

# Centron Real Estate and Development

Final Report

Clearwater Park TIA

November 2021

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Alexander Ho, P.Eng., PTOE



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### **1.0** Study Overview

### 1.1 Introduction

ISL was retained by Centron Real Estate and Development to undertake a Transportation Impact Assessment (TIA) for the Clearwater Park Area Structure Plan (ASP). The full build-out area of the Clearwater Park ASP is bound by Township Road 243 to the north, Highway 791 to the east, and Highway 1 to the south and west. The location of the ASP is outlined in Figure 1.1 below.

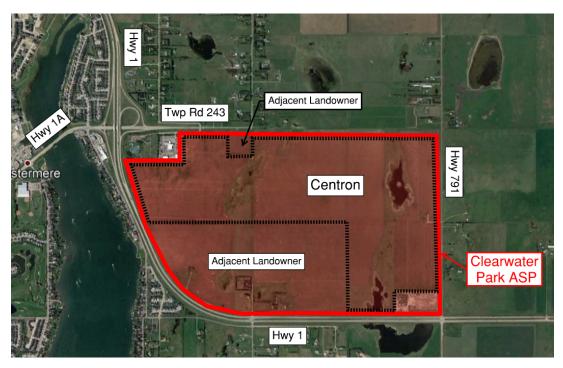


Figure 1.1: Clearwater Park TIA Study Area

The ASP is proposed to be built in 3 build-out stages; the details of the 3 stages are summarized below and shown in Figure 1.2.

- 2023 Build-Out: Stage 1 Phase 1
- 2028 Build-Out: Stage 1 Phases 1+2 / Stage 2
- 2039 Build-Out: Stage 1 Phases 1+2+3 / Stage 2 / Stage 3

The primary purpose of this TIA is to determine the transportation infrastructure required to accommodate the anticipated development the Phase 1 / 2023 Build-Out. As per the TIA scoping by the City of Chestermere, the analysis of the 2028 and 2039 Build-Outs will be undertaken at a later time in conjunction with the applications for those respective build-out areas.

The proposed land uses of the 2023 Build-Out of Clearwater Park is summarized in Table 1.1.



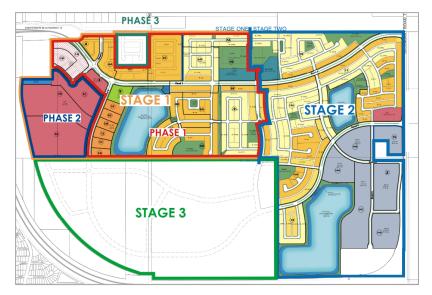


Figure 1.2: Stage and Phase Boundaries

Table 1.1: 2023 Horizon Proposed Build-Out

Stage 1 Phase 1 - Horizon Year: 2023							
Owner		Land Use	#	Unit			
		Retail	15,600	Sq. Ft			
	Commercial	Gas Station	12	Pumps			
		Drive Thru Restaurant	3,000	Sq. Ft			
Centron	Multi Family		958	Units			
Centron	Single Family	Single Family		Units			
	Senior Housing	Senior Housing		Units			
	School (Element	School (Elementary)		Students			
	Light Industrial 8	Warehouse	65,000	Sq. Ft			

### 1.2 Study Methodology

ISL undertook the following methodology, and several adjustments were made after the writing of the original scope. The original scope of work is attached in Appendix A.

- · Review background information in the study area;
- Obtain 2018 traffic count estimates at the intersections of Hwy 1 / Hwy 791, Hwy 1 / Hwy 1A, Hwy 1A / East Chestermere Dr, and Hwy 1A / West Chestermere Dr from the AT website;
- Estimate the 5-year (2023) background traffic volumes by applying a growth rate (calculated from the traffic volume history on the AT website) to the 2018 traffic data;
- Generate the 2023 Build-Out trips using the ITE Trip Generation Manual, 10th Edition; distribute trips using the travel patterns of the 2018 traffic counts;
- Add the generated 2023 Build-Out traffic to the 2023 background traffic;
- Analyze the following scenarios at the 2023 horizon:
  - Scenario 1: 2023 background network
  - Scenario 2: 2023 background network with 2023 Build-Out

- Note: It is anticipated two (2) options will be evaluated in Scenario 2: Option 1) existing unsignalized Hwy 1
   / Hwy 1A interchange junctions, Option 2) With added signal and dual SBL turn at Hwy 1 / Hwy 1A west junction
- Analyze the following intersections at the 2023 horizon:
  - Hwy 1A / West Chestermere Dr
  - Hwy 1A / East Chestermere Dr
  - Hwy 1 / Hwy 1A
  - Major internal intersections
- Determine, from the analysis, the infrastructure requirements and any needed upgrades for the analyzed intersections;



### **2.0** Traffic Derivation

### 2.1 Background Trips

#### 2.1.1 Existing Background

Existing 100th Highest Hour AM and PM peak hour traffic count estimates for the following intersections were obtained from Alberta Transportation's Traffic Mapping website:

- Highway 1A / West Chestermere Drive
- · Highway 1A / East Chestermere Drive
- Highway 1 / Highway 1A
- Highway 1 / Highway 791

All counts are from 2018, and are shown in Appendix B.

Per Alberta Transportation's Highway Geometric Design Guide, Section A.4.3 outlines the methodology to calculate traffic growth rates along segments of highway. Historical traffic data obtained from Alberta Transportation was used to calculate the growth rate along Highway 1 between the intersections of Paradise Road and Highway 791. Using data from 2009 to 2018, a growth rate of 0.93% was calculated. Section A.4.3 recommends that if the calculated growth rate is less than 2%, a conservative 2.0% growth rate should be used instead; in this TIA, a 2.0% growth rate is used.

#### 2.1.2 2023 Background

2023 Background trips were based on existing traffic counts with a 2.0% linear growth rate applied. The growth rate was applied to all turning movements at all intersections and represents the overall growth of Chestermere in the background scenario. The background traffic volumes are provided in Exhibit 2.1.

### 2.2 Trip Generation

The generated trips of Clearwater Park were based on trip generation rates / equations from the ITE Trip Generation Manual, 10th Edition. The trip generation rates / equations were confirmed with Alberta Transportation in the Scope of Work in Appendix A. Table 2.1 summarizes the trip generation rates for each land use. It is noted that the equation rate was used for both the light industrial and warehouse land uses.

Table 2.1: Trip Generation Rates for Clearwater Park

Use	Source	AM Peak			PM Peak			
USE	Source	Rate	In%	Out%	Rate	In%	Out%	
Commercial	ITE 820	0.94	62%	38%	3.81	48%	52%	
Multi Family	ITE 221	0.36	26%	74%	0.44	61%	39%	
Single Family	ITE 210	0.74	25%	75%	0.99	63%	37%	
Light Industrial	ITE 110 (Eq)	EQ	88%	12%	EQ	13%	87%	
Warehouse	ITE 150 (Eq)	EQ	77%	23%	EQ	27%	73%	
Senior Housing	ITE 252	0.20	35%	65%	0.26	55%	45%	
Restaurant with Drive-Thru	ITE 934	40.19	51%	49%	32.67	52%	48%	
Gas Station	ITE 945	12.47	51%	49%	13.99	51%	49%	
School (Elementary)*	ITE 520	0.67	54%	46%	0.17	48%	52%	

Note: 50% of the students from the elementary school was assumed to remain within Clearwater Park, and no external traffic was generated for these students.

### 2.3 Internal Trips / Pass-By Trips / Mode Split

#### 2.3.1 2023 Horizon Trips

The generated trips from the plan in the 2023 horizon are shown in Table 2.2 below. A 10% internal trip rate reduction was applied to all trips, except for the school; no mode split, or pass-by trip reduction was applied. For the school, only external trips were generated for 50% of the students; the remaining 50% of the students were assumed to remain within Clearwater Park and no external traffic was generated for these students. Trips generated are from Stage 1 Phase 1 of Clearwater Park only.

Table 2.2: 2023 Build-Out Generated Trips for Clearwater Park

Stage 1 Phase 1	AM			PM		
Land Use	Total Trips	In	Out	Total Trips	In	Out
Commercial	13	8	5	54	26	28
Gas Station	135	69	66	151	77	74
Drive Thru Restaurant	109	55	53	88	46	42
Multi Family	311	81	230	379	231	148
Single Family	222	56	167	298	187	110
Senior Housing	79	28	51	103	57	46
School (Elementary)*	90	49	42	23	11	12
Light Industrial & Warehouse	44	36	8	44	11	34
Total	1,014	386	627	1,142	647	496

Note: 50% of the students from the elementary school was assumed to remain within Clearwater Park, and no external traffic was generated for these students.



#### 2.4 2023 Build-Out Trip Distribution / Final Traffic

Trip distribution values for the 2023 horizon were calculated based on existing travel patterns. The distribution percentages used in this study are shown in Table 2.3 below. It is noted that in 2023, there is no connection to Highway 791, thus site generated trips traveling to/from Highway 1 east were assigned to the Highway 1 / Highway 1A interchange. It is noted that these vehicles were assigned as EBT and WBT traffic respectively at the Highway 1 / Highway 791 intersection.

Table 2.3: 2023 Horizon Trip Distribution

Origin / Destination	AM	PM
Highway 1A West	27%	20%
Highway 1 West	45%	44%
Highway 1 East	28%	36%
Total	100%	100%

Trips generated for the 2023 horizon were combined with trip distribution values in Table 2.3 to determine final traffic volumes for the 2023 horizon, shown in Exhibit 2.2.

Note: The 2023 volumes in Exhibit 2.2 are based on a previous version of the 2023 Build-Out site plan. In comparison, the land use generated 10% more traffic than the previous plan. Per the meeting with the City on May 18, 2021, a 10-15% increase in trips was considered acceptable, thus no update to the 2023 Build-Out exhibits and analysis was required.

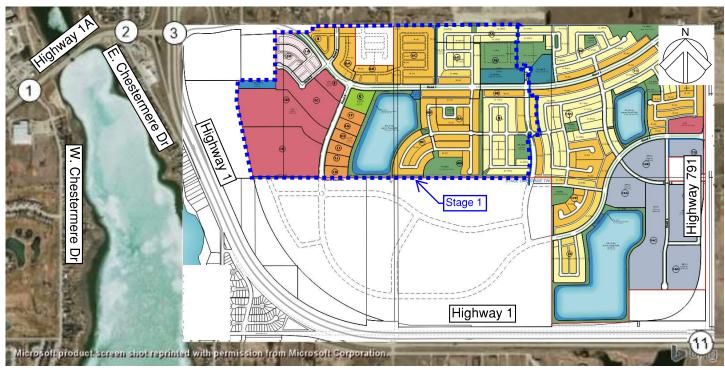
#### 2.5 2028 and 2039 Build-Out

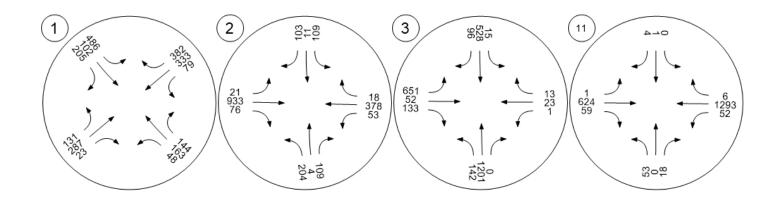
The traffic volume generation and analyses of the 2028 and 2039 Build-Out will be undertaken at the time of the application of these two build-out stages.

Additional policies to the Municipal Development Plan (MDP) and Area Structure Plan (ASP) were added to ensure that a TIA update will be undertaken. The policies had been accepted by City Administration and Clearwater Park has been permitted to move forward with the MDP and ASP application. The additional policies for the MDP and ASP are as follows:

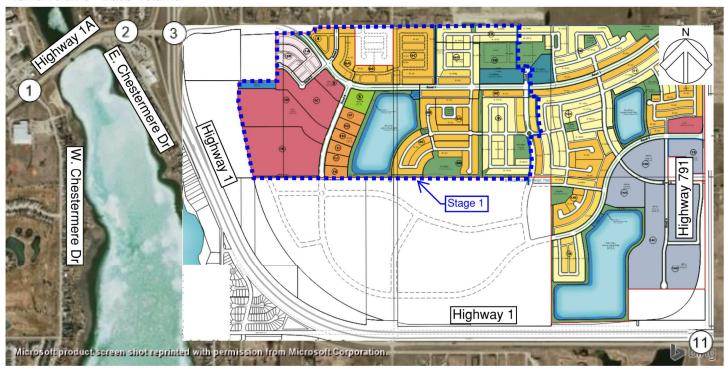
- Section 4.3.1 General Transportation Policy (Page 56) of MDP:
  - 4.3.1.8: Any proposed roadway intersection with Highway 791 / Range Road 280 shall require an updated
    Transportation Impact Assessment. The Transportation Impact Assessment shall consider, but not be
    limited to, the continued viability of the Highway 791 / 1 intersection. The Transportation Impact
    Assessment shall be reviewed and approved by the City of Chestermere and Alberta Transportation.
- Section 6.0 Transportation (page 38) of the ASP
  - All financing and cost sharing for Transportation Improvements required for the ASP shall be negotiated and reviewed by the City of Chestermere prior to Outline Plan. All improvements associated with the Provincial highways shall be reviewed and approved by Alberta Transportation.

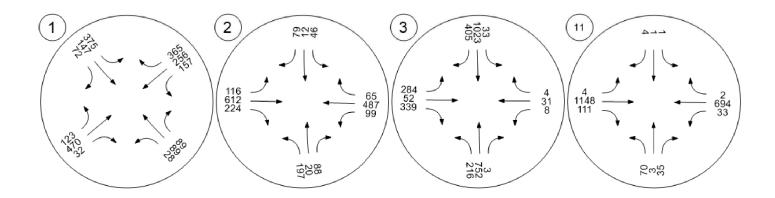
### Traffic Volume - Base Volume



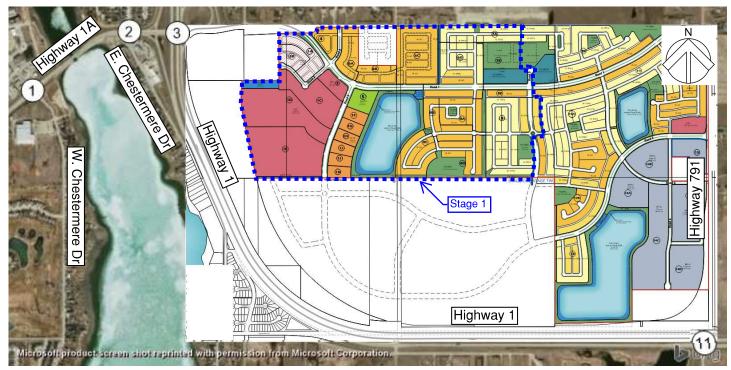


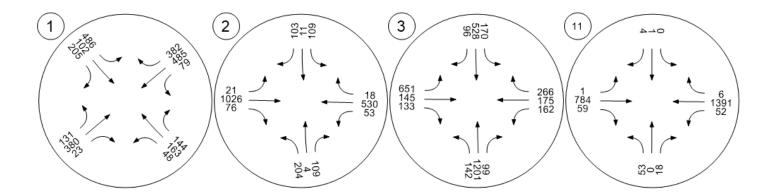
### Traffic Volume - Base Volume



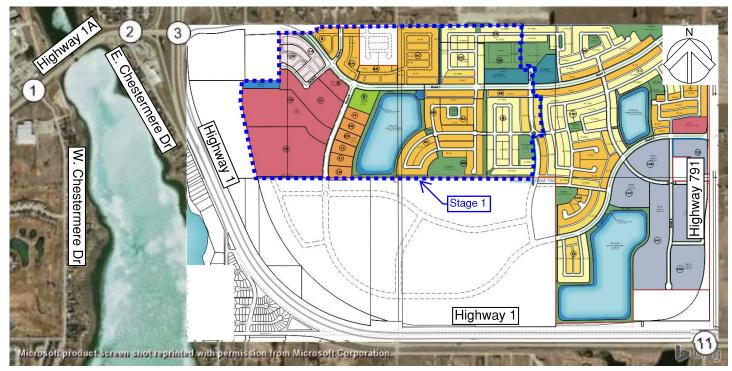


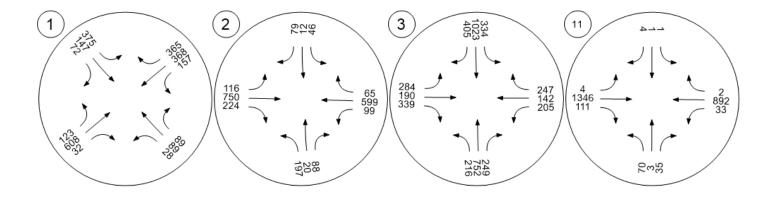
### Traffic Volume - Future Total Volume





### Traffic Volume - Future Total Volume





### ■ 3.0 Traffic Analysis

### 3.1 Synchro Analysis

The Synchro 9.2 computer analysis package was used to analyze the operational characteristics of the intersections. A Level of Operating Service (LOS) A represents the highest level of service or generally "free flowing conditions" while a LOS F generally represents a "breakdown" or "gridlock" condition in vehicular flow. There are varying degrees of delay and congestion introduced at the intersection LOS B, C, D, and E levels. LOS D is representative of "normal" peak hour congestion, while LOS E is representation of an intersection nearing its capacity. Typically, LOS E or better is the accepted standard for peak hour operations in urban areas, with LOS F accepted where limited to certain movements. From the Alberta Transportation Highway Geometric Design Guide's (HGDG) Table A-6-1a, the maximum tolerable LOS target for a Level 4 highway in a rural or urban context is LOS D. For a Level 1 highway in a rural context, LOS B is the target LOS. LOS criteria for intersections are based on average delay per vehicle and are existing operations is summarized in Table 3.1 below.

Synchro also calculates each movement's volume to capacity ratio (v/c). A v/c ratio of 1.0 represents an intersection or movement at full capacity with no ability to facilitate extra vehicles. Typically, a v/c ratio of 0.90 or better for all intersection movements is the accepted standard for peak hour operations in urban areas, with v/c 1.0 accepted where limited to certain movements.

Finally, Synchro also calculates the 95th percentile vehicle queue length for each intersection movement, which provides the criteria for left and right turn storage requirements. This queue length is exceeded 5% of the time, which is accepted practice for normal peak hour operation.

