
Control Type: Actuated-Coor	dinated											

Synchro 10 Light Report Page 1

Lanes, Volumes, Timings 1: HWY 417 OR/Lyon & Catherine		2029 Future Total 05-16-2024
Maximum v/c Ratio: 0.53		
Intersection Signal Delay: 13.6	Intersection LOS: B	
Intersection Capacity Utilization 54.2%	ICU Level of Service A	
Analysis Period (min) 15		

Splits and Phases: 1: HWY 417 OR/Lyon & Catherine

30-48 Chamberlain PM PEAK HOUR



Lane Configurations         If         If <thif< th="">         If         If         If<th>NBR 0 0 0 0</th><th>SBL           0           0           0           0           0           0           0</th><th>SBT 0 0 0 0</th><th>SBF ( ( (</th></thif<>	NBR 0 0 0 0	SBL           0           0           0           0           0           0           0	SBT 0 0 0 0	SBF ( ( (
Tredfic Volume (vph)       0       0       0       702       341       25       761         Future Volume (vph)       0       0       0       702       341       25       761         Satd. Flow (port)       0       0       0       313       1350       0       4755         Fit Permitted       0       0       0       3143       1350       0       4755         Satd. Flow (perm)       0       0       0       3143       1247       0       4752         Satd. Flow (perm)       0       0       0       3143       1247       0       4752         Satd. Flow (perm)       0       0       0       0       3143       1247       0       4752         Satd. Flow (perm)       0       0       0       0       736       307       0       786         Lame Group Flow (vph)       0       0       0       0       786       8       8         Detector Phase       6       6       8       8       8       8       8       8       8       8       8       8       8       8       8       8       8       8       8       8       8	0 0 0	0 0	0 0	(
Traffic Volume (vph)       0       0       0       702       341       25       761         Future Volume (vph)       0       0       0       702       341       25       761         Future Volume (vph)       0       0       0       3143       1350       0       4755         Stadt Flow (perm)       0       0       0       3143       1247       0       4752         Sadt Flow (perm)       0       0       0       3143       1247       0       4752         Sadt Flow (perm)       0       0       0       3143       1247       0       4752         Sadt Flow (perm)       0       0       0       0       3143       1247       0       4752         Sadt Flow (perm)       0       0       0       0       736       307       0       786         Furm Type       NA       Perm       Perm       NA       Perm       Perm       NA         Permited Phases       6       6       8       8       8       8       8         Detector Phase       10.0       10.0       10.0       10.0       10.0       10.0       10.0       10.0       10.0 <td>0 0 0</td> <td>0 0</td> <td>0 0</td> <td>(</td>	0 0 0	0 0	0 0	(
Satd. Flow (prot)         0         0         0         0         3143         1350         0         4755           I'lt Permitted         0         0         0         3143         1350         0         4755           Satd. Flow (perm)         0         0         0         3143         1247         0         4752           Satd. Flow (perm)         0         0         0         3143         1247         0         4752           Satd. Flow (perm)         0         0         0         736         307         0         786           furn Type         NA         Perm         Perm         NA         Perm         NA           Permitted Phases         6         6         8         8         9	0	0	0	
Fit Permitted       0.998         Satd. Flow (perm)       0       0       0.3143       1247       0.4752         Satd. Flow (perm)       0       0       0.736       307       0.786         Jane Group Flow (vph)       0       0       0.736       307       0.786         Furm Type       NA       Perm       NA       Perm       NA         Pertected Phases       6       6       8       8         Detector Phase       10.0       10.0       10.0       10.0       10.0         Vinimum Initial (s)       10.0       10.0       10.0       10.0       10.0         Vinimum Split (s)       27.8       27.8       17.8       17.8         Total Split (s)       38.0       38.0       32.0       32.0         Valleed Time (s)       2.5       2.5       2.5       2.5         Cotal Split (%)       50.7%       50.7%       42.7%       42.7%         Valleed Time (s)       2.5	0	0	0	
Satd. Flow (perm)         0         0         0         0         3143         1247         0         4752           Satd. Flow (RTOR)         70         70         70         70         70           ane Group Flow (vph)         0         0         0         736         307         0         786           Urim Type         NA         Perm         Perm         NA         Perm         NA           Protected Phases         6         6         8         8         8         8           Ordected Phase         6         6         8 <td></td> <td></td> <td></td> <td></td>				
Satd. Flow (RTOR)         70           care Group Flow (vph)         0         0         0         736         307         0         786           furn Type         NA         Perm         Perm         NA         Perm         NA           rotected Phases         6         8         8         8         8         9           Permitted Phases         6         6         8         8         8         9         9         9         10.0				1
Lane Group Flow (vph)         0         0         0         736         307         0         786           Yum Type         NA         Perm         Perm         NA         Perm         NA           Protected Phases         6         8         8         8         8           Permited Phases         6         6         8         8         8           Permited Phases         6         6         8         8           Switch Phase         10.0         10.0         10.0         10.0         10.0           Minimum Split (s)         27.8         27.8         17.8         17.8         17.8           Total Split (%)         50.7%         50.7%         42.7%         42.7%         42.7%           Cellow Time (s)         3.3	0	0	0	
Turn Type         NA         Perm         Perm         NA           Protected Phases         6         8         8         9         8         8         9         <	0	0	0	
Botected Phases         6         8           Permitted Phases         6         8           Detector Phase         6         6         8           Detector Phase         6         6         8           Minimum Initial (s)         10.0         10.0         10.0         10.0           Minimum Split (s)         27.8         27.8         17.8         17.8           Total Split (s)         38.0         38.0         32.0         32.0           Total Split (s)         50.7%         50.7%         42.7%         42.7%           Vicial Split (s)         50.7%         50.7%         42.7%         42.7%           Vicial Split (s)         0.0         0.0         0.0         0.0         0.0           Vicial Lost Time (s)         2.5         2				(
fermitted Phases         6         8           Detector Phase         6         6         8         8           Switch Phase         0         10.0         10.0         10.0         10.0           Minimum Initial (s)         10.0         10.0         10.0         10.0         10.0         10.0           Minimum Split (s)         27.8         27.8         17.8         17.8         17.8           Total Split (s)         27.6         50.7%         42.7%         42.7%         42.7%           (ellow Time (s)         3.3 <td></td> <td></td> <td></td> <td></td>				
Detector Phase         6         6         8         8           Witch Phase         10.0         10.0         10.0         10.0           Minimum Initial (s)         10.0         10.0         10.0         10.0           Inimum Initial (s)         27.8         27.8         17.8         17.8           Total Split (s)         27.8         27.8         17.8         17.8           Total Split (s)         38.0         38.0         32.0         32.0           fold Split (%)         50.7%         50.7%         42.7%         42.7%           fold Split (%)         50.7%         50.7%         42.7%         42.7%           fold Split (%)         50.7%         50.7%         42.7%         42.7%           (ellow Time (s)         3.3				
Switch Phase         10.0         10.0         10.0         10.0           Minimum Initial (s)         10.0         10.0         10.0         10.0           Minimum Split (s)         27.8         27.8         17.8         17.8           fotal Split (s)         38.0         38.0         32.0         32.0           fotal Split (%)         50.7%         50.7%         42.7%         42.7%           Vellow Time (s)         25         2.5				
Inimum Initial (s)         10.0         10.0         10.0         10.0           Minimum Split (s)         27.8         27.8         17.8         17.8           Total Split (s)         38.0         32.0         32.0         32.0           Total Split (s)         50.7%         50.7%         42.7%         42.7%           Velow Time (s)         3.3         3.3         3.3         3.3           NI-Red Time (s)         2.5         2.5         2.5         2.5           Lost Time Adjust (s)         0.0         0.0         0.0         0.0           Cotal Lost Time (s)         5.8         5.8         5.8         5.8           .ead/Lag         Lag         Lag         Lag         Lag           .ead-Mode         C-Max         C-Max         Max         Max           Vact Effcl Green (s)         32.2         32.2         26.2         26.2           Vactuated g/C Ratio         0.43         0.43         0.35         ////////////////////////////////////				
Jinimum Split (s)         27.8         27.8         17.8         17.8           Total Split (s)         38.0         38.0         32.0         32.0           Total Split (%)         50.7%         50.7%         42.7%         42.7%           (ellow Time (s)         3.3         3.3         3.3         3.3         3.3           NI-Red Time (s)         2.5         2.5         2.5         2.5         2.5           cost Time Adjust (s)         0.0         0.0         0.0         0.0         0.0           Total Lost Time (s)         5.8         5.8         5.8         5.8         5.8           e.ead/Lag         Lag				
Total Split (s)         38.0         38.0         32.0         32.0           Total Split (%)         50.7%         50.7%         42.7%         42.7%           fellow Time (s)         3.3         3.4         4.7         X.5         5.5         5.5         5.5         5.8         5.8         5.8         5.8 </td <td></td> <td></td> <td></td> <td></td>				
Total Split (%)         50.7%         50.7%         42.7%         42.7%           (ellow Time (s)         3.3         3.3         3.3         3.3         3.3           NIR-Red Time (s)         2.5         2.6         2.4         2.4         2.6         2.4         2.6         2.4         2.6         2.4         2.6         2.4         2.6         2.4         2.6         2.4         2.6         2.4         2.6         2.4         2.6         2.4         2.6         2.4         2.6         2.4         2.6         2.4         2.6         2.4         2.6				
Yellow Time (s)         3.3         3.3         3.3         3.3         3.3           NI-Red Time (s)         2.5         2.6         2         2.6         2         2.6         2         2.6         2         2.6         2         2.6         2         2.6         2         2.6         2         2.6         2         2.6         2         2.6         2         2.6         2         2.6         2         2.6         2         2.6         2         2.6         2				
NI-Red Time (s)         2.5         2.5         2.5         2.5         2.5           cost Time Adjust (s)         0.0         0				
ost Time Adjust (s)         0.0         0.0         0.0           fotal Lost Time (s)         5.8         5.8         5.8         5.8           ead/Lag         Lag				
Total Lost Time (s)         5.8         5.8         5.8           e.ead/Lag         Lag         Lag         Lag           e.ead/Lag Optimize?         Recall Mode         C-Max         C-Max         Max           kct Effct Green (s)         32.2         32.2         26.2           kctuated g/C Ratio         0.43         0.43         0.35           /c Ratio         0.55         0.57         0.46           Jointrol Delay         15.5         17.8         18.2           Queue Delay         0.0         0.0         0.0           forlal Delay         15.5         17.8         18.2           LOS         B         B         B           Approach Delay         16.2         18.2				
Lag         Lag         Lag           e.ead/Lag Optimize?         C-Max         C-Max         Max           Recall Mode         C-Max         C-Max         Max           Ket EftG Green (s)         32.2         32.2         26.2           Actuated g/C Ratio         0.43         0.43         0.35           /c Ratio         0.55         0.57         0.46           Control Delay         15.5         17.8         18.2           Queue Delay         0.0         0.0         0.0           Total Delay         15.5         17.8         18.2           QOS         B         B         B         A           Approach Delay         16.2         18.2         18.2				
Lead-Lag Optimize?         Xerall Mode         C-Max         C-Max         Max         Max           Vaceal IMode         C-Max         C-Max         Max         Max         Act         Science				
Recall Mode         C-Max         C-Max         Max         Max           Act Effet Green (s)         32.2         32.2         26.2           Actuated g/C Ratio         0.43         0.43         0.35           //c Ratio         0.55         0.57         0.46           Option Delay         15.5         17.8         18.2           Queue Delay         0.0         0.0         0.0           fold Delay         15.5         17.8         18.2           QS         B         B         B           Approach Delay         16.2         18.2           Deproach LOS         B         B         B				
Act Effct Green (s)         32.2         32.2         26.2           Actuated g/C Ratio         0.43         0.43         0.35           //c Ratio         0.55         0.57         0.46           Jointrol Delay         15.5         17.8         18.2           Queue Delay         0.0         0.0         0.0           Total Delay         15.5         17.8         18.2           LOS         B         B         B         Approach Delay           LOS         B         B         B         B           Approach LOS         B         B         B         B				
Actuated g/C Ratio         0.43         0.43         0.35           //c Ratio         0.55         0.57         0.46           Control Delay         15.5         17.8         18.2           Jueue Delay         0.0         0.0         0.0           Total Delay         15.5         17.8         18.2           Josephile         0.0         0.0         0.0           Total Delay         15.5         17.8         18.2           JOS         B         B         B           Approach Delay         16.2         18.2           Approach LOS         B         B				
I/c Ratio         0.55         0.57         0.46           Control Delay         15.5         17.8         18.2           Jueue Delay         0.0         0.0         0.0           Iotal Delay         15.5         17.8         18.2           OS         B         B         B           Approach Delay         16.2         18.2           Approach LOS         B         B				
Control Delay         15.5         17.8         18.2           Dueue Delay         0.0         0.0         0.0           Total Delay         15.5         17.8         18.2           LOS         B         B         B           Approach Delay         16.2         18.2           Approach LOS         B         B				
Queue Delaý         0.0         0.0         0.0           Total Delay         15.5         17.8         18.2           LOS         B         B         B           Approach Delay         16.2         18.2           Approach LOS         B         B				
Total Delay         15.5         17.8         18.2           .OS         B         B         B           Approach Delay         16.2         18.2           Approach LOS         B         B				
OS         B         B         B           Approach Delay         16.2         18.2           Approach LOS         B         B				
Approach Delay         16.2         18.2           Approach LOS         B         B				
Approach LOS B B				
Queue Length 50th (m) 35.3 29.5 28.0				
Queue Length 95th (m) m40.7 m37.1 38.3				
nternal Link Dist (m) 157.8 130.6 43.8			56.6	
Furn Bay Length (m)				
Base Capacity (vph) 1349 535 1705				
Starvation Cap Reductn 0 0 0				
Spillback Cap Reductn 0 0 0				
Storage Cap Reductn 0 0 0				
Reduced v/c Ratio 0.55 0.57 0.46				
ntersection Summary				
Cycle Length: 75				
Actuated Cycle Length: 75				