### 3.2 Existing Traffic

Existing traffic counts obtained from Alberta Transportation were analyzed using existing lane configurations. Synchro results for existing operations are shown in Table 3.1 below.

The current lane configurations are as follows and are shown in Exhibit 3.1:

- Highway 1A / West Chestermere Drive: Signalized intersection with two core lanes, with auxiliary turning lanes on the eastbound and westbound movements. Dedicated NBL and SBL with shared through-rights on both the north and south legs.
- Highway 1A / East Chestermere Drive: Signalized intersection with four core lanes, with auxiliary turning lanes
  on the eastbound and westbound movements. Dedicated NBL and SBR with shared thru-rights on the south
  leg and shared thru-left on the north leg.
- Highway 1A / Highway 1 West Junction: Stop controlled intersection with four core lanes. Channelized EBR, and SBR, with a dedicated WBL turning lane.
- Highway 1A / Highway 1 East Junction: Stop controlled intersection with four core lanes. Channelized WBR, with a dedicated EBL turning lane.
- Highway 1 / Highway 791: Stop controlled intersection with four core lanes. Dedicated EBL, EBR, and WBL turning lanes.

The existing traffic volumes were analyzed with the current lane configurations. The detailed Synchro results are summarized in Table 3.1 and shown in Appendix C. From the analyses, all movements operate within accepted guidelines.



Table 3.1: Existing Synchro Results

Intersection			AM Pe		PM Peak		
Name	Movement	v/c Ratio	LOS	Queue 95th (m)	v/c Ratio	LOS	Queue 95th (m)
	EBL	0.50	С	29	0.25	В	19
	EBT	0.50	С	49	0.59	В	66
	EBR	0.04	Α	0	0.04	Α	0
	WBL	0.26	С	17	0.52	С	30
Hwy 1A /	WBT	0.57	С	58	0.32	В	34
W Chestermere Dr (Signalized)	WBR	0.51	Α	17	0.41	Α	13
,	NBL	0.21	С	12	0.11	С	8
	NBT/R	0.71	С	48	0.43	В	26
	SBL	0.80	С	66	0.65	В	49
	SBT/R	0.32	Α	16	0.30	В	26
	EBL	0.04	Α	4	0.22	Α	15
	EBT/T	0.54	В	51	0.29	Α	29
	EBR	0.09	Α	6	0.22	Α	9
	WBL	0.22	В	10	0.21	Α	14
Hwy 1A / E Chestermere Dr	WBT/T	0.22	Α	19	0.23	Α	23
(Signalized)	WBR	0.02	Α	1	0.07	Α	5
,	NBL	0.57	С	31	0.51	В	29
	NBT/R	0.22	Α	11	0.20	Α	9
	SBL/T	0.34	В	19	0.16	В	10
	SBR	0.20	Α	8	0.16	Α	7
	EBT/T/R	0.27	Α	0	0.25	Α	0
Hwy 1A / Hwy 1	WBL	0.00	Α	0	0.01	Α	0
West Junction	WBT/T	0.05	Α	0	0.07	Α	0
(Stop Control)	SBL	0.10	Α	2	0.42	В	16
	SBR	0.10	Α	2	0.42	В	16
Hwy 1A / Hwy 1	EBL	0.40	Α	15	0.14	Α	5
East Junction	EBT/T	0.02	Α	0	0.02	Α	0
(Stop Control)	WBT/T/R	0.01	Α	0	0.01	Α	0
	EBL	0.00	В	0	0.00	Α	0
	EBT/T	0.18	Α	0	0.32	Α	0
4/// 70:	EBR	0.03	Α	0	0.06	Α	0
Hwy 1 / Hwy 791 (Stop Control)	WBL	0.05	Α	1	0.06	В	1
( 1 2 )	WBT/T/R	0.49	Α	0	0.26	Α	0
	NBL/T/R	0.19	С	5	0.39	D	13
	SBL/T/R	0.01	С	0	0.01	В	0

#### 3.3 2023 Horizon

### 3.3.1 2023 Background

For the 2023 horizon, the existing 2018 Background traffic was grown at a linear rate of 2% for 5 years. The existing dedicated NBL and shared through/right lane at the intersection of Highway 1A / West Chestermere Drive was changed to a shared through/left lane and dedicated NBR lane. This adjustment was made to accommodate the higher right turning volumes at the intersection.

No other changes were made to the network for this scenario. Synchro results for 2023 Background is summarized in Table 3.2 below and shown in Appendix C. All intersections operate within guidelines.

Table 3.2: 2023 Background Synchro Results

Intersection				PM Peak			
Name	Movement	v/c Ratio	LOS	Queue 95th (m)	v/c Ratio	LOS	Queue 95 <sup>th</sup> (m)
	EBL	0.42	В	25	0.27	В	23
	EBT	0.56	С	68	0.90	D	134
	EBR	0.04	Α	0	0.06	Α	0
Hwy 1A /	WBL	0.21	В	16	0.62	С	33
West Chestermere	WBT	0.71	D	81	0.45	С	58
Drive	WBR	0.56	Α	20	0.50	Α	19
(Signalized)	NBL/T	0.77	D	63	0.50	D	33
	NBR	0.36	Α	14	0.28	Α	9
	SBL	0.86	С	97	0.62	В	61
	SBT/R	0.38	Α	32	0.30	В	32
	EBL	0.05	Α	4	0.29	В	18
	EBT/T	0.59	В	55	0.38	Α	34
	EBR	0.10	Α	5	0.27	Α	9
Hwy 1A /	WBL	0.27	В	11	0.29	В	16
East	WBT/T	0.24	Α	20	0.30	Α	26
Chestermere Drive	WBR	0.02	Α	1	0.08	Α	5
(Signalized)	NBL	0.61	С	36	0.56	С	32
	NBT/R	0.24	Α	13	0.22	Α	10
	SBL/T	0.36	В	22	0.16	В	11
	SBR	0.21	Α	8	0.17	Α	7
	EBT/T	0.22	Α	0	0.10	Α	0
Hwy 1A /	EBR	0.08	Α	0	0.21	Α	0
Hwy 1 West	WBL	0.00	Α	0	0.01	Α	0
Junction (Stop	WBT/T	0.05	Α	0	0.08	Α	0
Control)	SBL	0.11	Α	3	0.47	В	20
	SBR	0.11	Α	3	0.47	В	20
Hwy 1A /	EBL	0.44	Α	17	0.19	Α	5
Hwy 1 East Junction	EBT/T	0.02	Α	0	0.03	Α	0
(Stop Control)	WBT/T/R	0.01	Α	0	0.02	Α	0



Intersection		AM Peak			PM Peak		
Name	Movement	v/c Ratio	LOS	Queue 95th (m)	v/c Ratio	LOS	Queue 95 <sup>th</sup> (m)
	EBL	0.00	Α	0	0.00	Α	0
	EBT/T	0.20	Α	0	0.36	Α	0
Hwy 1 / Hwy	EBR	0.04	Α	0	0.07	Α	0
791 (Stop Control)	WBL	0.06	Α	2	0.07	В	2
	WBT/T/R	0.54	Α	0	0.29	Α	0
	NBL/T/R	0.22	С	6	0.49	D	19
	SBL/T/R	0.02	С	0	0.02	В	0

#### 3.3.2 2023 Background + Development

In this scenario, the generated trips of the 2023 Build-Out were added to the 2023 background volumes.

Intersection upgrades at Highway 1A / Highway 1 West Junction are necessary due to the increased SBL traffic travelling to Clearwater Park, particularly during the AM Peak. Synchro results for existing configuration exceeds thresholds, thus signalization and a dual SBL left are recommended.

The 2023 recommended lane configuration is provided in Exhibit 3.2. The Synchro results of the 2023 Background + Development scenario are summarized in Table 3.3 below and shown in Appendix C.

Note: The analysis relates to the previous version of the site plan. As noted in Section 2.4, the change in generated traffic of the latest site plan were considered within acceptable range, thus no update to the analysis was warranted.

Table 3.3: 2023 Background + Development Synchro Results

Intersection		AM Peak			PM Peak		
Name	Movement	v/c Ratio	LOS	Queue 95 <sup>th</sup> (m)	v/c Ratio	LOS	Queue 95 <sup>th</sup> (m)
	EBL	0.64	D	35	0.30	В	22
	EBT	0.63	D	112	0.89	D	166
	EBR	0.04	Α	0	0.05	Α	0
,	WBL	0.26	С	20	0.74	С	44
Hwy 1A /	WBT	0.87	D	151	0.54	С	85
W Chestermere Dr (Signalized)	WBR	0.52	Α	20	0.45	Α	17
(Olgridiized)	NBL/T	0.83	Е	88	0.17	D	14
	NBR	0.38	Α	17	0.67	D	53
	SBL	0.84	С	138	0.79	D	95
	SBT/R	0.38	В	52	0.33	С	51
	EBL	0.05	Α	4	0.28	В	18
	EBT/T	0.63	В	61	0.40	Α	40
	EBR	0.10	Α	5	0.24	Α	9
Hwy 1A /	WBL	0.30	В	11	0.30	В	17
E Chestermere Dr	WBT/T	0.32	Α	28	0.32	Α	31
(Signalized)	WBR	0.02	Α	2	0.07	Α	5
	NBL	0.60	С	36	0.54	В	27
	NBT/R	0.24	Α	14	0.22	Α	9
	SBL/T	0.36	В	22	0.16	В	9

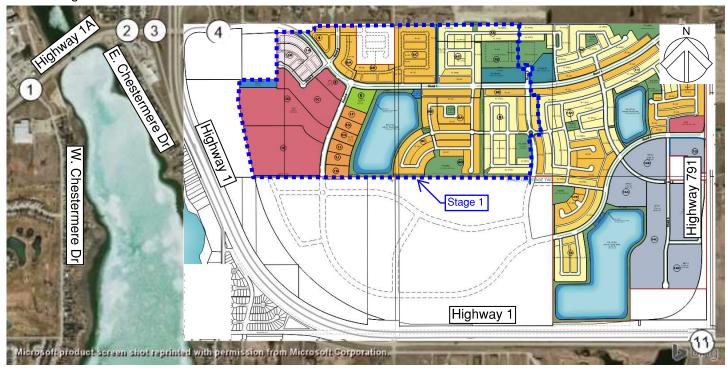
Intersection		AM Peak			PM Peak		
Name	Movement	v/c Ratio	LOS	Queue 95 <sup>th</sup> (m)	v/c Ratio	LOS	Queue 95 <sup>th</sup> (m)
	SBR	0.21	Α	8	0.16	Α	6
	EBT/T	0.47	В	47	0.38	В	31
	EBR	0.16	Α	8	0.44	Α	14
Hwy 1A / Hwy 1 West Junction	WBL	0.32	Α	9	0.36	Α	18
(Signalized)	WBT/T	0.14	Α	10	0.19	Α	15
(Orginalizou)	SBL/L	0.25	В	14	0.48	С	25
	SBR	0.24	Α	9	0.63	Α	18
Hwy 1A / Hwy 1	EBL	0.58	В	30	0.25	Α	8
East Junction	EBT/T	0.10	Α	0	0.16	Α	0
(Stop Control)	WBT/T/R	0.24	Α	0	0.22	Α	0
	EBL	0.00	В	0	0.01	Α	0
	EBT/T	0.25	Α	0	0.42	Α	0
Hwy 1 / Hwy 791 (Stop Control)	EBR	0.04	Α	0	0.07	Α	0
	WBL	0.07	В	2	0.08	В	2
	WBT/T/R	0.58	Α	0	0.37	Α	0
	NBL/T/R	0.26	С	8	0.65	F	28
	SBL/T/R	0.02	С	0	0.02	С	1

From Table 3.3, all movements operate within guidelines with the exception of the northbound Highway 791 movement at Highway 1 / Highway 791. As outlined in Section 2.4, there is no traffic from Clearwater Park traveling to or added on Highway 791 as there is no connectivity within the subject lands to Highway 791; only eastbound and westbound through traffic is added onto Highway 1. A signal warrant analysis was completed (see Section 4.1) to determine the need for signalization of the intersection, which concluded that the signal is not warranted. We also note that, while the delays are at LOS F, the volume to capacity ratio and traffic queues are not critical at this location.

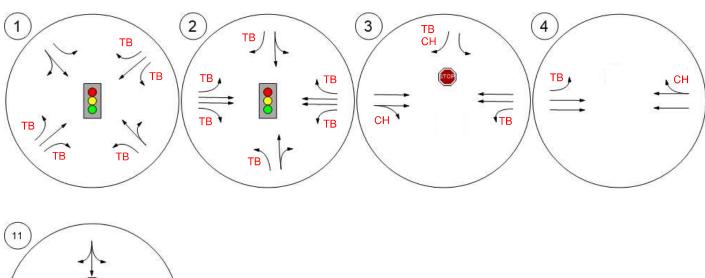
#### 3.4 2028 and 2039 Build-Out

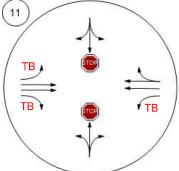
The analyses of the 2028 and 2039 Build-Out will be undertaken at the time of the application of these two build-out stages. Additional policies have been added to the MDP and ASP (see Section 2.4) to ensure that a TIA update will be undertaken.

# Lane Configuration and Traffic Control

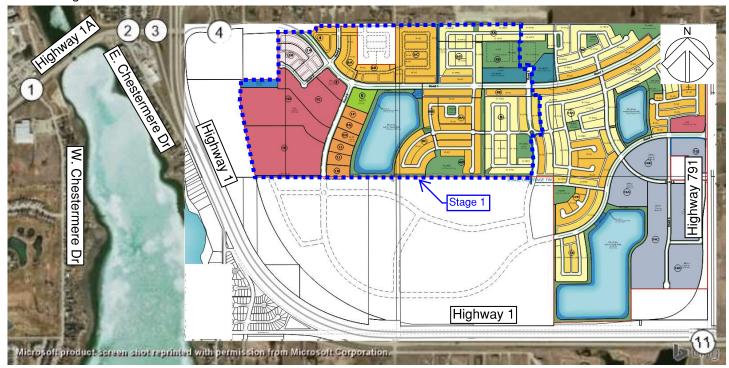


TB - Turn Bay CH - Channelized

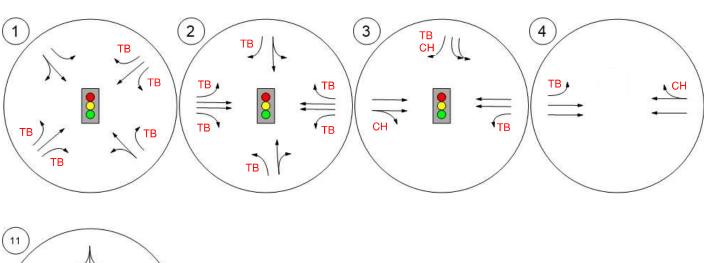


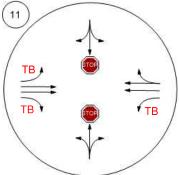


### Lane Configuration and Traffic Control



TB - Turn Bay CH - Channelized







## **4.0** Signal Warrants

### 4.1 2023 Horizon

The Traffic Signal and Pedestrian Signal Head Warrant from Transportation Association of Canada (TAC) was used to check if a traffic signal is warranted at the intersection of Highway 1 / Highway 791 in the 2023 horizon. In the warrant, a factor of 2.61 was applied to convert the AM and PM peak volumes to 6-hour peak traffic. Using the 2023 Background + Development traffic volumes and the existing lane configurations, a warrant score of 75 was calculated, thus a signal is not warranted in this time horizon. Note: The 2023 Background scenario was not checked as the traffic volumes are lower than 2023 Background + Development.

The detailed 2023 Background + Development signal warrant is provided in Appendix D.

Note: The warrant relates to the previous version of the site plan. As noted in Section 2.4, the change in generated traffic of the latest site plan were considered within acceptable range, thus no update to the warrant was required.

### **5.0** Conclusions

The Clearwater Park Transportation Impact Assessment (TIA) has been undertaken for the proposed Area Structure Plan for Centron Real Estate and Development. The following provides a brief summary of the Transportation Impact Assessment completed for the development.

#### 5.1 2023 Horizon

The 2023 Build-Out generates a total of 1,014 trips in the AM Peak and 1,142 trips in the PM Peak.

From the 2023 Background + Development scenario, the following infrastructure is required to accommodate the land use.

- Highway 1 / Highway 1A West Junction: Signalization of the intersection and the implementation of dual southbound left turn lanes.
- Highway 1 / West Chestermere Drive: Convert the northbound left to shared thru left, to accommodate high northbound right turning vehicles.

Note: The analysis of the 2023 Build-Out is based on a previous version of the 2023 Build-Out site plan. As the generated traffic volumes of the latest site plan are similar to the previous site plan, the 2023 traffic analysis do not require any update.

#### 5.2 2028 and 2039 Build-Out

The analyses of the 2028 and 2039 Build-Out will be undertaken at the time of the application of these two build-out stages. Additional policies to the Municipal Development Plan (MDP) and Area Structure Plan (ASP) were added to ensure that a TIA update will be undertaken. The policies had been accepted by City Administration and Clearwater Park has been permitted to move forward with the MDP and ASP application. The additional policies for the MDP and ASP are as follows:

- Section 4.3.1 General Transportation Policy (Page 56) of MDP:
  - 4.3.1.8: Any proposed roadway intersection with Highway 791 / Range Road 280 shall require an updated Transportation Impact Assessment. The Transportation Impact Assessment shall consider, but not be limited to, to the continued viability of the Highway 791 / 1 intersection. The Transportation Impact Assessment shall be reviewed and approved by the City of Chestermere and Alberta Transportation.
- Section 6.0 Transportation (page 38) of the ASP
  - All financing and cost sharing for Transportation Improvements required for the ASP shall be negotiated
    and reviewed by the City of Chestermere prior to Outline Plan. All improvements associated with the
    Provincial highways shall be reviewed and approved by Alberta Transportation.



### 6.0 Closure

ISL Engineering and Land Services Ltd. has prepared this report entitled "Clearwater Park Transportation Impact Assessment" for Centron Real Estate and Development to support the proposed Clearwater Park Area Structure Plan. The material contained herein reflects ISL's best judgment in light of the information available at the time of the study and the level of detail normally expected at the preliminary planning stage.