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Lanes, Volumes, Timings	2029 Future Total
2: Kent & Catherine	05-16-2024

Lane Group	Ø5		
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Satd. Flow (RTOR)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	5		
Permitted Phases			
Detector Phase			
Switch Phase			
Minimum Initial (s)	1.0		
Minimum Split (s)	5.0		
Total Split (s)	5.0		
Total Split (%)	7%		
Yellow Time (s)	2.0		
All-Red Time (s)	0.0		
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lead		
Lead-Lag Optimize?			
Recall Mode	Max		
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (m)			
Queue Length 95th (m)			
Internal Link Dist (m)			
Turn Bay Length (m)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

30-48 Chamberlain PM PEAK HOUR

Maximum v/c Ratio: 0.57		
Intersection Signal Delay: 17.0	Intersection LOS: B	
Intersection Capacity Utilization 52.8%	ICU Level of Service A	
Analysis Period (min) 15		

●øs ← Ø6 (R)	<b>™</b> ø8
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3: Chamberlain & Ker	≯		+	*	1	1		
	-	-		<u>`</u>	-		~ .	
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø4	
Lane Configurations		<u></u>						
Traffic Volume (vph)	0	779	0	0	0	0		
Future Volume (vph)	0	779	0	0	0	0		
Satd. Flow (prot)	0	3316	0	0	0	0		
Flt Permitted	•	0040	0	0	0	0		
Satd. Flow (perm)	0	3316	0	0	0	0		
Satd. Flow (RTOR)	0	770	0	0	0	0		
Lane Group Flow (vph)	U	779	0	U	0	0		
Turn Type		NA						
Protected Phases		2					4	
Permitted Phases		0						
Detector Phase		2						
Switch Phase		10.0					10.0	
Minimum Initial (s)								
Minimum Split (s)		36.0					21.0	
Total Split (s)		36.0					21.0	
Total Split (%)		63.2%					37%	
Yellow Time (s)		3.3					3.0	
All-Red Time (s)		1.7					1.0	
Lost Time Adjust (s)		0.0						
Total Lost Time (s)		5.0						
Lead/Lag								
Lead-Lag Optimize?		N.C.,					Maria	
Recall Mode		Min					None	
Act Effct Green (s)		34.7 0.83						
Actuated g/C Ratio		0.83						
v/c Ratio								
Control Delay		4.3 0.0						
Queue Delay		4.3						
Total Delay								
LOS Approach Delay		A 4.3						
Approach Delay		4.3 A						
Approach LOS		0.0						
Queue Length 50th (m) Queue Length 95th (m)		32.5						
Internal Link Dist (m)		270.2	176.4		23.7			
Turn Bay Length (m)		210.2	170.4		23.1			
Base Capacity (vph)		2740						
Starvation Cap Reductn		2740						
Spillback Cap Reductn		0						
Storage Cap Reductn		0						
Reduced v/c Ratio		0.28						
Intersection Summary		0.20						
Cycle Length: 57		_						
Actuated Cycle Length: 42 Natural Cycle: 60								
Control Type: Semi Act-Uncoor	d							
Maximum v/c Ratio: 0.28	u							
Maximulli V/C Ratio. 0.20								

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Lanes, Volumes, Timings 3: Chamberlain & Kent		2029 Future Total 05-16-2024
Intersection Signal Delay: 4.3	Intersection LOS: A	
Intersection Capacity Utilization 26.9%	ICU Level of Service A	
Analysis Period (min) 15		
Splits and Phases: 3: Chamberlain & Kent		
•ø2		
36.0	21 c	

	≯	_	~	1	+		•	†	*	1	T	
ane Group	EBL	EBT	EBR	WBL	WBT	WBR	۱ NBL	NBT	NBR	SBL	SBT	SE
ane Configurations	EDL	EDI	EDR	VVDL	4 <b>†</b> }	WDR	INDL	1 dvi	INDIN	JDL	 <b>≜1</b> ≽	30
raffic Volume (vph)	0	0	0	287	618	175	218	4 T 357	0	0	<b>T</b> ₽ 643	1
uture Volume (vph)	0	0	0	287	618	175	210	357	0	0	643	1
Satd. Flow (prot)	0	0	0	207	4536	0	210	3253	0	0	3063	
It Permitted	0	0	0	0	0.987	0	0	0.545	0	0	3003	
Satd. Flow (perm)	0	0	0	0	4474	0	0	1769	0	0	3063	
Satd. Flow (RTOR)	0	0	0	0	50	0	0	1709	0	0	3003	
ane Group Flow (vph)	0	0	0	0	1080	0	0	575	0	0	773	
um Type	0	0	0	Perm	NA	0	pm+pt	NA	0	0	NA	
Protected Phases				Feilii	8		рш+рі 5	2			6	
ermitted Phases				8	0		2	2			0	
etector Phase				8	8		5	2			6	
witch Phase				0	0		5	2			0	
				10.0	10.0		5.0	10.0			10.0	
Ainimum Initial (s)				23.6	23.6			21.4			21.4	
Ainimum Split (s)							10.4					
Total Split (s)				24.0 32.0%	24.0 32.0%		14.0 18.7%	41.0 54.7%			27.0 36.0%	
otal Split (%)												
(ellow Time (s)				3.3	3.3		3.3	3.3			3.3	
II-Red Time (s)				2.3	2.3		2.1	2.1			2.1	
ost Time Adjust (s)					0.0			0.0			0.0	
otal Lost Time (s)					5.6			5.4			5.4	
.ead/Lag				Lag	Lag						Lag	
ead-Lag Optimize?								0.14			Yes	
Recall Mode				Max	Max		Max	C-Max			C-Max	
ct Effct Green (s)					18.4			35.6			21.6	
ctuated g/C Ratio					0.25			0.47			0.29	
/c Ratio					0.95			0.57			0.86	
Control Delay					45.4			12.6			35.4	
Queue Delay					0.1			0.0			3.7	
otal Delay					45.5			12.6			39.1	
OS					D			В			D	
pproach Delay					45.5			12.6			39.1	
pproach LOS					D			В			D	
Queue Length 50th (m)					52.8			16.1			51.8	
Queue Length 95th (m)					#79.9			20.3			#81.8	
nternal Link Dist (m)		130.6			383.3			80.8			138.4	
urn Bay Length (m)												
Base Capacity (vph)					1135			1009			904	
Starvation Cap Reductn					0			0			0	
pillback Cap Reductn					1			0			73	
Storage Cap Reductn					0			0			0	
Reduced v/c Ratio					0.95			0.57			0.93	
ntersection Summary												
Cycle Length: 75												
Actuated Cycle Length: 75												
Offset: 50 (67%), Reference	d to phase	2:NBTL a	and 6:SE	T, Start o	of Green							
latural Cycle: 70												
control Type: Actuated-Coor	dinated											

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Lanes, Volumes, Timings	
4: Bank & Catherine	

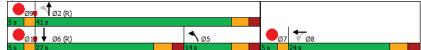
2029 Future Total 05-16-2024

Lane Group	Ø7	Ø9	Ø13
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Satd. Flow (RTOR)			
Lane Group Flow (vph)		_	
Turn Type			
Protected Phases	7	9	13
Permitted Phases	1	9	10
Detector Phase			
Switch Phase			
	1.0	1.0	1.0
Minimum Initial (s)	1.0 5.0	5.0	5.0
Minimum Split (s)			
Total Split (s)	5.0	5.0	5.0
Total Split (%)	7%	7%	7%
Yellow Time (s)	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lead		Lead
Lead-Lag Optimize?			Yes
Recall Mode	Max	Max	Max
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (m)			
Queue Length 95th (m)			
Internal Link Dist (m)		_	
Turn Bay Length (m)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductin			
Reduced v/c Ratio		_	_
Neudeu we Rallo			
Intersection Summary			

Lanes, Volumes, Timings 4: Bank & Catherine		2029 Future Total 05-16-2024
Maximum v/c Ratio: 0.95		00102021
Intersection Signal Delay: 35.7	Intersection LOS: D	
Intersection Capacity Utilization 80.7%	ICU Level of Service D	
Analysis Period (min) 15		

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

Splits and Phases: 4: Bank & Catherine



30-48 Chamberlain PM PEAK HOUR

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30-48 Chamberlain PM PEAK HOUR

	۶	-	$\rightarrow$	1	+	*	۸.	1	1	1	÷.	-
ane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SB
ane Configurations		t},	1					<b>≜</b> 1≽			- <b>4</b> ↑	
raffic Volume (vph)	57	592	121	0	0	0	0	500	91	175	720	
uture Volume (vph)	57	592	121	0	0	0	0	500	91	175	720	
Satd. Flow (prot)	0	3302	1483	0	0	0	0	3115	0	0	3283	
It Permitted		0.996									0.705	
Satd. Flow (perm)	0	3299	1345	0	0	0	0	3115	0	0	2296	
Satd. Flow (RTOR)			134					29				
ane Group Flow (vph)	0	649	121	0	0	0	0	591	0	0	895	
urn Type	Perm	NA	Perm					NA		pm+pt	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4							6		
Detector Phase	4	4	4					2		1	6	
Switch Phase												
/linimum Initial (s)	10.0	10.0	10.0					10.0		5.0	10.0	
/linimum Split (s)	26.2	26.2	26.2					23.1		11.1	23.1	
otal Split (s)	31.0	31.0	31.0					30.0		14.0	44.0	
otal Split (%)	41.3%	41.3%	41.3%					40.0%		18.7%	58.7%	
'ellow Time (s)	3.3	3.3	3.3					3.0		3.0	3.0	
All-Red Time (s)	2.9	2.9	2.9					3.1		3.1	3.1	
ost Time Adjust (s)		0.0	0.0					0.0			0.0	
otal Lost Time (s)		6.2	6.2					6.1			6.1	
.ead/Lag								Lead		Lag		
ead-Lag Optimize?								Yes		Yes		
Recall Mode	None	None	None					C-Max		None	C-Max	
ct Effct Green (s)		20.6	20.6					42.1			42.1	
ctuated g/C Ratio		0.27	0.27					0.56			0.56	
/c Ratio		0.72	0.26					0.34			0.69	
Control Delay		29.1	4.7					9.6			13.8	
Queue Delay		0.0	0.0					0.0			3.0	
otal Delay		29.1	4.7					9.6			16.7	
.OS		С	A					A			В	
pproach Delay		25.3						9.6			16.7	
pproach LOS		C						A			B	
Queue Length 50th (m)		43.5	0.0					20.4			71.6	
Queue Length 95th (m)		55.7	8.7		040.4			34.4			m84.2	
nternal Link Dist (m)		176.4	20.0		219.4			129.7			80.8	
urn Bay Length (m)		1090	30.0 534					1762			1290	
Base Capacity (vph)		0	534 0					0				
Starvation Cap Reductn		0	0					0			281	
Spillback Cap Reductn		0	0					0			0	
Reduced v/c Ratio		0.60	0.23					0.34			0.89	
		0.00	0.23					0.34			0.09	
ntersection Summary												
Cycle Length: 75												
Actuated Cycle Length: 75				., Start of								

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Lanes, Volumes, Timings	2029 Future Total
5: Bank & Chamberlain/Isabella	05-16-2024
Maximum v/c Ratio: 0.72	

Intersection Signal Delay: 17.8	Intersection LOS: B	
Intersection Capacity Utilization 82.9%	ICU Level of Service E	
Analysis Period (min) 15		

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

Splits and Phases: 5: Bank & Chamberlain/Isabella

Ø2 (R)	Ø1	<b>↓</b> <sub>Ø4</sub>	
30 s	14 s	31 s	
Ø6 (R)			
44 s			

30-48 Chamberlain PM PEAK HOUR



TDM Checklist



# Multi-Modal Level of Service - Segments Form

Consultant	CGH Transportation		Project	2022-117	
Scenario	Present/Future		Date	2023-04-28	
Comments					
			Chamberlain	Chamberlain	
SEGMENTS		Street A	EB (Existing)	EB (Future)	
	Sidewalk Width		1.8 m	≥ 2 m	
	Boulevard Width		< 0.5 m	0.5 - 2 m	
	Avg Daily Curb Lane Traffic Volume		> 3000	> 3000	
an	Operating Speed		> 50 to 60 km/h	> 50 to 60 km/h	
Pedestrian	On-Street Parking	_	no	no	
es	Exposure to Traffic PLoS	F	F	D	-
eq	Effective Sidewalk Width		1.5 m	3.0 m	
<u>م</u>	Pedestrian Volume		250 ped/hr	250 ped/hr	
	Crowding PLoS		В	A	-
	Level of Service		F	D	-
	Type of Cycling Facility		Mixed Traffic	Physically Separated	
				Separated	
	Number of Travel Lanes		2-3 lanes total		
	Operating Speed		≥ 50 to 60 km/h		
	# of Lanes & Operating Speed LoS		E	-	-
ycle	Bike Lane (+ Parking Lane) Width				
ې کې	Bike Lane Width LoS	E	-	-	-
Bic	Bike Lane Blockages				
_	Blockage LoS		-	-	-
	Median Refuge Width (no median = < 1.8 m)		< 1.8 m refuge		
	No. of Lanes at Unsignalized Crossing		≤ 3 lanes		
	Sidestreet Operating Speed		≤ 40 km/h		
	Unsignalized Crossing - Lowest LoS		A	A	-
	Level of Service		E	A	-
it	Facility Type		Mixed Traffic	Mixed Traffic	
Su	Friction or Ratio Transit:Posted Speed	О	Vt/Vp ≥ 0.8	Vt/Vp ≥ 0.8	
Transit	Level of Service		D	D	
					-
×	Truck Lane Width		> 3.7 m	> 3.7 m	
Truck	Travel Lanes per Direction	Α	> 1	> 1	
È	Level of Service		Α	А	-
Auto	Level of Service		Not Ap	plicable	

# Multi-Modal Level of Service - Intersections Form

<th< th=""><th>Consultant Scenario Comments</th><th>CGH Transportation Existing</th><th></th><th>Project Date</th><th>2022-117 2023-04-28</th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th></th<>	Consultant Scenario Comments	CGH Transportation Existing		Project Date	2022-117 2023-04-28																	
Processing bild         North	Comments										Unlocked Rows	s for Replicating	9									
Crossing Side         MARIE         MARIE        MARIE         MARIE		INTERSECTIONS		Cham	berlain/Kent			Lvon/Ram	n/Catherine			Kent/C	atherine			Bank/(	atherine			Bank/Chamb	erlain/Isabella	
Add         Add <th></th> <th>Crossing Side</th> <th>NORTH</th> <th></th> <th></th> <th>WEST</th> <th>NORTH</th> <th></th> <th></th> <th>WEST</th> <th>NORTH</th> <th></th> <th></th> <th>WEST</th> <th>NORTH</th> <th></th> <th></th> <th>WEST</th> <th>NORTH</th> <th>SOUTH</th> <th>EAST</th> <th>WEST</th>		Crossing Side	NORTH			WEST	NORTH			WEST	NORTH			WEST	NORTH			WEST	NORTH	SOUTH	EAST	WEST
Proprio         Calculation         <		Lanes			3		0 - 2	3	4	3	5	4	3	3	4	4	3	4	4	4	3	3
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		Right Turns on Red (RToR) ?			RTOR prohibited		RTOR allowed	RTOR prohibited	RTOR prohibited	RTOR prohibited	RTOR allowed	RTOR prohibited	RTOR allowed	RTOR prohibited	RTOR prohibited	RTOR allowed	RTOR prohibited	RTOR allowed				
		Ped Signal Leading Interval?			No		No	No	No	No	Yes	Yes	No	No	Yes	Yes	Yes	Yes	No	No	No	No
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Norm         Approach From         Norm         South         EAST         Norm         South		Level of Service	-	-		-	A			Α	D			A	C		<u> </u>	С	С	В	C	Α
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		Bicycle Lane Arrangement on Approach											Mixed Traffic									Mixed Traffic
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Number of Receiving Lanes on Departure	E				В				С												E	
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	pnr	rrom intersection																				D
Level of Service - D D D	F	Level of Service																			- D	
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Volume to capacity haloControl of the capacity haloControl of the capacity haloLevel of ServiceAABD									_												D	