Any use which a third party makes of this report or reliance on this report or decision made based on this report are the sole responsibility of such third parties. ISL accepts no responsibility for damages, if any suffered by a third party as a result of decisions made, or actions taken, based on this report.



APPENDIX
Scope of Work

### **Alan Kuan**

From: Trevor Richelhof <Trevor.Richelhof@gov.ab.ca>

**Sent:** December 3, 2019 9:11 AM

To: Alex Ho
Cc: Alan Kuan

Subject: RE: Centron TIA Inquiry Regarding June 2009 Bayfield TIA

**Attachments:** Hwy 1 1A Functional Plans.zip; Hwy 791.zip

Hi Alex, I do have drawings.

Hope this works.

#### Trevor Richelhof, C.E.T.

Development / Planning Technologist Construction & Maintenance, Southern Region Alberta Transportation Government of Alberta

Willowglen Business Park 2<sup>nd</sup> Floor, 803 Manning Road NE Calgary AB T2E 7M8

Tel 403-297-7652 Cell 403-660-3106 Fax 403-297-7682

Trevor.Richelhof@gov.ab.ca

Applications/referrals: <u>TransDevelopmentCalgary@gov.ab.ca</u>

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From: Alex Ho <aho@islengineering.com> Sent: Monday, December 02, 2019 4:24 PM

To: Trevor Richelhof <Trevor.Richelhof@gov.ab.ca>

Cc: Alan Kuan < AKuan@islengineering.com>

Subject: RE: Centron TIA Inquiry Regarding June 2009 Bayfield TIA

Hi Trevor,

Do you have the CAD plans of both the Hwy 1 / 1A interchange and Hwy 1 / 791 interchange?

Thanks,

Alex Ho, P.Eng., PTOE | Manager, Traffic Engineering

ISL Engineering and Land Services Ltd.

From: Alex Ho

Sent: June 5, 2019 5:05 PM

To: Trevor Richelhof < <a href="mailto:Trevor.Richelhof@gov.ab.ca">Trevor.Richelhof@gov.ab.ca</a>

Subject: RE: Centron TIA Inquiry Regarding June 2009 Bayfield TIA

Thanks Trevor, got the files.

### Alex Ho, P.Eng., PTOE | Manager, Traffic Engineering

ISL Engineering and Land Services Ltd.

From: Alex Ho

Sent: June 5, 2019 4:07 PM

**To:** Trevor Richelhof < <a href="mailto:Trevor.Richelhof@gov.ab.ca">Trevor.Richelhof@gov.ab.ca</a>; <a href="mailto:psaik@chestermere.ca">psaik@chestermere.ca</a>

Subject: RE: Centron TIA Inquiry Regarding June 2009 Bayfield TIA

Hi Trevor,

Yes, please send over the reports.

You can use our ftp site: https://isl.wetransfer.com/

Paul, any comments?

Thanks,

### Alex Ho, P.Eng., PTOE | Manager, Traffic Engineering

ISL Engineering and Land Services Ltd.

From: Trevor Richelhof < <a href="mailto:Trevor.Richelhof@gov.ab.ca">Trevor.Richelhof@gov.ab.ca</a>>

Sent: June 5, 2019 8:50 AM

**To:** Alex Ho <aho@islengineering.com>; psaik@chestermere.ca **Subject:** RE: Centron TIA Inquiry Regarding June 2009 Bayfield TIA

Hi Alex

I would add in a review of the Highway 791 Functional Planning Study (completed in 2009) and the Highway 1 / 1A (Chestermere Boulevard) Functional Planning Study (2011)

I can provide copies of both studies if required. (~200mb)

#### **Trevor Richelhof**

Development / Planning Technologist Delivery Services, Southern Region Alberta Transportation Government of Alberta

Willowglen Business Park 2<sup>nd</sup> Floor, 803 Manning Road NE Calgary AB T2E 7M8 Tel 403-297-7652 Cell 403-660-3106 Fax 403-297-7682

Trevor.Richelhof@gov.ab.ca

Applications/referrals: TransDevelopmentCalgary@gov.ab.ca

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Alberta

From: Alex Ho <aho@islengineering.com>
Sent: Monday, May 27, 2019 1:59 PM

**To:** Trevor Richelhof < Trevor.Richelhof@gov.ab.ca>; psaik@chestermere.ca

Subject: RE: Centron TIA Inquiry Regarding June 2009 Bayfield TIA

Trevor / Paul

ISL has been retained by Centron to update the Chestermere Business Park (CBP) TIA. Centron's land is 740 acres and is shown in the image below.

The original TIA was undertaken by ISL in 2009 to support of the Mountain View Conceptual Scheme (originally adopted by Rocky View County in 2007) and was later adopted by the City of Chestermere in 2010 when the City annexed the lands.

The TIA and TIA Review Reponses letter can be downloaded here: <a href="https://we.tl/t-uRl5kbKxBR">https://we.tl/t-uRl5kbKxBR</a> (please note the link expires in 7 days)

We would like to update the 2009 TIA in the following steps:

- Review background information in the study area.
- Obtain 2018 traffic counts at the intersections of Hwy 1 / Hwy 791, Hwy 1 / Hwy 1A, Hwy 1A / East Chestermere
   Dr, Hwy 1A / West Chestermere Dr from the AT website
- Estimate the 5-year (2023) background traffic volumes by applying a growth rate (calculated from the traffic volume history on the AT website) to the 2018 traffic data
- Generate Stage 1 trips using ITE Trip Generation Manual, 10<sup>th</sup> Edition; distribute trips using the travel patterns
  of the 2018 traffic counts
- Add the generated Stage 1 traffic to the 2023 background traffic
- Stage 1 is anticipated on the west side of the lands, with access off Hwy 1 / Hwy 1A
- Analyze the following scenarios in 2023:
  - Scenario 1: 2023 background network.
  - Scenario 2: 2023 background network with Stage 1 of the CBPB
- Analyze the following intersections in 2023:
  - Hwy 1 / Hwy 1A
  - o Hwy 1A / East Chestermere Dr
  - o Hwy 1A / West Chestermere Dr
  - Hwy 1A / Bayfield Road
  - Major internal intersections
- Obtain the future traffic volume and Select Zone Analysis of the subject lands from the City's TMP in the 2039 horizon
- Back-out the traffic of Centron's land to obtain the 2039 background traffic
- The full build-out of Centron's lands (740 acres) is anticipated in 2039
- Analyze the following scenarios in 2039:

- o Scenario 3: 2039 background network.
- o Scenario 4: 2039 background network with entire Chestermere Business Park
- Analyze the following intersections in 2023:
  - o Hwy 1 / Hwy 1A
  - o Hwy 1A / East Chestermere Dr
  - o Hwy 1A / West Chestermere Dr
  - o Hwy 1 / Hwy 791
  - o Hwy 791 / Bayfield Blvd
  - o Hwy 791 / Bayfield Dr
  - o Major internal intersections
- Determine, from the analysis, the capacity requirements and configuration for the analyzed intersections.
- Confirm internal road classifications based on projected daily traffic volumes and environmental capacity guidelines.



### Alex Ho, P.Eng., PTOE | Manager, Traffic Engineering

**ISL Engineering and Land Services Ltd.** 

4015 - 7 Street SE

Calgary, AB T2G 2Y9

**T**: 403.254.0544 **F**: 403.254.9186 **C**: 403.605.5531

aho@islengineering.com islengineering.com

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https://511.alberta.ca/ https://twitter.com/511Alberta

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APPENDIX
2018 Alberta Transportation Count Data

В

North	/ndrmrBl	vd	
Vehicle Typ	Vol	%	
A: Passenger Vehicle	•	12277	96.5
B: Recreational Vehic	cle	85	0.7
C: Bus		68	0.5
D: Single Unit Truck		271	2.1
E: Tractor Trailer Uni	19	0.1	
ASDT 131/0	AADT	12720	

С 27

D E 128 10 NR NT NL 6400

1210

A 1188 B 6 C 10 D 6 E 0

ST

3730

A 3559 B 30 C 19 D 114 E 8

ER

Ē 36

C D E 19 13 0

1108 A B

10

1150

Reference No.: 85212 1A & W CHESTRMERE DR 15-24-28-403500200 ASDT 13140 | **AADT** 2018 AADT / ASDT ESTIMATES 6320 1460 A 1415 B 9 C 12 D 23 E 1 A 6115 В 40

1460

1413 ВС

Ď 30

E

Α

B C D

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B C D

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38 WR-

WR

ABCDE

293

310

6

**A** 1113

1130

2590

5 | C 27

5

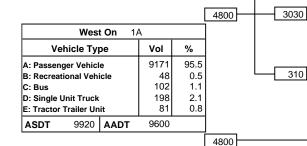
D 14

Ε

B 5

D

NR◀



ER A B C D 2862 7517 13 55 38 84 78 206 39 Ε 48 301 3589 A B n 27 5 SL 🍕 С 15 3730 D E 93 0 6 4595 WL 2887 Α 29 В 15 52 č 34 58 3030 WT 86 D

> SL ST SR

A B C D E

2597

2670

16

34

23

0

WL

East On 1A Vehicle Type Vol % 95.5 A: Passenger Vehicle 15101 B: Recreational Vehicle 107 0.7 C: Bus 152 1.0 D: Single Unit Truck 370 2.3 E: Tractor Trailer Unit 90 0.6 15820 **ASDT** 16340 **AADT** 

7910

7910

### **TURNING MOVEMENT ABBREVIATIONS**

Intersection of:

NR: Traffic From North Turning Right

NL: Traffic From North Turning Left

NT: Traffic From North Proceeding Through

SR: Traffic From South Turning Right

SL: Traffic From South Turning Left

ST: Traffic From South Proceeding Through

ER: Traffic From East Turning Right

EL: Traffic From East Turning Left

ET: Traffic From East Proceeding Through

WR: Traffic From West Turning Right

WL: Traffic From West Turning Left

WT: Traffic From West Proceeding Through

### **TURNING MOVEMENT ABBREVIATIONS**

AADT: Annual Average Daily Traffic Average daily traffic expressed as vehicles per day fo period of January 1 to December 31 (365 days)

ASDT: Average Summer Daily Traffic Average daily traffic expressed as vehicles per day fo period of May 1 to September 30 (153 days)

	South	h On	Chstrm	r Dr	
Vehicle Type			Vol	%	
A: Passen	ger Vehicl	е	5099	96	6.9
B: Recreat	ional Vehi	icle	40	ol d	8.0
C: Bus			72	2 1	.4
D: Single U	Jnit Truck		47	7   C	).9
E: Tractor	2	2 0	0.0		
ASDT	5430	AADT	5260	)	

**A** 1096 **B** 12

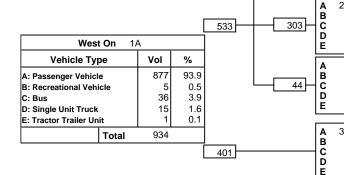
North On	/ndrmrBl	vd	
Vehicle Type	Vol	%	
A: Passenger Vehicle	1281	96.0	
B: Recreational Vehicle		8	0.6
C: Bus		7	0.5
D: Single Unit Truck		38	2.8
E: Tractor Trailer Unit	1	0.1	
Tota		1335	

Reference No.: 85212 Intersection of: 1A & W CHESTRMERE DR 15-24-28-403500200 Total 2018 a.m. 100th Highest Hour ESTIMATES 721 119 698 3 A B C D E 113 1 A B C D E 4 16 0

B C D E

WR-

186



185 NR NT NL WL ST ER NR€ 0 ER A B C D D EL E 285 677 5 13 25 38 426 3 ABCDE 0 6 SL 🍕 0 442 0 13 0 369 WL A B C 235 20 WT 19 261 D E Ō 0

614 148

145

A B C D E

1 4 0

347

325 3 1

17 1

120

9

131

A B C D E

A B C D E

Eas	st On 1	1A	
Vehicle Ty	/ре	Vol	%
A: Passenger Vehicl	е	1458	93.7
B: Recreational Vehi	icle	12	0.8
C: Bus		41	2.6
D: Single Unit Truck		43	2.8
E: Tractor Trailer Un	it	2	0.1
	Total	1556	-

722

834

### **TURNING MOVEMENT ABBREVIATIONS**

NR: Traffic From North Turning Right NL: Traffic From North Turning Left

NT: Traffic From North Proceeding Through

SR: Traffic From South Turning Right

SL: Traffic From South Turning Left

ST: Traffic From South Proceeding Through

ER: Traffic From East Turning Right

EL: Traffic From East Turning Left

ET: Traffic From East Proceeding Through

WR: Traffic From West Turning Right

WL: Traffic From West Turning Left

WT: Traffic From West Proceeding Through

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	<b>VR</b> 21		<b>NT</b> 87		<b>L</b> 67	٤	L S	T SF 303	₹ 
B	0	В	0	B	1		B	2	
B C D E	0	C	3	C	3		C	16 2 0	
Ē	ŏ	Ē	ő	Ē	Ö		E	0	
	21		93		72				
_		_							
			186					323	

South On Chstrmr Dr			Dr
Vehicle Typ	ре	Vol	%
A: Passenger Vehicl	е	478	93.9
B: Recreational Vehi	icle	3	0.6
C: Bus		22	4.3
D: Single Unit Truck		6	1.2
E: Tractor Trailer Un	0	0.0	
	Total	509	

North O	/ndrmrBl	vd	
Vehicle Type	Vol	%	
A: Passenger Vehicle		1055	99.1
B: Recreational Vehicle		4	0.4
C: Bus		0	0.0
D: Single Unit Truck		6	0.6
E: Tractor Trailer Unit	0	0.0	
To	otal	1065	

East On

Total

1A

Vol

1529

13

1557

98.2

0.4

0.1

0.8

0.4

2018 p.m. 100th Highest Hour ESTIMATES 540 525 112 81 332 81 A B C D D E 328 3 0 535 111 81 A B C D E A B C D E A B C D E 0 0 4 0 NR NT NL WL ST ER B C D E 65 NR€ ER A B C D D EL E 226 694 ABCDE 233 323 708 West On 1A Vehicle Type Vehicle Type Vol % 24 338 ABCDE BCD A: Passenger Vehicle A: Passenger Vehicle 870 97.6 0 25 0 B: Recreational Vehicle B: Recreational Vehicle 0.2 341 0.0 C: Bus C: Bus D: Single Unit Truck 12 1.3 D: Single Unit Truck 0 E: Tractor Trailer Unit 0.8 E: Tractor Trailer Unit 556 WL A B C 418 A B C D E 891 Total 0 427 568 0 849 WT 6 5 D E 5 WR-**TURNING MOVEMENT ABBREVIATIONS** 79 NR: Traffic From North Turning Right ABCDE NL: Traffic From North Turning Left 81 NT: Traffic From North Proceeding Through SR: Traffic From South Turning Right WR <u>ŞL</u> ST SR SL: Traffic From South Turning Left 27 0 A B A B C D E 133 184 A B C D E A B C D E ST: Traffic From South Proceeding Through 0 0 | C ER: Traffic From East Turning Right 2 0 Ď EL: Traffic From East Turning Left 0 0 ET: Traffic From East Proceeding Through 29 134 143 WR: Traffic From West Turning Right

306

Reference No.: 85212 Intersection of:

1A & W CHESTRMERE DR 15-24-28-403500200

WL: Traffic From West Turning Left

WT: Traffic From West Proceeding Through

South	ı On	Chstrmr Dr		
Vehicle Typ	ре		Vol	%
A: Passenger Vehicl	е		484	98.2
B: Recreational Vehi	cle		0	0.0
C: Bus			2	0.4
D: Single Unit Truck			7	1.4
E: Tractor Trailer Unit			0	0.0
	Total		493	

	North	ove Dr		
Vel	nicle Typ	е	Vol	%
A: Passeng	er Vehicle	9	2544	97.5
B: Recreati	onal Vehi	cle	29	1.1
C: Bus			0	0.0
D: Single U	nit Truck		37	1.4
E: Tractor Trailer Unit			0	0.0
ACDT	2700	AADT	2610	

1310

130

129

0

0

ST

B C D E

A B C D E

13

0

WL

400

389

0

ER A

Ε 56

В 41

D 164 Ε

A B 694

5733

72

241

392 Α

0

0

4739 Α

35

15 1

400

4980

720

6110

6100

East On

12610 **AADT** 

Vehicle Type

A: Passenger Vehicle

D: Single Unit Truck

E: Tractor Trailer Unit

C: Bus

ASDT

B: Recreational Vehicle

1A

Vol

11558

127

10

423

12210

92

%

94.7

1.0

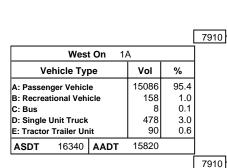
0.1

3.5

8.0

ER

Reference No.: 86217 1A & E CHESTERMERE DR 14-24-28-415500000 ASDT 2700 **AADT** 2018 AADT / ASDT ESTIMATES 1300 780 758 A 1268 A B C D E 9 В 15 С 0



Intersection of:

4980 С D 21 Ε 54 209 В 2150 С D Ε 758 В 7 С

761

0 4650

NR€ 10

BCD

E

В

D E 21

780

D E

NR NT NL

17

0

**TURNING MOVEMENT ABBREVIATIONS** 

NR: Traffic From North Turning Right

NL: Traffic From North Turning Left

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SL: Traffic From South Turning Left

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ET: Traffic From East Proceeding Through

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WL: Traffic From West Turning Left

WT: Traffic From West Proceeding Through

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AADT: Annual Average Daily Traffic Average daily traffic expressed as vehicles per day fo period of January 1 to December 31 (365 days)

ASDT: Average Summer Daily Traffic Average daily traffic expressed as vehicles per day fo period of May 1 to September 30 (153 days)

60 5 211 54	ЕТ◀		_ -				_		— ET — EL	B C D E
2090 16 1 43 0	SL <del>◀</del>			=	=		_		 ►NL	A B C D E
7585 73 2 214 36	WL —— WT —— WR —						_		 ►w⊤	A B C D E
	WR	Y N	V IT	E	y L	Si	L S	T SR	►SR	A B C D E
	C   D 3	3 B C D E	115 1 0 4 0	A B C D E	694 8 3 23 2 2 730		A 2 B C D E	2913 26 2 58 1		
		3	000				3	000		
				South	n On	EChst	rmr[	Or		
		۱ ۱	/ehicle	e Tvr	oe .	l vo	ыί	%		