# Multi-Modal Level of Service - Intersections Form

Consultant Scenario	CGH Transportation Future		Project Date	2022-117 2023-04-28		]															
Comments			_							Unlocked Rows	for Replicating	I									
	INTERSECTIONS		Chamberlain/	/Kent/Site Access			Lyon/Ram	p/Catherine			Kent/Ca	atherine			Bank/	Catherine			Bank/Chamb	oerlain/Isabella	
	Crossing Side	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST
	Lanes			3		0-2	3	3	3	3	4	4	0-2	4	4	3	3	4	4	0-2	3
	Median			No Median - 2.4 m		No Median - 2.4 m			No Median - 2.4 m			No Median - 2.4 m				No Median - 2.4 m	Protected/	No Median - 2.4 m		Protected/	
	Conflicting Left Turns			No left turn / Prohib.		No left turn / Prohib.	Permissive	No left turn / Prohib.	. No left turn / Prohib.	No left turn / Prohib.	No left turn / Prohib.	No left turn / Prohib.	Permissive	No left turn / Prohib.	Permissive	No left turn / Prohib	Permissive	Permissive	No left turn / Prohib.	Permissive	No left turn / Prohib.
	Conflicting Right Turns			No right turn		Permissive or yield control	No right turn	No right turn	Permissive or yield control	Permissive or yield control	No right turn	No right turn	No right turn	Permissive or yield control	No right turn	No right turn	Permissive or yield control	No right turn	No right turn	Permissive or yield control	No right turn
	Right Turns on Red (RToR) ?			RTOR prohibited		RTOR allowed	RTOR prohibited	RTOR prohibited	RTOR prohibited	RTOR prohibited	RTOR prohibited	RTOR prohibited	RTOR prohibited	RTOR allowed	RTOR prohibited	RTOR allowed	RTOR prohibited	RTOR prohibited	RTOR allowed	RTOR prohibited	RTOR allowed
	Ped Signal Leading Interval?			No		No	No	No	No	Yes	Yes	No	No	Yes	Yes	Yes	Yes	No	No	No	No
E	Right Turn Channel			No Right Turn		No Channel	No Right Turn	No Right Turn	No Right Turn	No Channel	No Right Turn	No Right Turn	No Right Turn	No Channel	No Right Turn	No Right Turn	No Channel	No Right Turn	No Right Turn	No Channel	Smart Channel
stria	Corner Radius			No Right Turn		0-3m	No Right Turn	No Right Turn	No Right Turn	3-5m	No Right Turn	No Right Turn	No Right Turn	3-5m	No Right Turn	No Right Turn	3-5m	No Right Turn	No Right Turn	5-10m	5-10m
des				Zebra stripe hi-vis			Zebra stripe hi-vis	Std transverse	Std transverse		Zebra stripe hi-vis	Zebra stripe hi-vis	Zebra stripe hi-vis	Zebra stripe hi-vis	Zebra stripe hi-vis	-		Zebra stripe hi-vis	Zebra stripe hi-vis		Zebra stripe hi-vis
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	Ped. Exposure to Traffic LoS Cycle Length	-	-	А	-	А	Α	Α	А	В	В	В	А	с	В	А	В	С	В	Α	А
	Effective Walk Time	-																			
	Average Pedestrian Delay																				
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	Laure La Commission	-	-	A	-	Α	Α	Α	Α	В	В	В	A	С	В	A	В	С	В	Α	A
	Level of Service			Α				Α			E	В				С				С	
	Approach From	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST
	Bicycle Lane Arrangement on Approach											Mixed Traffic									Curb Bike Lane, Cycletrack or MUP
																					-
	Right Turn Lane Configuration											> 50 m									Not Applicable
	Right Turning Speed											>25 km/h									Not Applicable
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it	Average Signal Delay				≤ 10 sec			≤ 20 sec				≤ 30 sec		≤ 40 sec	≤ 20 sec	> 40 sec		≤ 20 sec	≤ 20 sec		≤ 40 sec
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Tran	Level of Service			В				с				D				F				E	
	Effective Corner Radius											< 10 m		< 10 m		< 10 m			10 - 15 m		< 10 m
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Ξ.		-	-	-	-	-	-	-	-	-	-	D	-	D	-	D	-	-	В	-	D
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Aut	Level of Service			Α				Α			E	В				С				С	



MMLOS Analysis



City of Ottawa

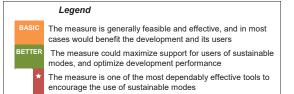
# **TDM Measures Checklist**

Version 1.0 (30 June 2017)

#### City of Ottawa

# **TDM Measures Checklist:**

Non-Residential Developments (office, institutional, retail or industrial)



	TDM	measures: Non-residential developments	Check if proposed & add descriptions
	1.	TDM PROGRAM MANAGEMENT	
	1.1	Program coordinator	
BASIC	1.1.1	Designate an internal coordinator, or contract with an external coordinator	
	1.2	Travel surveys	
BETTER	1.2.1	Conduct periodic surveys to identify travel-related behaviours, attitudes, challenges and solutions, and to track progress	
	2.	WALKING AND CYCLING	
	2.1	Information on walking/cycling routes & destin	ations
BASIC	2.1.1	Display local area maps with walking/cycling access routes and key destinations at major entrances	$\checkmark$
	2.2	Bicycle skills training	
		Commuter travel	
BETTER 🖌	2.2.1	Offer on-site cycling courses for commuters, or subsidize off-site courses	
	2.3	Valet bike parking	
		Visitor travel	
BETTER	2.3.1	Offer secure valet bike parking during public events when demand exceeds fixed supply (e.g. for festivals, concerts, games)	

	TDM	measures: Non-residential developments	Check if proposed & add descriptions
	3.	TRANSIT	
	3.1	Transit information	
BASIC	3.1.1	Display relevant transit schedules and route maps at entrances	$\checkmark$
BASIC	3.1.2	Provide online links to OC Transpo and STO information	
BETTER	3.1.3	Provide real-time arrival information display at entrances	
	3.2	Transit fare incentives	
		Commuter travel	
BETTER	3.2.1	Offer preloaded PRESTO cards to encourage commuters to use transit	
BETTER ★	3.2.2	Subsidize or reimburse monthly transit pass purchases by employees	
		Visitor travel	
BETTER	3.2.3	Arrange inclusion of same-day transit fare in price of tickets (e.g. for festivals, concerts, games)	
	3.3	Enhanced public transit service	
		Commuter travel	
BETTER	3.3.1	Contract with OC Transpo to provide enhanced transit services (e.g. for shift changes, weekends)	
		Visitor travel	·
BETTER	3.3.2	Contract with OC Transpo to provide enhanced transit services (e.g. for festivals, concerts, games)	
	3.4	Private transit service	
		Commuter travel	
BETTER	3.4.1	Provide shuttle service when OC Transpo cannot offer sufficient quality or capacity to serve demand (e.g. for shift changes, weekends)	
		Visitor travel	
BETTER	3.4.2	Provide shuttle service when OC Transpo cannot offer sufficient quality or capacity to serve demand (e.g. for festivals, concerts, games)	