	Sout	E	Chstrmi	Dr	
Vehicle Type				Vol	%
A: Passenger Vehicle			T	5810	96.8
B: Recreat	ional Veh	icle	1	58	1.0
C: Bus			1	6	0.1
D: Single U	Jnit Truck		1	122	2.0
E: Tractor Trailer Unit			1	4	0.1
ASDT	6200	AADT		6000	

North	n On	Cove Dr	
Vehicle Ty	ре	Vol	%
A: Passenger Vehicl	е	234	96.7
B: Recreational Vehi	icle	6	2.5
C: Bus		0	0.0
D: Single Unit Truck		2	0.8
E: Tractor Trailer Un	it	0	0.0
	Total	242	

Vehicle Type

A: Passenger Vehicle B: Recreational Vehicle

D: Single Unit Truck

E: Tractor Trailer Unit

C: Bus

Vol

399

415

Total

% 96.1

> 1.9 1.0

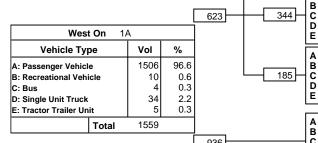
> > 1.0

0.0

19

Reference No.: 86217 Intersection of: 1A & E CHESTERMERE DR 14-24-28-415500000 Total 2018 a.m. 100th Highest Hour ESTIMATES 203 B C D E 0 2 0

> B C D E 94



B C D A B C D E 936

### **TURNING MOVEMENT ABBREVIATIONS**

NR: Traffic From North Turning Right

NL: Traffic From North Turning Left

NT: Traffic From North Proceeding Through

SR: Traffic From South Turning Right

SL: Traffic From South Turning Left

ST: Traffic From South Proceeding Through

ER: Traffic From East Turning Right

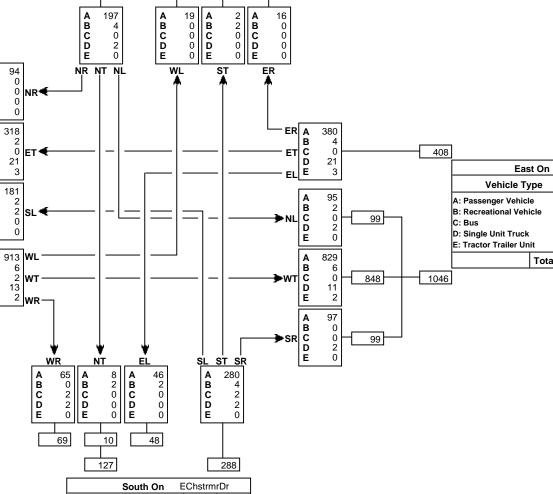
EL: Traffic From East Turning Left

ET: Traffic From East Proceeding Through

WR: Traffic From West Turning Right

WL: Traffic From West Turning Left

WT: Traffic From West Proceeding Through



1A

Total

Vol

1401

12

36

1454

96.4

0.8

0.0

2.5

0.3

39

4

North On	С	ove Dr	
Vehicle Type		Vol	%
A: Passenger Vehicle		299	97.4
B: Recreational Vehicle		2	0.7
C: Bus		0	0.0
D: Single Unit Truck		6	2.0
E: Tractor Trailer Unit		0	0.0
Tota		307	

East On

Total

1A

Vol

1232

13

18

1270

97.0

1.0

0.2

1.4

0.4

Total 2018 p.m. 100th Highest Hour ESTIMATES 125 182 105 18 59 122 0 18 0 58 101 A B C D E A B C D E A B C D E A B C D E 0 3 0 0 0 0 NR NT NL WL ST ER B C D E NR€ 0 0 ER A B C D D EL E 429 577 A B C D E 443 694 592 2 West On 1A 3 Vehicle Type Vehicle Type Vol % 178 40 ABCDE A: Passenger Vehicle A: Passenger Vehicle 1519 97.4 B C D 179 0 B: Recreational Vehicle B: Recreational Vehicle 14 0.9 SL 🍕 42 0 0.1 C: Bus C: Bus D: Single Unit Truck 19 1.2 D: Single Unit Truck 0 E: Tractor Trailer Unit 0.3 E: Tractor Trailer Unit 840 WL A B C 537 A B C D E 1559 Total 865 556 678 WT 17 D E 14 2 2 WR-**TURNING MOVEMENT ABBREVIATIONS** 78 2 0 0 0 NR: Traffic From North Turning Right ABCDE NL: Traffic From North Turning Left 80 NT: Traffic From North Proceeding Through SR: Traffic From South Turning Right WR <u>ŞL</u> ST SR SL: Traffic From South Turning Left 202 2 0 10 0 0 274 3 A B C A B C D E A B C D E ABCDE ST: Traffic From South Proceeding Through 0 ER: Traffic From East Turning Right Ď EL: Traffic From East Turning Left 0 0 0 ET: Traffic From East Proceeding Through 204 11 90 WR: Traffic From West Turning Right WL: Traffic From West Turning Left

305

Reference No.: 86217 Intersection of:

1A & E CHESTERMERE DR 14-24-28-415500000

WT: Traffic From West Proceeding Through

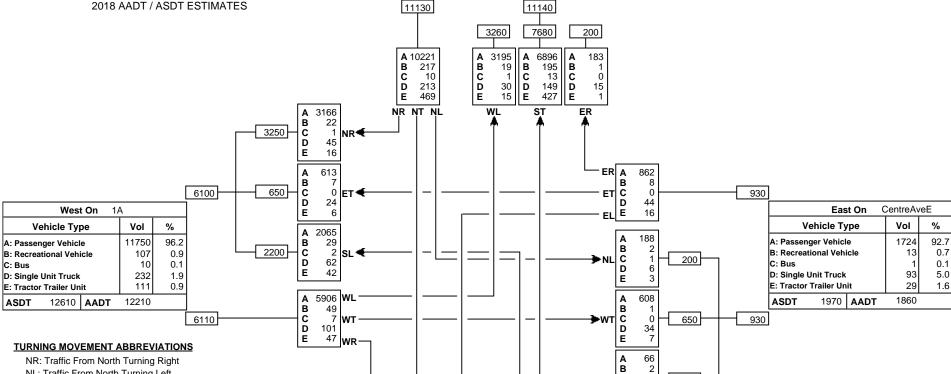
Sout	h On	EChstrm	rDr
Vehicle Ty	ре	Vol	%
A: Passenger Vehicl	е	576	99.0
B: Recreational Veh	icle	5	0.9
C: Bus		0	0.0
D: Single Unit Truck		1	0.2
E: Tractor Trailer Un	it	0	0.0
	Total	582	

	North	n <b>O</b> n 1		
v	ehicle Ty	ре	Vol	%
A: Passe	nger Vehicl	е	20495	92.0
B: Recrea	ational Veh	icle	432	1.9
C: Bus		24	0.1	
D: Single	<b>Unit Truck</b>		407	1.8
E: Tracto	r Trailer Un	it	912	4.1
ASDT	24140	AADT	22270	

2018 AADT / ASDT ESTIMATES

Reference No.: 86210 Intersection of:

1 & 1A E OF CALGARY



NR: Traffic From North Turning Right

NL: Traffic From North Turning Left

NT: Traffic From North Proceeding Through

SR: Traffic From South Turning Right

SL: Traffic From South Turning Left

ST: Traffic From South Proceeding Through

ER: Traffic From East Turning Right

EL: Traffic From East Turning Left

ET: Traffic From East Proceeding Through

WR: Traffic From West Turning Right

WL: Traffic From West Turning Left

WT: Traffic From West Proceeding Through

### **TURNING MOVEMENT ABBREVIATIONS**

AADT: Annual Average Daily Traffic Average daily traffic expressed as vehicles per day fo period of January 1 to December 31 (365 days)

ASDT: Average Summer Daily Traffic Average daily traffic expressed as vehicles per day fo period of May 1 to September 30 (153 days)

South	n On	1	
Vehicle Typ	ре	Vol	%
A: Passenger Vehicle	е	18063	90.7
B: Recreational Vehi	cle	448	2.2
C: Bus		29	0.1
D: Single Unit Truck		424	2.1
E: Tractor Trailer Un	it	956	4.8
ASDT 21600	ΔΔΩΤ	19920	

66

80

Α

В 193

WR

A 2103 B 29 C 6 D 37 E 25

2200

6 С NT

8 c

450

7680

9960

Α 6867

В

D E 162 D C D E

SL ST SR

226

220

472

9960

15

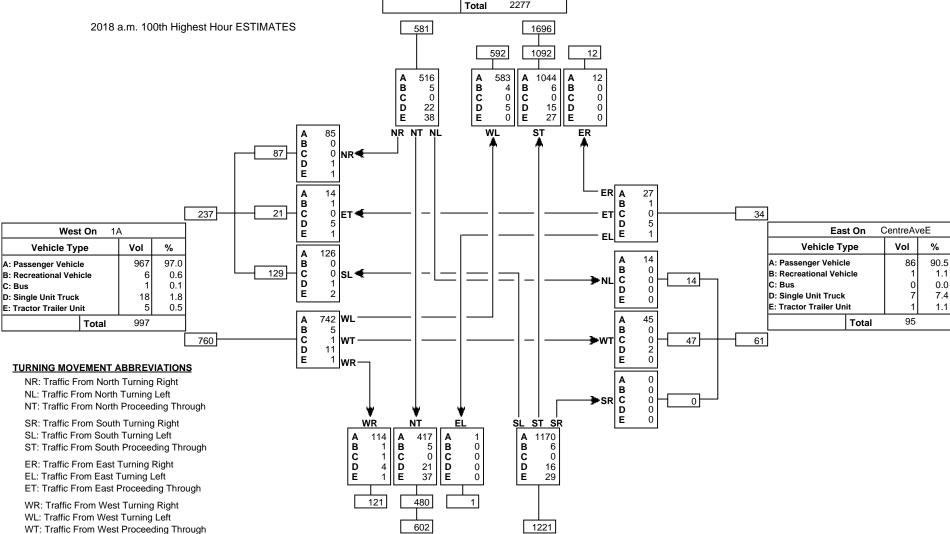
Α 9027

BCDE

0 9 3

North On 1		
Vehicle Type	Vol	%
A: Passenger Vehicle	2155	94.6
B: Recreational Vehicle	15	0.7
C: Bus	0	0.0
D: Single Unit Truck	42	1.8
E: Tractor Trailer Unit	65	2.9
Tatal	2277	

Reference No.: 86210
Intersection of:
1 & 1A E OF CALGARY

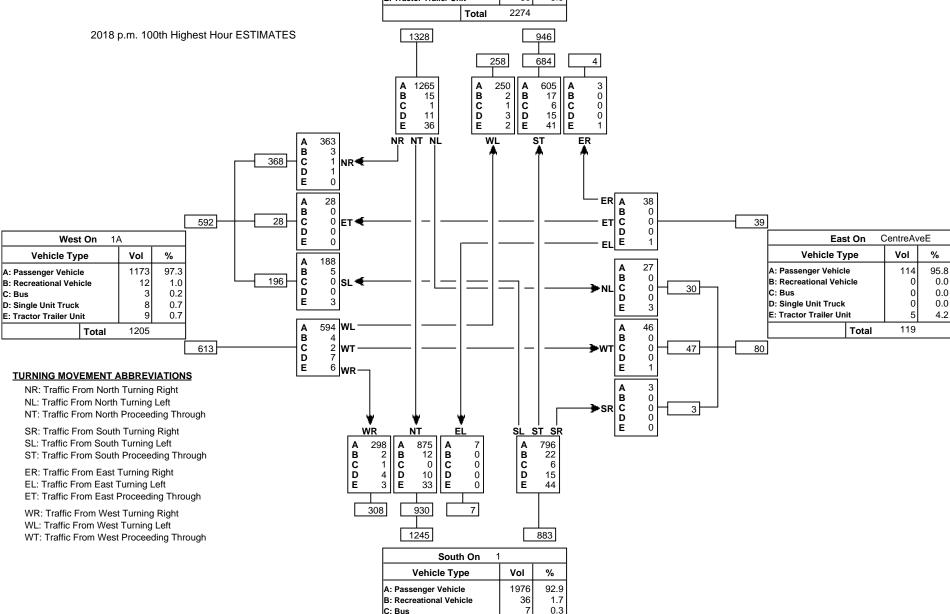


Sout	h On	1	
Vehicle Ty	ре	Vol	%
A: Passenger Vehicl	е	1702	93.4
B: Recreational Veh	icle	12	0.7
C: Bus		1	0.1
D: Single Unit Truck		41	2.2
E: Tractor Trailer Un	it	67	3.7
	Total	1823	

North On 1		
Vehicle Type	Vol	%
A: Passenger Vehicle	2123	93.4
B: Recreational Vehicle	34	1.5
C: Bus	8	0.4
D: Single Unit Truck	29	1.3
E: Tractor Trailer Unit	80	3.5

Reference No.: 86210
Intersection of:

1 & 1A E OF CALGARY



D: Single Unit Truck

E: Tractor Trailer Unit

29

80

2128

Total

1.4

3.8

Nort	h On 7	91	
Vehicle Ty	ре	Vol	%
A: Passenger Vehic	le	169	84.5
B: Recreational Vel	nicle	7	3.5
C: Bus		1 1	0.5
D: Single Unit Trucl	k	16	8.0
E: Tractor Trailer U	nit	7	3.5
ASDT 220	AADT	200	

60

A B C D E

WL

54

A B C D E

SL ST SR

A B C D E

1207

10

19

31 23

1290

100

20

16 0

0

ST

ABCDE

ER

20

14

ER A B C D

EL

Ε 546

A B

С

D E

B

D E

C D E 12 5 9

7401

106

223

44

18

0

0

7221 Α

90

33 167

509

272 2 A B

20

8020

300

8320

8340

East On

18060 **AADT** 

Vol

14912

198

397

1064

16660

89

89.5

0.5

2.4

6.4

Vehicle Type

A: Passenger Vehicle

D: Single Unit Truck

E: Tractor Trailer Unit

C: Bus

**ASDT** 

B: Recreational Vehicle

ASDT 220 **AADT** 2018 AADT / ASDT ESTIMATES 100 85 B 0 D E 3 NR NT NL 50 BCD 60 NR€ Е 3 7122 B C D 100 8010 9040 41 ET **⋖** 212 West On 1 E 535 Vehicle Type % Vol Α 919 A: Passenger Vehicle 16275 90.0 B C D 8 970 7 B: Recreational Vehicle 202 SL 🍕 1.1 22 110 0.6 C: Bus Ε 14 424 2.3 D: Single Unit Truck 1069 5.9 E: Tractor Trailer Unit 8184 WL ASDT 19600 **AADT** 18080 B C D E 91 62 9040 WT 186 517 WR-**TURNING MOVEMENT ABBREVIATIONS** NR: Traffic From North Turning Right NL: Traffic From North Turning Left NT: Traffic From North Proceeding Through SR: Traffic From South Turning Right WR SL: Traffic From South Turning Left A B C D E 909 Α В ST: Traffic From South Proceeding Through В 29 16 5 CDE 0 2 0 | C ER: Traffic From East Turning Right P EL: Traffic From East Turning Left ET: Traffic From East Proceeding Through 960 20 290 WR: Traffic From West Turning Right WL: Traffic From West Turning Left 1270 WT: Traffic From West Proceeding Through

	South	h On	791	
Ve	hicle Ty	ре	Vol	%
A: Passen	ger Vehicl	е	2398	93.7
B: Recreat	ional Vehi	icle	15	0.6
C: Bus			50	2.0
D: Single (	Jnit Truck		59	2.3
E: Tractor	Trailer Un	it	38	1.5
ASDT	2780	AADT	2560	

265

10 10

### **TURNING MOVEMENT ABBREVIATIONS**

Reference No.: 89200 Intersection of:

1 & 791 S OF DELACOUR

AADT: Annual Average Daily Traffic Average daily traffic expressed as vehicles per day fo period of January 1 to December 31 (365 days)

ASDT: Average Summer Daily Traffic Average daily traffic expressed as vehicles per day fo period of May 1 to September 30 (153 days)

North	On 7	91	
Vehicle Typ	ре	Vol	%
A: Passenger Vehicle	e	10	90.9
B: Recreational Vehi	cle	0	0.0
C: Bus		1	9.1
D: Single Unit Truck		0	0.0
E: Tractor Trailer Un	it	0	0.0
	Total	11	

1 & 791 S OF DELACOUR 2018 a.m. 100th Highest Hour ESTIMATES

1227

0 A B C D D E A B C D E ABCDE 5 0 0 0 A B C D E NR NT NL WL ST B C D E

0

1097

A B C D E

1175

West On 1		
Vehicle Type	Vol	%
A: Passenger Vehicle	1692	91.5
B: Recreational Vehicle	14	0.8
C: Bus	13	0.7
D: Single Unit Truck	41	2.2
E: Tractor Trailer Unit	89	4.8
Total	1849	

Reference No.: 89200 Intersection of:

> B C D 48 A B C D E 622

### **TURNING MOVEMENT ABBREVIATIONS**

NR: Traffic From North Turning Right NL: Traffic From North Turning Left

NT: Traffic From North Proceeding Through

SR: Traffic From South Turning Right

SL: Traffic From South Turning Left

ST: Traffic From South Proceeding Through

ER: Traffic From East Turning Right

EL: Traffic From East Turning Left

ET: Traffic From East Proceeding Through

WR: Traffic From West Turning Right

WL: Traffic From West Turning Left

WT: Traffic From West Proceeding Through

13 51							-					— EL	D E
47 0 0 0 1	SL◀	-		_[	_	=	-		]-			→NL	A B C D
544 6 7 28 37	WL - WT - WR -	7		_		_			_			→wT	A B C D E
		₩ WR	, N	<b>y</b>	E	<b>₩</b>		ş	L S	T SR		→SR	A B C D E
	A B C D E	51 0 1 2 0	A B C D E	1 0 0 0 0	A B C D E	46 0 0 0 1			A B C D E	62 0 0 0 2			
	_			102	_					64			
					Sout	h On	7	791			4		

ER A B C D D EL E

1147

13

52

0

0

492

6 26 37

15 0

0

567

16

1227

583

East On

Total

Vol

1654

14

13

39

90

1810

91.4

0.8

0.7

2.2

5.0

Vehicle Type

A: Passenger Vehicle

D: Single Unit Truck

E: Tractor Trailer Unit

C: Bus

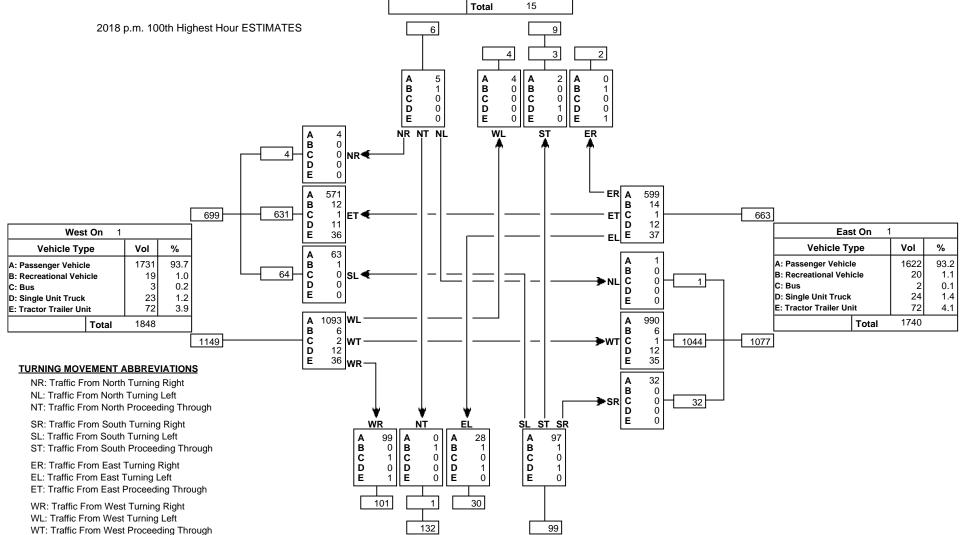
B: Recreational Vehicle

102			0.					
South	icle 160 96							
Vehicle Typ	ре	Vol	%					
A: Passenger Vehicl	160	96.4						
B: Recreational Vehi	0	0.0						
C: Bus		1	0.6					
D: Single Unit Truck		2	1.2					
E: Tractor Trailer Un	it	3	1.8					
	Total	166						

North On	791	
Vehicle Type	Vol	%
A: Passenger Vehicle	11	73.3
B: Recreational Vehicle	2	13.3
C: Bus	0	0.0
D: Single Unit Truck	1	6.7
E: Tractor Trailer Unit	1	6.7
1	45	

Reference No.: 89200 Intersection of: 1 & 791 S OF DELACOUR

1 & 791 3 OF DELACOOK



South On 791  Vehicle Type Vol %										
Vehicle Typ	эе	Vol	%							
A: Passenger Vehicl	е	224	97.0							
B: Recreational Vehi	3	1.3								
C: Bus		1	0.4							
D: Single Unit Truck		2	0.9							
E: Tractor Trailer Un	it	1	0.4							
	Total	231	•							



APPENDIX
Synchro Results

Lanes, Volumes, Timings
1: W Chestermere Dr/Windermere Blvd & Hwy 1A

Existing AM Peak

	٠	<b>→</b>	•	•	•	•	1	†	-	-	ļ	1
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	*	<b>†</b>	7	*	<b>†</b>	7	*	1>		*	<b>1</b>	
Traffic Volume (vph)	119	261	21	72	303	347	44	148	131	442	93	186
Future Volume (vph)	119	261	21	72	303	347	44	148	131	442	93	186
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Storage Length (m)	110.0		110.0	70.0		85.0	50.0		0.0	0.0		0.0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (m)	25.0			25.0			25.0			25.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.930			0.900	
FIt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1676	1765	1500	1676	1765	1500	1676	1641	0	1709	1619	0
FIt Permitted	0.457			0.520			0.579			0.338		
Satd. Flow (perm)	806	1765	1500	918	1765	1500	1022	1641	0	608	1619	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			90			369		65			198	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		222.2			154.7			131.0			133.7	
Travel Time (s)		16.0			11.1			9.4			9.6	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	6%	6%	6%	4%	4%	4%
Adj. Flow (vph)	127	278	22	77	322	369	47	157	139	470	99	198
Shared Lane Traffic (%)												
Lane Group Flow (vph)	127	278	22	77	322	369	47	296	0	470	297	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
Turning Speed (k/h)	30		25	30		25	30		25	30		25
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases		2			6			8		7	4	
Permitted Phases	2		2	6		6	8			4		
Detector Phase	2	2	2	6	6	6	8	8		7	4	
Switch Phase												
Minimum Initial (s)	20.0	20.0	20.0	20.0	20.0	20.0	10.0	10.0		7.0	10.0	
Minimum Split (s)	25.5	25.5	25.5	25.5	25.5	25.5	23.5	23.5		10.0	23.5	
Total Split (s)	25.5	25.5	25.5	25.5	25.5	25.5	23.5	23.5		18.0	40.5	
Total Split (%)	38.1%	38.1%	38.1%	38.1%	38.1%	38.1%	35.1%	35.1%		26.9%	60.4%	
Maximum Green (s)	20.0	20.0	20.0	20.0	20.0	20.0	18.0	18.0		15.0	35.0	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		2.9	3.5	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		0.1	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5		3.0	5.5	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	Min	Min	Min	Min	Min	Min	None	None		None	None	

Clearwater Park Synchro 9 Report ISL

Lanes, Volumes, Timings
1: W Chestermere Dr/Windermere Blvd & Hwy 1A

	•	-	*	1	•	*	1	<b>†</b>	1	1	<b>↓</b>	4
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0			7.0	
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0			11.0	
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0			0	
Act Effct Green (s)	20.1	20.1	20.1	20.1	20.1	20.1	14.1	14.1		34.4	31.9	
Actuated g/C Ratio	0.32	0.32	0.32	0.32	0.32	0.32	0.22	0.22		0.55	0.51	
v/c Ratio	0.50	0.50	0.04	0.26	0.57	0.51	0.21	0.71		0.80	0.32	
Control Delay	26.8	22.0	0.1	20.3	23.7	5.1	21.9	27.5		21.3	4.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	26.8	22.0	0.1	20.3	23.7	5.1	21.9	27.5		21.3	4.1	
LOS	С	С	Α	С	С	Α	С	С		С	Α	
Approach Delay		22.3			14.4			26.7			14.7	
Approach LOS		С			В			С			В	
Queue Length 50th (m)	11.9	26.0	0.0	6.6	31.0	0.0	4.5	24.6		30.8	5.6	
Queue Length 95th (m)	29.0	49.4	0.0	17.4	57.8	16.8	12.0	47.6		#66.2	16.2	
Internal Link Dist (m)		198.2			130.7			107.0			109.7	
Turn Bay Length (m)	110.0		110.0	70.0		85.0	50.0					
Base Capacity (vph)	256	561	538	292	561	729	292	516		594	1012	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.50	0.50	0.04	0.26	0.57	0.51	0.16	0.57		0.79	0.29	
Intersection Summary												

Intersection Summary												
Area Type:	Other											
Cycle Length: 67												
Actuated Cycle Length: 63	3											
Natural Cycle: 60												
Control Type: Actuated-Uncoordinated												
Maximum v/c Ratio: 0.80												
Intersection Signal Delay:	Int	ersection	LOS: B									
Intersection Capacity Utiliz	IC	U Level o	f Service	F								
Analysis Period (min) 15												
# 95th percentile volume	e exceeds capa	acity, que	eue may l	e longer.								
Queue shown is maximum after two cycles.												

Splits and Phases: 1: W Chestermere Dr/Windermere Blvd & Hwy 1A



Lanes, Volumes, Timings
2: E Chestermere Dr/Cove Dr & Hwy 1A

Existing AM Peak

	۶	<b>→</b>	*	1	+	•	1	†	~	1	Ţ	<b>√</b>
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	*	44	7	*	44	7	*	13			ર્ન	7
Traffic Volume (vph)	19	848	69	48	344	16	185	4	99	99	10	94
Future Volume (vph)	19	848	69	48	344	16	185	4	99	99	10	94
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Storage Length (m)	60.0		50.0	75.0		20.0	60.0		0.0	0.0		40.0
Storage Lanes	1		1	1		1	1		0	0		1
Taper Length (m)	25.0			25.0			25.0			25.0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.856				0.850
Flt Protected	0.950			0.950			0.950				0.957	
Satd. Flow (prot)	1725	3451	1544	1709	3417	1529	1709	1540	0	0	1738	1544
Flt Permitted	0.534			0.271			0.682				0.670	
Satd, Flow (perm)	970	3451	1544	487	3417	1529	1227	1540	0	0	1217	1544
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			73			45		72				100
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		205.4			143.4			261.8			215.5	
Travel Time (s)		14.8			10.3			18.8			15.5	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	3%	3%	3%	4%	4%	4%	4%	4%	4%	3%	3%	3%
Adj. Flow (vph)	20	902	73	51	366	17	197	4	105	105	11	100
Shared Lane Traffic (%)				•								
Lane Group Flow (vph)	20	902	73	51	366	17	197	109	0	0	116	100
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
Turning Speed (k/h)	30		25	30		25	30		25	30		25
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6		6	8			4		4
Detector Phase	2	2	2	6	6	6	8	8		4	4	4
Switch Phase												
Minimum Initial (s)	20.0	20.0	20.0	20.0	20.0	20.0	10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	25.5	25.5	25.5	25.5	25.5	25.5	23.5	23.5		23.5	23.5	23.5
Total Split (s)	32.0	32.0	32.0	32.0	32.0	32.0	28.0	28.0		28.0	28.0	28.0
Total Split (%)	53.3%	53.3%	53.3%	53.3%	53.3%	53.3%	46.7%	46.7%		46.7%	46.7%	46.7%
Maximum Green (s)	26.5	26.5	26.5	26.5	26.5	26.5	22.5	22.5		22.5	22.5	22.5
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5			5.5	5.5
Lead/Lag												5.0
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	Min	Min	Min	Min	Min	Min	None	None		None	None	None

Clearwater Park Synchro 9 Report ISL

Lanes, Volumes, Timings
2: E Chestermere Dr/Cove Dr & Hwy 1A

Existing AM Peak

	•	-	7	1	•		1	<b>†</b>	-	1	ļ	1
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0		11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0		0	0	0
Act Effct Green (s)	23.7	23.7	23.7	23.7	23.7	23.7	13.7	13.7			13.7	13.7
Actuated g/C Ratio	0.49	0.49	0.49	0.49	0.49	0.49	0.28	0.28			0.28	0.28
v/c Ratio	0.04	0.54	0.09	0.22	0.22	0.02	0.57	0.22			0.34	0.20
Control Delay	8.5	10.8	3.2	11.7	8.4	1.1	21.6	7.3			16.3	4.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0
Total Delay	8.5	10.8	3.2	11.7	8.4	1.1	21.6	7.3			16.3	4.6
LOS	Α	В	Α	В	Α	Α	С	Α			В	Α
Approach Delay		10.2			8.5			16.5			10.9	
Approach LOS		В			Α			В			В	
Queue Length 50th (m)	0.7	23.5	0.0	2.1	7.8	0.0	12.4	2.0			6.8	0.0
Queue Length 95th (m)	4.2	51.4	5.5	9.8	19.3	1.0	31.2	10.8			18.7	7.5
Internal Link Dist (m)		181.4			119.4			237.8			191.5	
Turn Bay Length (m)	60.0		50.0	75.0		20.0	60.0					40.0
Base Capacity (vph)	542	1931	896	272	1912	875	577	763			573	780
Starvation Cap Reductn	0	0	0	0	0	0	0	0			0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0			0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0			0	0
Reduced v/c Ratio	0.04	0.47	0.08	0.19	0.19	0.02	0.34	0.14			0.20	0.13
Intersection Summary												
Area Type:	Other											

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 48.6
Natural Cycle: 50
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.57
Intersection Signal Delay: 10.9
Intersection Capacity Utilization 67.3%
Analysis Period (min) 15 Intersection LOS: B ICU Level of Service C

Splits and Phases: 2: E Chestermere Dr/Cove Dr & Hwy 1A ₩ Ø6 Ø8

Analysis Period (min)

Clearwater Park Synchro 9 Report ISL

15

### HCM Unsignalized Intersection Capacity Analysis

4: Hwy 1A & Hwy 1 NB On Ramp

Existing AM Peak

	•	-	<b>←</b>		1	4	
Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations	*	<b>^</b>	<b>†</b> }				
Traffic Volume (veh/h)	592	61	22	12	0	0	
Future Volume (Veh/h)	592	61	22	12	0	0	
Sign Control		Free	Free		Stop		
Grade		0%	0%		0%		
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	
Hourly flow rate (vph)	630	65	23	13	0	0	
Pedestrians							
Lane Width (m)							
Walking Speed (m/s)							
Percent Blockage							
Right turn flare (veh)							
Median type		None	None				
Median storage veh)							
Upstream signal (m)							
pX, platoon unblocked							
vC, conflicting volume	23				1322	18	
vC1, stage 1 conf vol					IOLL		
vC2, stage 2 conf vol							
vCu, unblocked vol	23				1322	18	
tC, single (s)	4.1				6.8	6.9	
tC, 2 stage (s)					0.0	0.0	
tF (s)	2.2				3.5	3.3	
p0 queue free %	60				100	100	
cM capacity (veh/h)	1591				89	1056	
		ED 0	ED 0	WD 4		1000	
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2		
	630	32	32	15	21		
Volume Left	630	0	0	0	0		
Volume Right	0	0	0	0	13		
cSH	1591	1700	1700	1700	1700		
Volume to Capacity	0.40	0.02	0.02	0.01	0.01		
Queue Length 95th (m)	14.7	0.0	0.0	0.0	0.0		
Control Delay (s)	8.7	0.0	0.0	0.0	0.0		
Lane LOS	A						
Approach Delay (s) Approach LOS	7.9			0.0			
Intersection Summary							
Average Delay			7.5				
Intersection Capacity Utiliza	ation		43.5%	IC	U Level c	of Service	А
Analysis Period (min)			15				

Clearwater Park Synchro 9 Report

ISL

## HCM Unsignalized Intersection Capacity Analysis

11	٠	-lw/v	791	ጼ	Hwv 1	1

Existing AM Peak

	٠	<b>→</b>	•	•	<b>←</b>	4	4	<b>†</b>	<b>/</b>	/	<b></b>	4
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBF
Lane Configurations	*	<b>^</b>	7	7	<b>†</b> \$			4			4	
Traffic Volume (veh/h)	1	567	54	47	1175	5	48	0	16	0	1	4
Future Volume (Veh/h)	1	567	54	47	1175	5	48	0	16	0	1	4
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	1	603	57	50	1250	5	51	0	17	0	1	4
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		Raised			Raised							
Median storage veh)		3			3							
Upstream signal (m)		=			-							
pX, platoon unblocked												
vC, conflicting volume	1255			660			1334	1960	302	1673	2014	628
vC1, stage 1 conf vol							605	605		1352	1352	
vC2, stage 2 conf vol							730	1355		320	662	
vCu, unblocked vol	1255			660			1334	1960	302	1673	2014	628
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			95			84	100	98	100	99	99
cM capacity (veh/h)	550			924			316	198	695	148	197	426
Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	NB 1	SB 1			
Volume Total	1	302	302	57	50	833	422	68	5			
Volume Left	1	0	0	0	50	0	0	51	0			
Volume Right	0	0	0	57	0	0	5	17	4			
cSH	550	1700	1700	1700	924	1700	1700	366	345			
Volume to Capacity	0.00	0.18	0.18	0.03	0.05	0.49	0.25	0.19	0.01			
Queue Length 95th (m)	0.0	0.0	0.0	0.0	1.3	0.0	0.0	5.1	0.3			
Control Delay (s)	11.6	0.0	0.0	0.0	9.1	0.0	0.0	17.1	15.6			
Lane LOS	В				Α			С	С			
Approach Delay (s)	0.0				0.3			17.1	15.6			
Approach LOS								С	С			
Intersection Summary												
Average Delay			0.8									
Intersection Capacity Utiliza	ation		57.2%	IC	CU Level	of Service			В			
Analysis Period (min)			15									

Clearwater Park Synchro 9 Report

Lanes, Volumes, Timings
1: W Chestermere Dr/Windermere Blvd & Hwy 1A

Existing PM Peak

1: W Chestermere	DI/VVIII	uenne	IC DIV	J CK I IV	vy TA						Existing P	IVI I CUIK
	•	<b>→</b>	•	1	•	*	1	<b>†</b>	1	1	ļ	1
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	*	<b>↑</b>	7	7	<b>↑</b>	7	7	1		7	1	
Traffic Volume (vph)	112	427	29	143	233	332	25	81	81	341	134	65
Future Volume (vph)	112	427	29	143	233	332	25	81	81	341	134	65
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Storage Length (m)	110.0		110.0	70.0		85.0	50.0		0.0	0.0		0.0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (m)	25.0			25.0			25.0			25.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.925			0.951	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1742	1834	1559	1742	1834	1559	1742	1696	0	1759	1761	0
Flt Permitted	0.607			0.381			0.627			0.479		
Satd. Flow (perm)	1113	1834	1559	699	1834	1559	1150	1696	0	887	1761	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			86			349		69			45	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		222.2			154.7			131.0			133.7	
Travel Time (s)		16.0			11.1			9.4			9.6	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehides (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	1%	1%	1%
Adj. Flow (vph)	118	449	31	151	245	349	26	85	85	359	141	68
Shared Lane Traffic (%)	110	110	01	101	210	010			00	000		
Lane Group Flow (vph)	118	449	31	151	245	349	26	170	0	359	209	0
Enter Blocked Intersection	No	No	No	No	No							
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	Lon	3.7	rtigitt	Lon	3.7	ragin	LOIL	3.7	rugiit	Loit	3.7	ragin
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane		1.0			1.0			1.0			1.0	
Headway Factor	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
Turning Speed (k/h)	30	1.02	25	30	1.02	25	30	1.02	25	30	1.02	25
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	20	pm+pt	NA	20
Protected Phases	I CIIII	2	I CIIII	I CIIII	6	I CIIII	1 61111	8		7	4	
Permitted Phases	2		2	6	U	6	8	Ü		4	7	
Detector Phase	2	2	2	6	6	6	8	8		7	4	
Switch Phase								· ·			7	
Minimum Initial (s)	20.0	20.0	20.0	20.0	20.0	20.0	10.0	10.0		7.0	10.0	
Minimum Split (s)	25.5	25.5	25.5	25.5	25.5	25.5	23.5	23.5		11.5	23.5	
Total Split (s)	33.5	33.5	33.5	33.5	33.5	33.5	23.5	23.5		13.0	36.5	
Total Split (%)	47.9%	47.9%	47.9%	47.9%	47.9%	47.9%	33.6%	33.6%		18.6%	52.1%	
Maximum Green (s)	28.0	28.0	28.0	28.0	28.0	28.0	18.0	18.0		10.0 %	31.0	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		2.9	3.5	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		0.1	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5		3.0	5.5	
	0.5	5.5	5.5	5.5	0.5	ა.5				Lead	5.5	
Lead/Lag							Lag Yes	Lag Yes		Yes		
Lead-Lag Optimize?	2.0	2.0	2.0	2.0	2.0	2.0	3.0			3.0	2.0	
Vehicle Extension (s)	3.0 Min	3.0 Min	3.0 Min	3.0 Min	3.0 Min	3.0 Min		3.0 None			3.0 None	
Recall Mode	iviin	IVIIN	Min	IVIIN	Min	Min	None	None		None	None	