City of Ottawa

	TDM	measures: Non-residential developments	Check if proposed & add descriptions
	4.	RIDESHARING	
	4.1	Ridematching service	
		Commuter travel	
BASIC ★	4.1.1	Provide a dedicated ridematching portal at OttawaRideMatch.com	
	4.2	Carpool parking price incentives	
		Commuter travel	
SETTER	4.2.1	Provide discounts on parking costs for registered carpools	
	4.3	Vanpool service	
		Commuter travel	
BETTER	4.3.1	Provide a vanpooling service for long-distance commuters	
	5.	CARSHARING & BIKESHARING	
	5.1	Bikeshare stations & memberships	
BETTER	5.1.1	Contract with provider to install on-site bikeshare station for use by commuters and visitors	
		Commuter travel	
BETTER	5.1.2	Provide employees with bikeshare memberships for local business travel	
	5.2	Carshare vehicles & memberships	
		Commuter travel	
BETTER	5.2.1	Contract with provider to install on-site carshare vehicles and promote their use by tenants	
BETTER	5.2.2	Provide employees with carshare memberships for local business travel	
	6.	PARKING	
	6.1	Priced parking	
		Commuter travel	
BASIC ★	6.1.1	Charge for long-term parking (daily, weekly, monthly)	$\square$
BASIC	6.1.2	Unbundle parking cost from lease rates at multi-tenant sites	$\checkmark$
		Visitor travel	
BETTER	6.1.3	Charge for short-term parking (hourly)	

# TDM Measures Checklist

Version 1.0 (30 June 2017)

	TDM	measures: Non-residential developments	Check if proposed & add descriptions
	7.	TDM MARKETING & COMMUNICATIONS	
	7.1	Multimodal travel information	
		Commuter travel	
BASIC 🛨	7.1.1	Provide a multimodal travel option information package to new/relocating employees and students	$\checkmark$
		Visitor travel	
ETTER ★	7.1.2	Include multimodal travel option information in invitations or advertising that attract visitors or customers (e.g. for festivals, concerts, games)	
	7.2	Personalized trip planning	
		Commuter travel	
ETTER ★	7.2.1	Offer personalized trip planning to new/relocating employees	
	7.3	Promotions	
		Commuter travel	
ETTER	7.3.1	Deliver promotions and incentives to maintain awareness, build understanding, and encourage trial of sustainable modes	
	8.	OTHER INCENTIVES & AMENITIES	
	8.1	Emergency ride home	
		Commuter travel	
ETTER ★	8.1.1	Provide emergency ride home service to non-driving commuters	
	8.2	Alternative work arrangements	
		Commuter travel	
BASIC ★	8.2.1	Encourage flexible work hours	
ETTER	8.2.2	Encourage compressed workweeks	
ETTER ★	8.2.3	Encourage telework	
	8.3	Local business travel options	
		Commuter travel	
BASIC ★	8.3.1	Provide local business travel options that minimize the need for employees to bring a personal car to work	
	8.4	Commuter incentives	
		Commuter travel	
ETTER	8.4.1	Offer employees a taxable, mode-neutral commuting allowance	
	8.5	On-site amenities	
		Commuter travel	
ETTER	8.5.1	Provide on-site amenities/services to minimize mid-day or mid-commute errands	

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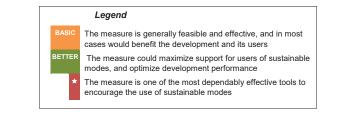
# **TDM Measures Checklist**

Version 1.0 (30 June 2017)

## City of Ottawa

# **TDM Measures Checklist:**

Residential Developments (multi-family, condominium or subdivision)



	TDM	measures: Residential developments	Check if proposed & add descriptions	
	1.	TDM PROGRAM MANAGEMENT		
	1.1	Program coordinator		
BASIC 🖈	1.1.1	Designate an internal coordinator, or contract with an external coordinator		
	1.2	Travel surveys		
BETTER	1.2.1	Conduct periodic surveys to identify travel-related behaviours, attitudes, challenges and solutions, and to track progress		
	2.	WALKING AND CYCLING		
	2.1	Information on walking/cycling routes & des	tinations	
BASIC	2.1.1	Display local area maps with walking/cycling access routes and key destinations at major entrances (multi-family, condominium)	$\checkmark$	
	2.2	Bicycle skills training		
BETTER	2.2.1	Offer on-site cycling courses for residents, or subsidize off-site courses		

	TDM	measures: Residential developments	Check if proposed & add descriptions
	3.	TRANSIT	
	3.1	Transit information	
BASIC	3.1.1	Display relevant transit schedules and route maps at entrances (multi-family, condominium)	$\checkmark$
BETTER	3.1.2	Provide real-time arrival information display at entrances ( <i>multi-family, condominium</i> )	
	3.2	Transit fare incentives	
BASIC ★	3.2.1	Offer PRESTO cards preloaded with one monthly transit pass on residence purchase/move-in, to encourage residents to use transit	$\nabla$
BETTER	3.2.2	Offer at least one year of free monthly transit passes on residence purchase/move-in	
	3.3	Enhanced public transit service	
BETTER ★	3.3.1	Contract with OC Transpo to provide early transit services until regular services are warranted by occupancy levels ( <i>subdivision</i> )	
	3.4	Private transit service	
BETTER	3.4.1	Provide shuttle service for seniors homes or lifestyle communities (e.g. scheduled mall or supermarket runs)	
	4.	CARSHARING & BIKESHARING	
	4.1	Bikeshare stations & memberships	
BETTER	4.1.1	Contract with provider to install on-site bikeshare station ( <i>multi-family</i> )	
BETTER	4.1.2	Provide residents with bikeshare memberships, either free or subsidized (multi-family)	
	4.2	Carshare vehicles & memberships	
BETTER	4.2.1	Contract with provider to install on-site carshare vehicles and promote their use by residents	
BETTER	4.2.2	Provide residents with carshare memberships, either free or subsidized	
	5.	PARKING	
	5.1	Priced parking	
BASIC ★	5.1.1	Unbundle parking cost from purchase price (condominium)	$\checkmark$
BASIC ★	5.1.2	Unbundle parking cost from monthly rent (multi-family)	$\checkmark$

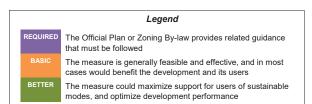
City of Ottawa

TDM measures: Residential developments			Check if proposed & add descriptions
	6.	TDM MARKETING & COMMUNICATION	S
	6.1	Multimodal travel information	
BASIC ★	6.1.1	Provide a multimodal travel option information package to new residents	$\checkmark$
	6.2	Personalized trip planning	
BETTER ★	6.2.1	Offer personalized trip planning to new residents	

TDM-Supportive Development Design and Infrastructure Checklist Version 1.0 (30 June 2017) City of Ottawa

# TDM-Supportive Development Design and Infrastructure Checklist:

Non-Residential Developments (office, institutional, retail or industrial)



	TDM-s	upportive design & infrastructure measures: Non-residential developments	Check if completed & add descriptions, explanations or plan/drawing references
	1.	WALKING & CYCLING: ROUTES	
	1.1	Building location & access points	
BASIC	1.1.1	Locate building close to the street, and do not locate parking areas between the street and building entrances	$\checkmark$
BASIC	1.1.2	Locate building entrances in order to minimize walking distances to sidewalks and transit stops/stations	$\triangleleft$
BASIC	1.1.3	Locate building doors and windows to ensure visibility of pedestrians from the building, for their security and comfort	
	1.2	Facilities for walking & cycling	
REQUIRED	1.2.1	Provide convenient, direct access to stations or major stops along rapid transit routes within 600 metres; minimize walking distances from buildings to rapid transit; provide pedestrian-friendly, weather-protected (where possible) environment between rapid transit accesses and building entrances; ensure quality linkages from sidewalks through building entrances to integrated stops/stations (see Official Plan policy 4.3.3)	
REQUIRED	1.2.2	Provide safe, direct and attractive pedestrian access from public sidewalks to building entrances through such measures as: reducing distances between public sidewalks and major building entrances; providing walkways from public streets to major building entrances; within a site, providing walkways along the front of adjoining buildings, between adjacent buildings, and connecting areas where people may congregate, such as courtyards and transit stops; and providing weather protection through canopies, colonnades, and other design elements wherever possible (see Official Plan policy 4.3.12)	