## Lanes, Volumes, Timings

### 1: W Chestermere Dr/Windermere Blvd & Hwy 1A

	•	-	*	1	<b>←</b>	•	1	Ť		-	<b>↓</b>	4
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0			7.0	
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0			11.0	
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0			0	
Act Effct Green (s)	23.0	23.0	23.0	23.0	23.0	23.0	11.1	11.1		23.5	21.0	
Actuated g/C Ratio	0.42	0.42	0.42	0.42	0.42	0.42	0.20	0.20		0.42	0.38	
v/c Ratio	0.25	0.59	0.04	0.52	0.32	0.41	0.11	0.43		0.65	0.30	
Control Delay	13.8	17.4	0.1	21.6	13.5	3.3	22.0	17.6		18.5	10.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	13.8	17.4	0.1	21.6	13.5	3.3	22.0	17.6		18.5	10.7	
LOS	В	В	Α	С	В	Α	С	В		В	В	
Approach Delay		15.8			10.3			18.2			15.7	
Approach LOS		В			В			В			В	
Queue Length 50th (m)	7.8	35.2	0.0	11.4	16.7	0.0	2.2	8.6		21.5	9.5	
Queue Length 95th (m)	19.1	65.6	0.2	29.8	33.7	12.8	8.3	25.5		#49.1	25.6	
Internal Link Dist (m)		198.2			130.7			107.0			109.7	
Turn Bay Length (m)	110.0		110.0	70.0		85.0	50.0					
Base Capacity (vph)	579	953	851	363	953	978	384	613		550	1033	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.20	0.47	0.04	0.42	0.26	0.36	0.07	0.28		0.65	0.20	

# Intersection Summary Area Type: Other Area Type: Other Cycle Length: 70 Actuated Cycle Length: 55.3 Natural Cycle: 65 Control Type: Actuated-Uncoordinated Maximum v/c Ratio: 0.65 Intersection Signal Delay: 14.1

Intersection LOS: B ICU Level of Service E

Intersection Signal Delay: 14.1 Intersection Capacity Utilization 85.7% ICU

Analysis Period (min) 15

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 1: W Chestermere Dr/Windermere Blvd & Hwy 1A



Clearwater Park Synchro 9 Report ISL

Lanes, Volumes, Timings

2: E Chestermere Dr/Cove Dr & Hwy 1A

Existing PM Peak

2: E Chestermere L	JI/COVE	שוט	nwy i	A							Existing F	IVI Feak
	۶	<b>→</b>	*	•	•	•	1	<b>†</b>	1	-	ţ	1
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	*	<b>^</b>	7	1	<b>^</b>	7	7	1			4	7
Traffic Volume (vph)	105	556	204	90	443	59	179	18	80	42	11	72
Future Volume (vph)	105	556	204	90	443	59	179	18	80	42	11	72
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Storage Length (m)	60.0		50.0	75.0		20.0	60.0		0.0	0.0		40.0
Storage Lanes	1		1	1		1	1		0	0		1
Taper Length (m)	25.0			25.0			25.0			25.0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.878				0.850
Flt Protected	0.950			0.950			0.950				0.962	
Satd. Flow (prot)	1725	3451	1544	1725	3451	1544	1759	1626	0	0	1747	1544
Flt Permitted	0.484			0.431			0.720				0.707	
Satd. Flow (perm)	879	3451	1544	783	3451	1544	1333	1626	0	0	1284	1544
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			215			62		84				76
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		205.4			143.4			261.8			215.5	
Travel Time (s)		14.8			10.3			18.8			15.5	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehides (%)	3%	3%	3%	3%	3%	3%	1%	1%	1%	3%	3%	3%
Adj. Flow (vph)	111	585	215	95	466	62	188	19	84	44	12	76
Shared Lane Traffic (%)							,,,,					
Lane Group Flow (vph)	111	585	215	95	466	62	188	103	0	0	56	76
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	Lon	3.7	rugiit	Loit	3.7	rugiit	Lon	3.7	rugin	Lon	3.7	rugin
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane		110						110				
Headway Factor	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
Turning Speed (k/h)	30	1102	25	30		25	30	1102	25	30	1102	25
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases	1 01111	2	1 01111	1 01111	6	1 01111	1 01111	8		1 01111	4	1 01111
Permitted Phases	2		2	6	Ŭ	6	8			4		4
Detector Phase	2	2	2	6	6	6	8	8		4	4	4
Switch Phase	_			·	, ,	Ŭ	Ŭ					
Minimum Initial (s)	20.0	20.0	20.0	20.0	20.0	20.0	10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	25.5	25.5	25.5	25.5	25.5	25.5	24.5	24.5		23.5	23.5	23.5
Total Split (s)	32.0	32.0	32.0	32.0	32.0	32.0	28.0	28.0		28.0	28.0	28.0
Total Split (%)	53.3%	53.3%	53.3%	53.3%	53.3%	53.3%	46.7%	46.7%		46.7%	46.7%	46.7%
Maximum Green (s)	26.5	26.5	26.5	26.5	26.5	26.5	22.5	22.5		22.5	22.5	22.5
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		2.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5			5.5	5.5
Lead/Lag	5.5	5.5	5.5	5.5	5.5	5.5	0.0	5.5			5.5	5.5
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	Min	Min	Min	Min	Min	Min	None	None		None	None	None
Necal Mode	IVIIII	IVIIII	IVIIII	IVIIII	IVIIII	IVIIII	HUHE	NOHE		INOHE	NULLE	INOITE

Lanes, Volumes, Timings
2: E Chestermere Dr/Cove Dr & Hwy 1A

	•	$\rightarrow$	*	1		•	1	Ť	1	-	¥	4
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0		11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0		0	0	0
Act Effct Green (s)	25.8	25.8	25.8	25.8	25.8	25.8	12.5	12.5			12.5	12.5
Actuated g/C Ratio	0.58	0.58	0.58	0.58	0.58	0.58	0.28	0.28			0.28	0.28
v/c Ratio	0.22	0.29	0.22	0.21	0.23	0.07	0.51	0.20			0.16	0.16
Control Delay	9.6	7.9	2.3	9.7	7.6	3.0	19.2	6.0			13.5	4.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0
Total Delay	9.6	7.9	2.3	9.7	7.6	3.0	19.2	6.0			13.5	4.8
LOS	Α	Α	Α	Α	Α	Α	В	Α			В	Α
Approach Delay		6.8			7.4			14.5			8.5	
Approach LOS		Α			Α			В			Α	
Queue Length 50th (m)	4.3	12.5	0.0	3.7	9.6	0.0	11.5	1.0			3.1	0.0
Queue Length 95th (m)	15.4	28.7	8.7	13.9	22.6	4.7	29.0	9.1			10.3	6.7
Internal Link Dist (m)		181.4			119.4			237.8			191.5	
Turn Bay Length (m)	60.0		50.0	75.0		20.0	60.0					40.0
Base Capacity (vph)	589	2311	1105	524	2311	1054	679	870			654	824
Starvation Cap Reductn	0	0	0	0	0	0	0	0			0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0			0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0			0	0
Reduced v/c Ratio	0.19	0.25	0.19	0.18	0.20	0.06	0.28	0.12			0.09	0.09
Intersection Summary												
Area Type:	Other											
0 1 1 11 00												

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 44.8
Natural Cycle: 50
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.51
Intersection Signal Delay: 8.3
Intersection Capacity Utilization 63.9%
Analysis Period (min) 15 Intersection LOS: A ICU Level of Service B

Splits and Phases: 2: E Chestermere Dr/Cove Dr & Hwy 1A



Clearwater Park Synchro 9 Report

# HCM Unsignalized Intersection Capacity Analysis 3: Hwy 1 SB On Ramp/Hwy 1 SB Off Ramp & Hwy 1A

Existing P	M	Pea
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	*	-	*	1	•	*	1	<b>†</b>	-	1	<b>↓</b>	4
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBF
Lane Configurations		<b>†</b>		*	<b>^</b>					7		7
Traffic Volume (veh/h)	0	305	308	7	224	0	0	0	0	30	0	368
Future Volume (Veh/h)	0	305	308	7	224	0	0	0	0	30	0	368
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	321	324	7	236	0	0	0	0	32	0	387
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												-
Median type		None			None							
Median storage veh)												
Upstream signal (m)		143										
pX, platoon unblocked				0.96			0.96	0.96	0.96	0.96	0.96	
vC, conflicting volume	236			321			615	733	322	410	571	118
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	236			214			520	643	216	307	474	118
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			100	100	100	95	100	58
cM capacity (veh/h)	1328			1301			242	373	758	596	466	912
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	SB 1						
Volume Total	214	431	7	118	118	419						
Volume Left	0	0	7	0	0	32						
Volume Right	0	324	0	0	0	387						
cSH	1700	1700	1301	1700	1700	987						
Volume to Capacity	0.13	0.25	0.01	0.07	0.07	0.42						
Queue Length 95th (m)	0.0	0.0	0.1	0.0	0.0	16.3						
Control Delay (s)	0.0	0.0	7.8	0.0	0.0	11.8						
Lane LOS			Α			В						
Approach Delay (s)	0.0		0.2			11.8						
Approach LOS						В						
Intersection Summary												
Average Delay			3.8									
Intersection Capacity Utiliza	tion		36.4%	IC	U Level o	f Service			Α			
Analysis Period (min)			15									

	•	<b>→</b>	•	*	1	4
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	75	<b>^</b>	<b>†</b> 1>			
Traffic Volume (veh/h)	258	77	35	4	0	0
Future Volume (Veh/h)	258	77	35	4	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	272	81	37	4	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)		,				
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	37				624	20
vC1, stage 1 conf vol	0.				02.	
vC2, stage 2 conf vol						
vCu, unblocked vol	37				624	20
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					0.0	0.0
tF (s)	2.2				3.5	3.3
p0 queue free %	83				100	100
cM capacity (veh/h)	1572				345	1052
Direction. Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	1002
Volume Total	272	40	40	25	16	
	272	40	40	25 0	0	
Volume Left		0	-	0	4	
Volume Right	0		0			
cSH	1572	1700	1700	1700	1700	
Volume to Capacity	0.17	0.02	0.02	0.01	0.01	
Queue Length 95th (m)	4.8	0.0	0.0	0.0	0.0	
Control Delay (s)	7.8	0.0	0.0	0.0	0.0	
Lane LOS	Α					
Approach Delay (s)	6.0			0.0		
Approach LOS						
Intersection Summary						
Average Delay			5.4			
Intersection Capacity Utiliz	zation		24.7%	IC	CU Level o	of Service
Analysis Period (min)			15			
,						

Clearwater Park Synchro 9 Report

ISL

## HCM Unsignalized Intersection Capacity Analysis

11: Hwv 1 & Hwv 791	11	١٠	Hwy	1	ጼ	Hwv	791	
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Existing PM Peak

Movement   EBL   EBT   EBR   WBL   WBT   WBR   NBL   NBT   NBR   SBL		-
Lane Configurations Traffic Volume (veh/h) 4 1044 101 30 631 2 64 3 32 1 Future Volume (Veh/h) 4 1044 101 30 631 2 64 3 32 1 Sign Control Free Grade 0% 0% 0% 0% 0% Peak Hour Factor 0,95 0,95 0,95 0,95 0,95 0,95 0,95 0,95	SBT	SB
Traffic Volume (veh/h)	4	OD
Future Volume (Vehrh)	1	
Sign Control         Free Grade         Free Owner         Stop Owner           Grade         0%         0%         0%           Peak Hour Factor         0,95	1	
Grade 0,% 0,% 0,% 0,% 0,% 0,% 0,% 0,% 0,% 0,%	Stop	
Peak Hour Factor         0.95	0%	
Hourly flow rate (vph) 4 1099 106 32 664 2 67 3 34 1 Pedestrians Lane Width (m) Walking Speed (m/s) Percent Blockage Right turn flare (veh) Median type Raised Raised Median storage veh) 3 3 Upstream signal (m) px, platoon unblocked vC, conflicting volume 666 1205 1508 1837 550 1322 vC1, stage 1 conf vol 1107 1107 729 vC2, stage 2 conf vol 400 730 593 vCu, unblocked vol 666 1205 1508 1837 550 1322 vC1, single (s) 4.1 4.1 7.5 6.5 6.9 7.5	0.95	0.9
Pedestrians Lane Width (m) Walking Speed (m/s) Percent Blockage Right turn flare (veh) Median type Raised Raised Median storage veh) 3 3 Upstream signal (m) pX, platoon unblocked vC, conflicting volume 666 1205 1508 1837 550 1322 vC1, stage 1 conf vol 1107 1107 729 vC2, stage 2 conf vol 400 730 593 vCu, unblocked vol 666 1205 1508 1837 550 1322 CC, single (s) 4.1 4.1 7.5 6.5 6.9 7.5	1	
Walking Speed (m/s)         Percent Blockage         Right turn flare (veh)         Median storage veh)       3       3         Upstream signal (m)         bX, platoon unblocked         vC, conflicting volume       666       1205       1508       1837       550       1322         vC1, stage 1 conf vol       400       730       593         vC2, stage 2 conf vol       400       730       593         vC2, unblocked vol       666       1205       1508       1837       550       1322         vC2, single (s)       4.1       4.1       7.5       6.5       6.9       7.5		
Percent Blockage         Right turn flare (veh)       Raised       Raised         Median storage veh)       3       3         Upstream signal (m)       PX, platoon unblocked         vC, conflicting volume       666       1205       1508       1837       550       1322         vC1, stage 1 conf vol       400       730       593         vC2, stage 2 conf vol       400       730       593         vCu, unblocked vol       666       1205       1508       1837       550       1322         1C, single (s)       4.1       4.1       7.5       6.5       6.9       7.5		
Percent Blockage       Right turn flare (veh)     Raised       Median storage veh)     3     3       Upstream signal (m)     Vec. conflicting volume     666     1205     1508     1837     550     1322       VC1, stage 1 conf vol     1107     1107     729       VC2, stage 2 conf vol     400     730     593       VC0, unblocked vol     666     1205     1508     1837     550     1322       1C, single (s)     4.1     4.1     7.5     6.5     6.9     7.5		
Median type         Raised         Raised           Median storage veh)         3         3           Upstream signal (m)         Very Stream signal (m)         Very Stream signal (m)           pX, platoon unblocked         Very Stream S		
Median storage veh)     3     3       Upstream signal (m)     50       yx, platoon unblocked     70       vC, conflicting volume     666     1205     1508     1837     550     1322       vC1, stage 1 conf vol     1107     1107     170     729       vC2, stage 2 conf vol     400     730     593       vCu, unblocked vol     666     1205     1508     1837     550     1322       tC, single (s)     4.1     4.1     7.5     6.5     6.9     7.5		
Upstream signal (m)       pX, platoon unblocked       vC, conflicting volume     666     1205     1508     1837     550     1322       vC1, stage 1 conf vol     1107     1107     1729       vC2, stage 2 conf vol     400     730     593       vCu, unblocked vol     666     1205     1508     1837     550     1322       tC, single (s)     4.1     4.1     7.5     6.5     6.9     7.5		
pX, platoon unblocked vC, conflicting volume 666 1205 1508 1837 550 1322 vC1, stage 1 conf vol 1107 1107 729 vC2, stage 2 conf vol 400 730 593 vCu, unblocked vol 666 1205 1508 1837 550 1322 tC, single (s) 4.1 4.1 7.5 6.5 6.9 7.5		
VC, conflicting volume         666         1205         1508         1837         550         1322           vC1, stage 1 conf vol         1107         1107         729           vC2, stage 2 conf vol         400         730         593           vCu, unblocked vol         666         1205         1508         1837         550         1322           tC, single (s)         4.1         4.1         7.5         6.5         6.9         7.5		
vC1, stage 1 conf vol 1107 1107 729 vC2, stage 2 conf vol 400 730 593 vCu, unblocked vol 666 1205 1508 1837 550 1322 vC, single (s) 4.1 4.1 7.5 6.5 6.9 7.5		
vC2, stage 2 conf vol     400     730     593       vCu, unblocked vol     666     1205     1508     1837     550     1322       tC, single (s)     4.1     4.1     7.5     6.5     6.9     7.5	1942	33
vCu, unblocked vol 666 1205 1508 1837 550 1322 tC, single (s) 4.1 4.1 7.5 6.5 6.9 7.5	729	
tC, single (s) 4.1 4.1 7.5 6.5 6.9 7.5	1213	
	1942	33
10 0 -1 (-)	6.5	6
	5.5	
tF(s) 2.2 2.2 3.5 4.0 3.3 3.5	4.0	3
p0 queue free % 100 94 69 99 93 100	100	9
cM capacity (veh/h) 919 575 219 256 479 302	209	66
Direction, Lane # EB 1 EB 2 EB 3 EB 4 WB 1 WB 2 WB 3 NB 1 SB 1		
Volume Total 4 550 550 106 32 443 223 104 6		
Volume Left 4 0 0 0 32 0 0 67 1		
Volume Right 0 0 0 106 0 0 2 34 4		
cSH 919 1700 1700 1700 575 1700 1700 267 425		
Volume to Capacity 0.00 0.32 0.32 0.06 0.06 0.26 0.13 0.39 0.01		
Queue Length 95th (m) 0.1 0.0 0.0 0.0 1.3 0.0 0.0 13.4 0.3		
Control Delay (s) 8.9 0.0 0.0 0.0 11.6 0.0 0.0 26.8 13.6		
Lane LOS A B D B		
Approach Delay (s)         0.0         0.5         26.8         13.6           Approach LOS         D         B		
Intersection Summary		
Average Delay 1.6		
Intersection Capacity Utilization 48.8% ICU Level of Service A		
Analysis Period (min) 15		