# TDM-Supportive Development Design and Infrastructure Checklist Version 1.0 (30 June 2017)

City of Ottawa

	TDM-s	upportive design & infrastructure measures: Non-residential developments	Check if completed & add descriptions, explanations or plan/drawing references
REQUIRED	1.2.3	Provide sidewalks of smooth, well-drained walking surfaces of contrasting materials or treatments to differentiate pedestrian areas from vehicle areas, and provide marked pedestrian crosswalks at intersection sidewalks (see Official Plan policy 4.3.10)	$\checkmark$
REQUIRED	1.2.4	Make sidewalks and open space areas easily accessible through features such as gradual grade transition, depressed curbs at street corners and convenient access to extra-wide parking spaces and ramps (see Official Plan policy 4.3.10)	$\checkmark$
REQUIRED	1.2.5	Include adequately spaced inter-block/street cycling and pedestrian connections to facilitate travel by active transportation. Provide links to the existing or planned network of public sidewalks, multi-use pathways and on- road cycle routes. Where public sidewalks and multi-use pathways intersect with roads, consider providing traffic control devices to give priority to cyclists and pedestrians (see Official Plan policy 4.3.11)	
BASIC	1.2.6	Provide safe, direct and attractive walking routes from building entrances to nearby transit stops	$\square$
BASIC	1.2.7	Ensure that walking routes to transit stops are secure, visible, lighted, shaded and wind-protected wherever possible	
BASIC	1.2.8	Design roads used for access or circulation by cyclists using a target operating speed of no more than 30 km/h, or provide a separated cycling facility	
	1.3	Amenities for walking & cycling	
BASIC	1.3.1	Provide lighting, landscaping and benches along walking and cycling routes between building entrances and streets, sidewalks and trails	
BASIC	1.3.2	Provide wayfinding signage for site access (where required, e.g. when multiple buildings or entrances exist) and egress (where warranted, such as when directions to reach transit stops/stations, trails or other common destinations are not obvious)	

# TDM-Supportive Development Design and Infrastructure Checklist Version 1.0 (30 June 2017)

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	TDM-s	upportive design & infrastructure measures: Non-residential developments	Check if completed & add descriptions, explanations or plan/drawing references
	2.	WALKING & CYCLING: END-OF-TRIP FACILI	TIES
	2.1	Bicycle parking	
EQUIRED	2.1.1	Provide bicycle parking in highly visible and lighted areas, sheltered from the weather wherever possible (see Official Plan policy 4.3.6)	$\checkmark$
EQUIRED	2.1.2	Provide the number of bicycle parking spaces specified for various land uses in different parts of Ottawa; provide convenient access to main entrances or well- used areas (see Zoning By-law Section 111)	<b>√</b>
EQUIRED	2.1.3	Ensure that bicycle parking spaces and access aisles meet minimum dimensions; that no more than 50% of spaces are vertical spaces; and that parking racks are securely anchored (see Zoning By-law Section 111)	$\checkmark$
BASIC	2.1.4	Provide bicycle parking spaces equivalent to the expected number of commuter cyclists (assuming the cycling mode share target is met), plus the expected peak number of customer/visitor cyclists	
BETTER	2.1.5	Provide bicycle parking spaces equivalent to the expected number of commuter and customer/visitor cyclists, plus an additional buffer (e.g. 25 percent extra) to encourage other cyclists and exputer adequate capacity in peak cycling season	
	2.2	Secure bicycle parking	
EQUIRED	2.2.1	Where more than 50 bicycle parking spaces are provided for a single office building, locate at least 25% of spaces within a building/structure, a secure area (e.g. supervised parking lot or enclosure) or bicycle lockers (see Zoning By-law Section 111)	
BETTER	2.2.2	Provide secure bicycle parking spaces equivalent to the expected number of commuter cyclists (assuming the cycling mode share target is met)	
	2.3	Shower & change facilities	
BASIC	2.3.1	Provide shower and change facilities for the use of active commuters	
BETTER	2.3.2	In addition to shower and change facilities, provide dedicated lockers, grooming stations, drying racks and laundry facilities for the use of active commuters	
	2.4	Bicycle repair station	
BETTER	2.4.1	Provide a permanent bike repair station, with commonly used tools and an air pump, adjacent to the main bicycle parking area (or secure bicycle parking area, if provided)	

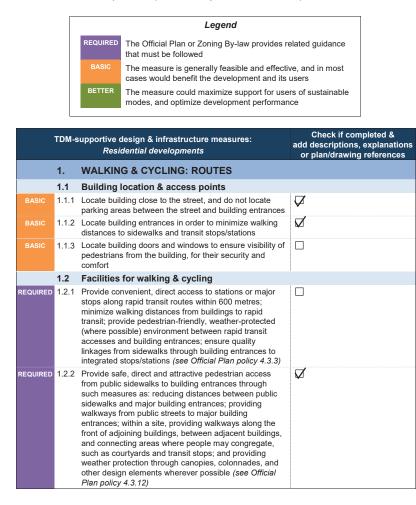
TDM-Supportive Development Design and Infrastructure Checklist Version 1.0 (30 June 2017)

Check if completed & TDM-supportive design & infrastructure measures: add descriptions, explanations Non-residential developments or plan/drawing references 3. TRANSIT 3.1 Customer amenities BASIC 3.1.1 Provide shelters, lighting and benches at any on-site transit stops 3.1.2 Where the site abuts an off-site transit stop and insufficient space exists for a transit shelter in the public right-of-way, protect land for a shelter and/or install a shelter BETTER 3.1.3 Provide a secure and comfortable interior waiting area by integrating any on-site transit stops into the building 4. **RIDESHARING** 4.1 Pick-up & drop-off facilities BASIC 4.1.1 Provide a designated area for carpool drivers (plus taxis and ride-hailing services) to drop off or pick up passengers without using fire lanes or other no-stopping zones 4.2 Carpool parking BASIC 4.2.1 Provide signed parking spaces for carpools in a priority location close to a major building entrance, sufficient in number to accommodate the mode share target for carpools BETTER 4.2.2 At large developments, provide spaces for carpools in a separate, access-controlled parking area to simplify enforcement 5. CARSHARING & BIKESHARING 5.1 Carshare parking spaces BETTER 5.1.1 Provide carshare parking spaces in permitted non-residential zones, occupying either required or provided parking spaces (see Zoning By-law Section 94) 5.2 Bikeshare station location BETTER 5.2.1 Provide a designated bikeshare station area near a major building entrance, preferably lighted and sheltered with a direct walkway connection

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TDM-s	upportive design & infrastructure measures: Non-residential developments	Check if completed & add descriptions, explanations or plan/drawing references
6.	PARKING	
6.1	Number of parking spaces	
6.1.1	Do not provide more parking than permitted by zoning, nor less than required by zoning, unless a variance is being applied for	$\checkmark$
6.1.2	Provide parking for long-term and short-term users that is consistent with mode share targets, considering the potential for visitors to use off-site public parking	
6.1.3	Where a site features more than one use, provide shared parking and reduce the cumulative number of parking spaces accordingly (see Zoning By-law Section 104)	
6.1.4	Reduce the minimum number of parking spaces required by zoning by one space for each 13 square metres of gross floor area provided as shower rooms, change rooms, locker rooms and other facilities for cyclists in conjunction with bicycle parking (see Zoning By-law Section 111)	
6.2	Separate long-term & short-term parking areas	
6.2.1	Separate short-term and long-term parking areas using signage or physical barriers, to permit access controls and simplify enforcement (i.e. to discourage employees from parking in visitor spaces, and vice versa)	
7.	OTHER	
7.1	On-site amenities to minimize off-site trips	
7.1.1	Provide on-site amenities to minimize mid-day or mid-commute errands	
	6. 6.1 6.1.2 6.1.3 6.1.3 6.1.4 6.2.1 7. 7.	<ul> <li>6. PARKING</li> <li>6. Number of parking spaces</li> <li>6.1 Number of parking spaces</li> <li>6.1.1 Do not provide more parking than permitted by zoning, nor less than required by zoning, unless a variance is being applied for</li> <li>6.1.2 Provide parking for long-term and short-term users that is consistent with mode share targets, considering the potential for visitors to use off-site public parking</li> <li>6.1.3 Where a site features more than one use, provide shared parking and reduce the cumulative number of parking spaces accordingly (see Zoning By-law Section 104)</li> <li>6.1.4 Reduce the minimum number of parking spaces required by zoning by one space for each 13 square metres of gross floor area provided as shower rooms, change rooms, locker rooms and other facilities for cyclists in conjunction with bicycle parking areas</li> <li>6.2 Separate long-term &amp; short-term parking areas</li> <li>6.2 Separate long-term &amp; short cerm parking areas using signage or physical barriers, to permit access controls and simplify enforcement (i.e. to discourage employees from parking in visitor spaces, and vice versa)</li> <li>7. OTHER</li> <li>7.1 On-site amenities to minimize off-site trips</li> <li>7.1.1 Provide on-site amenities to minimize mid-day or</li> </ul>

## **TDM-Supportive Development Design and Infrastructure Checklist:** *Residential Developments (multi-family or condominium)*



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	TDM-s	supportive design & infrastructure measures: Residential developments	Check if completed & add descriptions, explanations or plan/drawing references
REQUIRED	1.2.3	Provide sidewalks of smooth, well-drained walking surfaces of contrasting materials or treatments to differentiate pedestrian areas from vehicle areas, and provide marked pedestrian crosswalks at intersection sidewalks (see Official Plan policy 4.3.10)	$\checkmark$
REQUIRED	1.2.4	Make sidewalks and open space areas easily accessible through features such as gradual grade transition, depressed curbs at street corners and convenient access to extra-wide parking spaces and ramps (see Official Plan policy 4.3.10)	$\checkmark$
REQUIRED	1.2.5	Include adequately spaced inter-block/street cycling and pedestrian connections to facilitate travel by active transportation. Provide links to the existing or planned network of public sidewalks, multi-use pathways and on-road cycle routes. Where public sidewalks and multi-use pathways intersect with roads, consider providing traffic control devices to give priority to cyclists and pedestrians (see Official Plan policy 4.3.11)	
BASIC	1.2.6	Provide safe, direct and attractive walking routes from building entrances to nearby transit stops	$\triangleleft$
BASIC	1.2.7	Ensure that walking routes to transit stops are secure, visible, lighted, shaded and wind-protected wherever possible	
BASIC	1.2.8	Design roads used for access or circulation by cyclists using a target operating speed of no more than 30 km/h, or provide a separated cycling facility	
	1.3	Amenities for walking & cycling	
BASIC	1.3.1	Provide lighting, landscaping and benches along walking and cycling routes between building entrances and streets, sidewalks and trails	
BASIC	1.3.2	Provide wayfinding signage for site access (where required, e.g. when multiple buildings or entrances exist) and egress (where warranted, such as when directions to reach transit stops/stations, trails or other common destinations are not obvious)	

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	TDM-s	upportive design & infrastructure measures: Residential developments	Check if completed & add descriptions, explanations or plan/drawing references
	2.	WALKING & CYCLING: END-OF-TRIP FACILI	TIES
	2.1	Bicycle parking	
REQUIRED	2.1.1	Provide bicycle parking in highly visible and lighted areas, sheltered from the weather wherever possible (see Official Plan policy 4.3.6)	$\checkmark$
REQUIRED	2.1.2	Provide the number of bicycle parking spaces specified for various land uses in different parts of Ottawa; provide convenient access to main entrances or well- used areas (see Zoning By-law Section 111)	$\triangleleft$
REQUIRED	2.1.3	Ensure that bicycle parking spaces and access aisles meet minimum dimensions; that no more than 50% of spaces are vertical spaces; and that parking racks are securely anchored (see Zoning By-law Section 111)	$\overline{\Delta}$
BASIC	2.1.4	Provide bicycle parking spaces equivalent to the expected number of resident-owned bicycles, plus the expected peak number of visitor cyclists	
	2.2	Secure bicycle parking	
REQUIRED	2.2.1	Where more than 50 bicycle parking spaces are provided for a single residential building, locate at least 25% of spaces within a building/structure, a secure area (e.g. supervised parking lot or enclosure) or bicycle lockers (see Zoning By-law Section 111)	
BETTER	2.2.2	Provide secure bicycle parking spaces equivalent to at least the number of units at condominiums or multi-family residential developments	
	2.3	Bicycle repair station	
BETTER	2.3.1	Provide a permanent bike repair station, with commonly used tools and an air pump, adjacent to the main bicycle parking area (or secure bicycle parking area, if provided)	
	3.	TRANSIT	
	3.1	Customer amenities	
BASIC	3.1.1	Provide shelters, lighting and benches at any on-site transit stops	
BASIC	3.1.2	Where the site abuts an off-site transit stop and insufficient space exists for a transit shelter in the public right-of-way, protect land for a shelter and/or install a shelter	
BETTER	3.1.3	Provide a secure and comfortable interior waiting area by integrating any on-site transit stops into the building	

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	TDM-s	upportive design & infrastructure measures: Residential developments	Check if completed & add descriptions, explanations or plan/drawing references
	4.	RIDESHARING	
	4.1	Pick-up & drop-off facilities	
BASIC	4.1.1	Provide a designated area for carpool drivers (plus taxis and ride-hailing services) to drop off or pick up passengers without using fire lanes or other no-stopping zones	$\checkmark$
	5.	CARSHARING & BIKESHARING	
	5.1	Carshare parking spaces	
BETTER	5.1.1	Provide up to three carshare parking spaces in an R3, R4 or R5 Zone for specified residential uses (see Zoning By-law Section 94)	
	5.2	Bikeshare station location	
BETTER	5.2.1	Provide a designated bikeshare station area near a major building entrance, preferably lighted and sheltered with a direct walkway connection	
	6.	PARKING	
	6.1	Number of parking spaces	
REQUIRED	6.1.1	Do not provide more parking than permitted by zoning, nor less than required by zoning, unless a variance is being applied for	$\bigtriangledown$
BASIC	6.1.2	Provide parking for long-term and short-term users that is consistent with mode share targets, considering the potential for visitors to use off-site public parking	
BASIC	6.1.3	Where a site features more than one use, provide shared parking and reduce the cumulative number of parking spaces accordingly (see Zoning By-law Section 104)	
BETTER	6.1.4	Reduce the minimum number of parking spaces required by zoning by one space for each 13 square metres of gross floor area provided as shower rooms, change rooms, locker rooms and other facilities for cyclists in conjunction with bicycle parking (see Zoning By-law Section 111)	
	6.2	Separate long-term & short-term parking areas	
BETTER	6.2.1	Provide separate areas for short-term and long-term parking (using signage or physical barriers) to permit access controls and simplify enforcement (i.e. to discourage residents from parking in visitor spaces, and vice versa)	