Lanes, Volumes, Timings
1: W Chestermere Dr/Windermere Blvd & Hwy 1A

2023 Background AM Peak

	۶	<b>→</b>	7	1	+	•	1	<b>†</b>	<i>&gt;</i>	<b>/</b>	Ţ	<b>√</b>
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	*	<b>†</b>	1	*	<b>^</b>	7		4	7	*	ĵ.	
Traffic Volume (vph)	130	287	23	79	333	381	48	162	144	486	102	204
Future Volume (vph)	130	287	23	79	333	381	48	162	144	486	102	204
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Storage Length (m)	110.0	1000	110.0	70.0	1000	85.0	50.0	1000	60.0	0.0	1000	0.0
Storage Lanes	1		1	1		1	0		1	1		0.0
Taper Length (m)	25.0			25.0		•	25.0			25.0		Ū
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.850	1.00	1.00	0.850	1.00	1.00	0.850	1.00	0.900	1.00
Flt Protected	0.950		0.000	0.950		0.000		0.989	0.000	0.950	0.000	
Satd. Flow (prot)	1742	1834	1559	1742	1834	1559	0	1814	1559	1742	1650	0
Flt Permitted	0.311	1001	1000	0.454	1001	1000		0.830	1000	0.388	1000	ŭ
Satd. Flow (perm)	570	1834	1559	833	1834	1559	0	1522	1559	712	1650	0
Right Turn on Red	0,0	1001	Yes	000	1001	Yes		IOLL	Yes		1000	Yes
Satd. Flow (RTOR)			109			405			153		161	100
Link Speed (k/h)		50	100		50	100		50	100		50	
Link Distance (m)		222.2			154.7			241.2			133.7	
Travel Time (s)		16.0			11.1			17.4			9.6	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adi. Flow (vph)	138	305	24	84	354	405	51	172	153	517	109	217
Shared Lane Traffic (%)	100	000	27	04	004	700	01	112	100	017	103	217
Lane Group Flow (vph)	138	305	24	84	354	405	0	223	153	517	326	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	Lon	3.7	rugiii	Lon	3.7	rugiit	Lon	3.7	rugin	Loit	3.7	rugin
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
Turning Speed (k/h)	30		25	30		25	30		25	30		25
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	
Protected Phases	5	2		1	6			8		7	4	
Permitted Phases	2	_	2	6		6	8		8	4		
Detector Phase	5	2	2	1	6	6	8	8	8	7	4	
Switch Phase	=	_	=		_	=	-	-	-		-	
Minimum Initial (s)	7.0	20.0	20.0	7.0	20.0	20.0	10.0	10.0	10.0	7.0	10.0	
Minimum Split (s)	10.0	25.5	25.5	10.0	25.5	25.5	23.5	23.5	23.5	22.5	23.5	
Total Split (s)	10.0	29.0	29.0	10.0	29.0	29.0	23.5	23.5	23.5	22.5	46.0	
Total Split (%)	11.8%	34.1%	34.1%	11.8%	34.1%	34.1%	27.6%	27.6%	27.6%	26.5%	54.1%	
Maximum Green (s)	7.0	23.5	23.5	7.0	23.5	23.5	18.0	18.0	18.0	19.5	40.5	
Yellow Time (s)	2.9	3.5	3.5	2.9	3.5	3.5	3.5	3.5	3.5	2.9	3.5	
All-Red Time (s)	0.1	2.0	2.0	0.1	2.0	2.0	2.0	2.0	2.0	0.1	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	
Total Lost Time (s)	3.0	5.5	5.5	3.0	5.5	5.5		5.5	5.5	3.0	5.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lead	0.0	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None	
Walk Time (s)		7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0	7.0	

Synchro 9 Report Clearwater Park ISL

Lanes, Volumes, Timings

1: W Chestermere Dr/Windermere Blvd & Hwy 1A

2023 Background AM Peak

		$\rightarrow$	*	1			7			-	+	*
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Flash Dont Walk (s)		11.0	11.0		11.0	11.0	11.0	11.0	11.0	11.0	11.0	
Pedestrian Calls (#/hr)		0	0		0	0	0	0	0	0	0	
Act Effct Green (s)	32.1	24.1	24.1	31.5	21.9	21.9		15.4	15.4	40.5	38.0	
Actuated g/C Ratio	0.40	0.30	0.30	0.39	0.27	0.27		0.19	0.19	0.50	0.47	
v/c Ratio	0.42	0.56	0.04	0.21	0.71	0.56		0.77	0.36	0.86	0.38	
Control Delay	19.5	30.3	0.2	16.2	36.3	6.2		50.1	7.8	31.1	8.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	
Total Delay	19.5	30.3	0.2	16.2	36.3	6.2		50.1	7.8	31.1	8.1	
LOS	В	С	Α	В	D	Α		D	Α	С	Α	
Approach Delay		25.6			19.8			32.9			22.2	
Approach LOS		С			В			С			С	
Queue Length 50th (m)	13.4	42.5	0.0	7.9	50.9	0.0		33.2	0.0	54.6	14.6	
Queue Length 95th (m)	25.0	68.4	0.0	16.4	80.6	19.9		#62.9	14.4	#96.5	32.0	
Internal Link Dist (m)		198.2			130.7			217.2			109.7	
Turn Bay Length (m)	110.0		110.0	70.0		85.0			60.0			
Base Capacity (vph)	327	566	556	402	534	741		339	466	604	908	
Starvation Cap Reductn	0	0	0	0	0	0		0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0		0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0		0	0	0	0	
Reduced v/c Ratio	0.42	0.54	0.04	0.21	0.66	0.55		0.66	0.33	0.86	0.36	
Intersection Summary												

Area Type: Other
Cycle Length: 85
Actuated Cycle Length: 81
Natural Cycle: 85
Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.86
Intersection Signal Delay: 23.6
Intersection Capacity Utilization 81.6% Intersection LOS: C ICU Level of Service D

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 1: W Chestermere Dr/Windermere Blvd & Hwy 1A



Lanes, Volumes, Timings
2: E Chestermere Dr/Cove Dr & Hwy 1A

2023 Background AM Peak

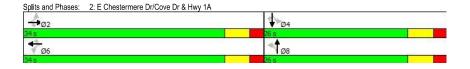
	۶	<b>→</b>	•	•	+	•	1	<b>†</b>	~	/	<b></b>	4
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	*	<b>^</b>	7	*	44	7	*	1>			4	7
Traffic Volume (vph)	20	932	75	52	378	17	203	4	108	108	11	103
Future Volume (vph)	20	932	75	52	378	17	203	4	108	108	11	103
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Storage Length (m)	60.0		50.0	75.0		20.0	60.0		0.0	0.0		40.0
Storage Lanes	1		1	1		1	1		0	0		1
Taper Length (m)	25.0			25.0			25.0			25.0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.855				0.850
Flt Protected	0.950			0.950			0.950				0.957	
Satd. Flow (prot)	1742	3484	1559	1742	3484	1559	1742	1568	0	0	1755	1559
Flt Permitted	0.515			0.231			0.676				0.663	
Satd. Flow (perm)	944	3484	1559	424	3484	1559	1240	1568	0	0	1216	1559
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			80			45		67				110
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		205.4			143.4			261.8			215.5	
Travel Time (s)		14.8			10.3			18.8			15.5	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	21	991	80	55	402	18	216	4	115	115	12	110
Shared Lane Traffic (%)												
Lane Group Flow (vph)	21	991	80	55	402	18	216	119	0	0	127	110
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
Turning Speed (k/h)	30		25	30		25	30		25	30		25
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6		6	8			4		4
Detector Phase	2	2	2	6	6	6	8	8		4	4	4
Switch Phase												
Minimum Initial (s)	20.0	20.0	20.0	20.0	20.0	20.0	10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	25.5	25.5	25.5	25.5	25.5	25.5	23.5	23.5		23.5	23.5	23.5
Total Split (s)	34.0	34.0	34.0	34.0	34.0	34.0	26.0	26.0		26.0	26.0	26.0
Total Split (%)	56.7%	56.7%	56.7%	56.7%	56.7%	56.7%	43.3%	43.3%		43.3%	43.3%	43.3%
Maximum Green (s)	28.5	28.5	28.5	28.5	28.5	28.5	20.5	20.5		20.5	20.5	20.5
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5			5.5	5.5
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	Min	Min	Min	Min	Min	Min	None	None		None	None	None
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0		7.0	7.0	7.0

Clearwater Park Synchro 9 Report ISL

Lanes, Volumes, Timings
2: E Chestermere Dr/Cove Dr & Hwy 1A

2023 Background AM Peak

	•	<b>→</b>	•	•	•	•	1	†	1	-	ļ	4
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBF
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0		11.0	11.0	11.
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0		0	0	(
Act Effct Green (s)	23.6	23.6	23.6	23.6	23.6	23.6	14.1	14.1			14.1	14.
Actuated g/C Ratio	0.48	0.48	0.48	0.48	0.48	0.48	0.29	0.29			0.29	0.29
v/c Ratio	0.05	0.59	0.10	0.27	0.24	0.02	0.61	0.24			0.36	0.2
Control Delay	8.2	11.4	2.9	13.0	8.4	1.2	23.7	8.7			17.8	4.
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0
Total Delay	8.2	11.4	2.9	13.0	8.4	1.2	23.7	8.7			17.8	4.7
LOS	Α	В	Α	В	Α	Α	С	Α			В	- 1
Approach Delay		10.7			8.6			18.4			11.8	
Approach LOS		В			Α			В			В	
Queue Length 50th (m)	0.8	28.3	0.0	2.5	9.2	0.0	14.7	3.0			7.9	0.0
Queue Length 95th (m)	4.1	55.4	5.4	10.6	20.2	1.1	36.3	13.0			21.6	8.4
Internal Link Dist (m)		181.4			119.4			237.8			191.5	
Turn Bay Length (m)	60.0		50.0	75.0		20.0	60.0					40.0
Base Capacity (vph)	563	2079	962	253	2079	948	532	711			522	732
Starvation Cap Reductn	0	0	0	0	0	0	0	0			0	(
Spillback Cap Reductn	0	0	0	0	0	0	0	0			0	(
Storage Cap Reductn	0	0	0	0	0	0	0	0			0	(
Reduced v/c Ratio	0.04	0.48	0.08	0.22	0.19	0.02	0.41	0.17			0.24	0.15
Intersection Summary												
	Other											
Cycle Length: 60												
Actuated Cycle Length: 49												
Natural Cycle: 50												
Control Type: Actuated-Unc	oordinated											
Maximum v/c Ratio: 0.61												
Intersection Signal Delay: 1	1.6			In	tersectior	LOS: B						
Intersection Capacity Utiliza	tion 71.8%			IC	U Level o	of Service	С					
Analysis Period (min) 15												



	۶	<b>→</b>	*	1	•	*	1	<b>†</b>	-	-	ļ	1
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		<b>^</b>	7	7	<b>^</b>					7		7
Traffic Volume (veh/h)	0	702	133	1	165	0	0	0	0	15	0	95
Future Volume (Veh/h)	0	702	133	1	165	0	0	0	0	15	0	95
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	0	747	141	1	176	0	0	0	0	16	0	101
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												7
Median type		None			None							
Median storage veh)												
Upstream signal (m)		143										
pX, platoon unblocked				0.97			0.97	0.97	0.97	0.97	0.97	
vC, conflicting volume	176			747			837	925	374	552	925	88
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	176			685			777	868	301	484	868	88
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)								0.0	0.0	,,,,		0.0
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	96	100	89
cM capacity (veh/h)	1398			880			249	281	677	453	281	953
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1		•••			
Volume Total	374	374	141	1	88	88	117					
Volume Left	0	0	0	1	00	0	16					
Volume Right	0	0	141	0	0	0	101					
cSH	1700	1700	1700	880	1700	1700	1104					
Volume to Capacity	0.22	0.22	0.08	0.00	0.05	0.05	0.11					
Queue Length 95th (m)	0.22	0.22	0.0	0.00	0.05	0.05	2.7					
Control Delay (s)	0.0	0.0	0.0	9.1	0.0	0.0	9.8					
Lane LOS	0.0	0.0	0.0	9.1 A	0.0	0.0	9.8 A					
	0.0						9.8					
Approach Delay (s) Approach LOS	0.0			0.1			9.0 A					
Intersection Summary												
Average Delay			1.0									
Intersection Capacity Utiliza	tion		29.9%	IC	U Level	of Service			Α			
Analysis Period (min)			15									

Clearwater Park Synchro 9 Report

# HCM Unsignalized Intersection Capacity Analysis 4: Hwy 1A & Hwy 1 NB On Ramp

2023 Background AM Peak

	۶	-	•	*	1	4	
Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations	*	<b>^</b>	<b>†</b> 1>				
Traffic Volume (veh/h)	651	67	24	13	0	0	
Future Volume (Veh/h)	651	67	24	13	0	0	
Sign Control		Free	Free		Stop		
Grade		0%	0%		0%		
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	
Hourly flow rate (vph)	693	71	26	14	0	0	
Pedestrians							
Lane Width (m)							
Walking Speed (m/s)							
Percent Blockage							
Right turn flare (veh)							
Median type		None	None				
Median storage veh)							
Upstream signal (m)							
pX, platoon unblocked							
vC, conflicting volume	26				1454	20	
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	26				1454	20	
tC, single (s)	4.1				6.8	6.9	
tC, 2 stage (s)						0.0	
tF (s)	2.2				3.5	3.3	
p0 queue free %	56				100	100	
cM capacity (veh/h)	1587				68	1053	
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2		
Volume Total	693	36	36	17	23		
Volume Left	693	0	0	0	0		
Volume Right	093	0	0	0	14		
cSH	1587	1700	1700	1700	1700		
Volume to Capacity	0.44	0.02	0.02	0.01	0.01		
Queue Length 95th (m)	17.3	0.02	0.02	0.0	0.01		
Control Delay (s)	9.0	0.0	0.0	0.0	0.0		
Lane LOS	9.0 A	0.0	0.0	0.0	0.0		
Approach Delay (s)	8.2			0.0			
Approach LOS	0.2			0.0			
Intersection Summary							
Average Delay			7.8				
Intersection Capacity Utilizat	ion		45.4%	IC	U Level c	of Service	А
Analysis Period (min)			15				

# HCM Unsignalized Intersection Capacity Analysis 11: Highway 791 & Highway 1

2023 Background AM Peak

	۶	<b>→</b>	*	•	<b>←</b>	•	1	1	~	-	ļ	1
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	*	<b>^</b>	7	7	<b>↑</b> ↑			4			4	
Traffic Volume (veh/h)	1	623	59	51	1292	5	52	0	17	0	1	4
Future Volume (Veh/h)	1	623	59	51	1292	5	52	0	17	0	1	4
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	1	663	63	54	1374	5	55	0	18	0	1	4
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		Raised			Raised							
Median storage veh)		3			3							
Upstream signal (m)		=			=							
pX, platoon unblocked												
vC, conflicting volume	1379			726			1464	2152	332	1836	2212	690
vC1, stage 1 conf vol	1010			. 20			665	665	002	1484	1484	000
vC2, stage 2 conf vol							800	1487		352	728	
vCu, unblocked vol	1379			726			1464	2152	332	1836	2212	690
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)	7.1			7.1			6.5	5.5	0.0	6.5	5.5	0.5
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			94			81	100	97	100	99	99
cM capacity (veh/h)	493			873			283	170	664	122	169	388
										122	105	300
Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	NB 1	SB 1			
Volume Total	1	332	332	63	54	916	463	73	5			
Volume Left	1	0	0	0	54	0	0	55	0			
Volume Right	0	0	0	63	0	0	5	18	4			
cSH	493	1700	1700	1700	873	1700	1700	330	308			
Volume to Capacity	0.00	0.20	0.20	0.04	0.06	0.54	0.27	0.22	0.02			
Queue Length 95th (m)	0.0	0.0	0.0	0.0	1.5	0.0	0.0	6.3	0.4			
Control Delay (s)	12.3	0.0	0.0	0.0	9.4	0.0	0.0	19.0	16.9			
Lane LOS	В				Α			С	С			
Approach Delay (s)	0.0				0.4			19.0	16.9			
Approach LOS								С	С			
Intersection Summary												
Average Delay			0.9									
Intersection Capacity Utiliza	ition		60.9%	I	CU Level	of Service			В			
Analysis Period (min)			15	•		2200						
) 5.0 1 5.100 (111)			.5									

Clearwater Park Synchro 9 Report

Lanes, Volumes, Timings
1: W Chestermere Dr/Windermere Blvd & Hwy 1A

2023 Background PM Peak

	•	<b>→</b>	7	1	<b>←</b>	*	1	†	1	-	ļ	4
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	7	<b>^</b>	7	7	<b>^</b>	7		ર્ન	7	7	ĵ.	
Traffic Volume (vph)	123	469	31	157	256	365	27	89	89	375	147	71
Future Volume (vph)	123	469	31	157	256	365	27	89	89	375	147	71
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Storage Length (m)	110.0		110.0	70.0		85.0	50.0		60.0	0.0		0.0
Storage Lanes	1		1	1		1	0		1	1		0
Taper Length (m)	25.0			25.0			25.0			25.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850		0.951	
Flt Protected	0.950			0.950				0.989		0.950		
Satd. Flow (prot)	1742	1834	1559	1742	1834	1559	0	1814	1559	1742	1744	0
Flt Permitted	0.538			0.171				0.864		0.543		
Satd. Flow (perm)	987	1834	1559	314	1834	1559	0	1584	1559	996	1744	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			109			384			109		39	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		222.2			154.7			241.2			133.7	
Travel Time (s)		16.0			11.1			17.4			9.6	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	129	494	33	165	269	384	28	94	94	395	155	75
Shared Lane Traffic (%)												
Lane Group Flow (vph)	129	494	33	165	269	384	0	122	94	395	230	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
Turning Speed (k/h)	30		25	30		25	30		25	30		25
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	
Protected Phases	5	2		1	6			8		7	4	
Permitted Phases	2		2	6		6	8		8	4		
Detector Phase	5	2	2	1	6	6	8	8	8	7	4	
Switch Phase												
Minimum Initial (s)	7.0	20.0	20.0	7.0	20.0	20.0	10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	10.0	25.5	25.5	10.0	25.5	25.5	23.5	23.5	23.5	22.5	23.5	
Total Split (s)	10.0	29.0	29.0	10.0	29.0	29.0	23.5	23.5	23.5	22.5	46.0	
Total Split (%)	11.8%	34.1%	34.1%	11.8%	34.1%	34.1%	27.6%	27.6%	27.6%	26.5%	54.1%	
Maximum Green (s)	7.0	23.5	23.5	7.0	23.5	23.5	18.0	18.0	18.0	19.5	40.5	
Yellow Time (s)	2.9	3.5	3.5	2.9	3.5	3.5	3.5	3.5	3.5	2.9	3.5	
All-Red Time (s)	0.1	2.0	2.0	0.1	2.0	2.0	2.0	2.0	2.0	0.1	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	
Total Lost Time (s)	3.0	5.5	5.5	3.0	5.5	5.5		5.5	5.5	3.0	5.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None	
recall Mode					IVIIII							

### Lanes, Volumes, Timings

### 1: W Chestermere Dr/Windermere Blvd & Hwy 1A

2023 Background PM Peak

	۶	-	*	1	•	•	1	Ť	1	1	Ţ	4
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Flash Dont Walk (s)		11.0	11.0		11.0	11.0	11.0	11.0	11.0	11.0	11.0	
Pedestrian Calls (#/hr)		0	0		0	0	0	0	0	0	0	
Act Effct Green (s)	32.9	23.4	23.4	33.6	25.6	25.6		12.0	12.0	35.8	33.3	
Actuated g/C Ratio	0.42	0.30	0.30	0.43	0.33	0.33		0.15	0.15	0.46	0.43	
v/c Ratio	0.27	0.90	0.06	0.62	0.45	0.50		0.50	0.28	0.62	0.30	
Control Delay	14.8	48.6	0.2	26.1	25.5	5.2		38.2	7.4	19.4	12.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	
Total Delay	14.8	48.6	0.2	26.1	25.5	5.2		38.2	7.4	19.4	12.9	
LOS	В	D	Α	С	С	Α		D	Α	В	В	
Approach Delay		39.5			16.1			24.8			17.0	
Approach LOS		D			В			С			В	
Queue Length 50th (m)	10.6	69.2	0.0	13.8	32.3	0.0		17.0	0.0	38.9	17.5	
Queue Length 95th (m)	22.6	#134.3	0.0	#33.2	58.2	19.1		32.6	9.4	60.9	31.7	
Internal Link Dist (m)		198.2			130.7			217.2			109.7	
Turn Bay Length (m)	110.0		110.0	70.0		85.0			60.0			
Base Capacity (vph)	486	556	548	264	603	770		367	445	646	930	
Starvation Cap Reductn	0	0	0	0	0	0		0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0		0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0		0	0	0	0	
Reduced v/c Ratio	0.27	0.89	0.06	0.63	0.45	0.50		0.33	0.21	0.61	0.25	

### Intersection Summary

Area Type: Cycle Length: 85 Other

Cycle Length: 85
Actuated Cycle Length: 77.7
Natural Cycle: 85
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.90
Intersection Signal Delay: 23.8
Intersection Capacity Utilization 75.7%
Acquisic Proceed (min.) 4

Intersection LOS: C ICU Level of Service D

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 1: W Chestermere Dr/Windermere Blvd & Hwy 1A



Clearwater Park Synchro 9 Report ISL

Lanes, Volumes, Timings

2: E Chestermere Dr/Cove Dr & Hwy 1A

2023 Background PM Peak

	•	-	*	1	<b>←</b>	*	1	<b>†</b>	1	-	<b>↓</b>	1
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	7	<b>^</b>	7	*	<b>^</b>	7	*	1>			ર્ન	7
Traffic Volume (vph)	115	611	224	99	487	64	196	19	88	46	12	79
Future Volume (vph)	115	611	224	99	487	64	196	19	88	46	12	79
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Storage Length (m)	60.0		50.0	75.0		20.0	60.0		0.0	0.0		40.0
Storage Lanes	1		1	1		1	1		0	0		1
Taper Length (m)	25.0			25.0			25.0			25.0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.877				0.850
Flt Protected	0.950			0.950			0.950				0.962	
Satd. Flow (prot)	1742	3484	1559	1742	3484	1559	1742	1608	0	0	1764	1559
Flt Permitted	0.463			0.406			0.717				0.730	
Satd. Flow (perm)	849	3484	1559	745	3484	1559	1315	1608	0	0	1339	1559
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			236			67		93				83
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		205.4			143.4			261.8			215.5	
Travel Time (s)		14.8			10.3			18.8			15.5	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	121	643	236	104	513	67	206	20	93	48	13	83
Shared Lane Traffic (%)												
Lane Group Flow (vph)	121	643	236	104	513	67	206	113	0	0	61	83
Enter Blocked Intersection	No	No	No									
Lane Alignment	Left	Left	Right									
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
Turning Speed (k/h)	30		25	30		25	30		25	30		25
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6		6	8			4		4
Detector Phase	2	2	2	6	6	6	8	8		4	4	4
Switch Phase												
Minimum Initial (s)	20.0	20.0	20.0	20.0	20.0	20.0	10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	25.5	25.5	25.5	25.5	25.5	25.5	23.5	23.5		23.5	23.5	23.5
Total Split (s)	32.0	32.0	32.0	32.0	32.0	32.0	28.0	28.0		28.0	28.0	28.0
Total Split (%)	53.3%	53.3%	53.3%	53.3%	53.3%	53.3%	46.7%	46.7%		46.7%	46.7%	46.7%
Maximum Green (s)	26.5	26.5	26.5	26.5	26.5	26.5	22.5	22.5		22.5	22.5	22.5
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5			5.5	5.5
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	Min	Min	Min	Min	Min	Min	None	None		None	None	None
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0		7.0	7.0	7.0

## Lanes, Volumes, Timings

2: E Chestermere Dr/Cove Dr & Hwy 1A

2023 Background PM Peak

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0		11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0		0	0	0
Act Effct Green (s)	23.3	23.3	23.3	23.3	23.3	23.3	13.2	13.2			13.2	13.2
Actuated g/C Ratio	0.49	0.49	0.49	0.49	0.49	0.49	0.28	0.28			0.28	0.28
v/c Ratio	0.29	0.38	0.27	0.29	0.30	0.08	0.56	0.22			0.16	0.17
Control Delay	11.1	9.2	2.5	11.4	8.6	3.2	20.8	5.8			13.4	4.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0
Total Delay	11.1	9.2	2.5	11.4	8.6	3.2	20.8	5.8			13.4	4.6
LOS	В	Α	Α	В	Α	Α	С	Α			В	Α
Approach Delay		7.8			8.5			15.5			8.4	
Approach LOS		Α			Α			В			Α	
Queue Length 50th (m)	5.0	14.6	0.0	4.3	11.2	0.0	12.9	1.1			3.4	0.0
Queue Length 95th (m)	18.0	33.5	9.4	16.2	26.3	5.2	32.0	9.6			10.9	7.0
Internal Link Dist (m)		181.4			119.4			237.8			191.5	
Turn Bay Length (m)	60.0		50.0	75.0		20.0	60.0					40.0
Base Capacity (vph)	489	2008	998	429	2008	927	630	819			642	791
Starvation Cap Reductn	0	0	0	0	0	0	0	0			0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0			0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0			0	0
Reduced v/c Ratio	0.25	0.32	0.24	0.24	0.26	0.07	0.33	0.14			0.10	0.10
Intersection Summary												

# Intersection Summary Area Type: Other Cycle Length: 60 Actuated Cycle Length: 47.7 Natural Cycle: 50 Control Type: Actuated-Uncoordinated Maximum v/c Ratio: 0.56 Intersection Signal Delay: 9.2 Intersection Capacity Utilization 65.6% Analysis Period (min) 15

Intersection LOS: A ICU Level of Service C

Splits and Phases: 2: E Chestermere Dr/Cove Dr & Hwy 1A



HCM Unsignalized Intersection Capacity Analysis 3: Hwy 1 SB On Ramp/Hwy 1 SB Off Ramp & Hwy 1A

2023 Background PM Peak

	۶	-	*	1	•	*	1	†	-	-	<b>↓</b>	1
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		<b>^</b>	7	*	<b>^</b>					7		7
Traffic Volume (veh/h)	0	335	338	7	246	0	0	0	0	33	0	404
Future Volume (Veh/h)	0	335	338	7	246	0	0	0	0	33	0	404
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	353	356	7	259	0	0	0	0	35	0	425
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												7
Median type		None			None							
Median storage veh)												
Upstream signal (m)		143										
pX, platoon unblocked												
vC, conflicting volume	259			353			496	626	176	450	626	130
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	259			353			496	626	176	450	626	130
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			100	100	100	93	100	53
cM capacity (veh/h)	1303			1202			239	397	836	491	397	896
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1					
Volume Total	176	176	356	7	130	130	460					
Volume Left	0	0	0	7	0	0	35					
Volume Right	0	0	356	0	0	0	425					
cSH	1700	1700	1700	1202	1700	1700	970					
Volume to Capacity	0.10	0.10	0.21	0.01	0.08	0.08	0.47					
Queue Length 95th (m)	0.0	0.0	0.0	0.1	0.0	0.0	19.8					
Control Delay (s)	0.0	0.0	0.0	8.0	0.0	0.0	12.6					
Lane LOS				Α			В					
Approach Delay (s)	0.0			0.2			12.6					
Approach LOS							В					
Intersection Summary												
Average Delay			4.1									
Intersection Capacity Utiliza	tion		39.3%	IC	CU Level	of Service			Α			
Analysis Period (min)			15									

Clearwater Park Synchro 9 Report

	۶	<b>→</b>	•	*	-	4
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	*	<b>^</b>	<b>∱</b> Љ			
Traffic Volume (veh/h)	283	84	38	4	0	0
Future Volume (Veh/h)	283	84	38	4	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	298	88	40	4	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)		None	None			
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	40				682	22
vC1, stage 1 conf vol	40				002	22
vC1, stage 1 conf vol						
	40				coo	22
vCu, unblocked vol					682	
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	81				100	100
cM capacity (veh/h)	1568				311	1050
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	
Volume Total	298	44	44	27	17	
Volume Left	298	0	0	0	0	
Volume Right	0	0	0	0	4	
cSH	1568	1700	1700	1700	1700	
Volume to Capacity	0.19	0.03	0.03	0.02	0.01	
Queue Length 95th (m)	5.3	0.0	0.0	0.0	0.0	
Control Delay (s)	7.8	0.0	0.0	0.0	0.0	
Lane LOS	Α					
Approach Delay (s)	6.0			0.0		
Approach LOS						
Intersection Summary						
Average Delay			5.4			
Intersection Capacity Utiliz	ation		26.1%	IC	U Level o	f Service
Analysis Period (min)			15			. 55, 1,00
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Clearwater Park Synchro 9 Report

# HCM Unsignalized Intersection Capacity Analysis 11: Highway 791 & Highway 1

2023 Background PM Peak

	•	-	*	1	•	*	1	<b>†</b>	1	-	Ţ	1
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	*	<b>^</b>	7	7	<b>†</b> }			4			4	
Traffic Volume (veh/h)	4	1148	111	33	694	2	70	3	35	1	1	4
Future Volume (Veh/h)	4	1148	111	33	694	2	70	3	35	1	1	4
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	4	1208	117	35	731	2	74	3	37	1	1	4
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		Raised			Raised							
Median storage veh)		3			3							
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	733			1325			1656	2019	604	1452	2135	366
vC1, stage 1 conf vol							1216	1216		802	802	
vC2, stage 2 conf vol							440	803		650	1333	
vCu, unblocked vol	733			1325			1656	2019	604	1452	2135	366
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			93			61	99	92	100	99	99
cM capacity (veh/h)	868			517			188	227	441	267	177	630
Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	NB 1	SB 1			
Volume Total	4	604	604	117	35	487	246	114	6			
Volume Left	4	0	0	0	35	0	0	74	1			
Volume Right	0	0	0	117	0	0	2	37	4			
cSH	868	1700	1700	1700	517	1700	1700	232	382			
Volume to Capacity	0.00	0.36	0.36	0.07	0.07	0.29	0.14	0.49	0.02			
Queue Length 95th (m)	0.1	0.0	0.0	0.0	1.6	0.0	0.0	18.9	0.4			
Control Delay (s)	9.2	0.0	0.0	0.0	12.5	0.0	0.0	34.6	14.6			
Lane LOS	Α				В			D	В			
Approach Delay (s)	0.0				0.6			34.6	14.6			
Approach LOS								D	В			
Intersection Summary												
Average Delay			2.0									
Intersection Capacity Utiliza	ition		52.3%	IC	U Level o	of Service			Α			
Analysis Period (min)			15									

Lanes, Volumes, Timings

1: W Chestermere Dr/Windermere Blvd & Hwy 1A

2023 Background + Development AM Peak

	٠	<b>→</b>	*	•	•	•	1	<b>†</b>	/	-	ļ	1
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	7	<b>^</b>	7	7	<b>†</b>	7		ર્ન	7	7	1	
Traffic Volume (vph)	130	380	23	79	484	381	48	162	144	486	102	204
Future Volume (vph)	130	380	23	79	484	381	48	162	144	486	102	204
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Storage Length (m)	110.0		110.0	70.0		85.0	50.0		40.0	0.0		0.0
Storage Lanes	1		1	1		1	0		1	1		0
Taper Length (m)	25.0			25.0			25.0			25.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850		0.900	
FIt Protected	0.950			0.950				0.989		0.950		
Satd. Flow (prot)	1742	1834	1559	1742	1834	1559	0	1814	1559	1742	1650	0
FIt Permitted	0.154			0.331				0.831		0.334		
Satd. Flow (perm)	282	1834	1559	607	1834	1559	0	1524	1559	613	1650	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			77			405			153		113	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		222.2			154.7			241.2			133.7	
Travel Time (s)		16.0			11.1			17.4			9.6	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	138	404	24	84	515	405	51	172	153	517	109	217
Shared Lane Traffic (%)	,,,,			•	0.0	100	•			0.11	100	
Lane Group Flow (vph)	138	404	24	84	515	405	0	223	153	517	326	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	Lon	3.7	rugiit	Lon	3.7	rugiit	Lon	3.7	rugiit	Loit	3.7	rugiit
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane		1.0			1.0			1.0			1.0	
Headway Factor	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
Turning Speed (k/h)	30	1.02	25	30	1.02	25	30	1.02	25	30	1.02	25
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	20
Protected Phases	5	2	1 01111	1	6	1 01111	1 01111	8	1 01111	7	4	
Permitted Phases	2	_	2	6	U	6	8	U	8	4	-	
Detector Phase	5	2	2	1	6	6	8	8	8	7	4	
Switch Phase	J				U	U	U	U	U	,	-	
Minimum Initial (s)	7.0	20.0	20.0	7.0	20.0	20.0	10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	10.0	25.5	25.5	10.0	25.5	25.5	23.5	23.5	23.5	22.5	23.5	
Total Split (s)	10.0	48.0	48.0	10.0	48.0	48.0	28.0	28.0	28.0	34.0	62.0	
Total Split (%)	8.3%	40.0%	40.0%	8.3%	40.0%	40.0%	23.3%	23.3%	23.3%	28.3%	51.7%	
Maximum Green (s)	7.0	42.5	42.5	7.0	42.5	42.5	22.5	22.5	22.5	31.0	56.5	
Yellow Time (s)	2.9	3.5	3.5	2.9	3.5	3.5	3.5	3.5	3.5	2.9	3.5	
	0.1	2.0	2.0	0.1	2.0	2.0	2.0	2.0	2.0	0.1	2.0	
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	
Lost Time Adjust (s)												
Total Lost Time (s)	3.0	5.5	5.5	3.0	5.5	5.5	1	5.5	5.5	3.0	5.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	2.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None	
Walk Time (s)		7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0	7.0	

Synchro 9 Report Clearwater Park ISL

Lanes, Volumes, Timings

2023 Background + Development AM Peak

	•	$\rightarrow$	*	1		-	1	T		-	¥	*
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Flash Dont Walk (s)		11.0	11.0		11.0	11.0	11.0	11.0	11.0	11.0	11.0	
Pedestrian Calls (#/hr)		0	0		0	0	0	0	0	0	0	
Act Effct Green (s)	46.0	38.2	38.2	45.2	35.5	35.5		19.4	19.4	55.0	52.4	
Actuated g/C Ratio	0.42	0.35	0.35	0.41	0.32	0.32		0.18	0.18	0.50	0.48	
v/c Ratio	0.64	0.63	0.04	0.26	0.87	0.52		0.83	0.38	0.84	0.38	
Control Delay	35.2	36.3	0.1	20.7	50.8	5.3		70.1	9.6	34.3	13.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	
Total Delay	35.2	36.3	0.1	20.7	50.8	5.3		70.1	9.6	34.3	13.7	
LOS	D	D	Α	С	D	Α		Е	Α	С	В	
Approach Delay		34.5			29.9			45.5			26.4	
Approach LOS		С			С			D			С	
Queue Length 50th (m)	18.7	78.2	0.0	11.0	108.1	0.0		49.8	0.0	83.6	29.8	
Queue Length 95th (m)	#34.7	111.6	0.0	20.4	151.0	20.1		#87.8	17.4	#137.5	52.2	
Internal Link Dist (m)		198.2			130.7			217.2			109.7	
Turn Bay Length (m)	110.0		110.0	70.0		85.0			40.0			
Base Capacity (vph)	214	727	665	325	727	862		320	448	635	923	
Starvation Cap Reductn	0	0	0	0	0	0		0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0		0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0		0	0	0	0	
Reduced v/c Ratio	0.64	0.56	0.04	0.26	0.71	0.47		0.70	0.34	0.81	0.35	
Intersection Cummens												

Area Type:

Cycle Length: 120 Actuated Cycle Length: 109.4

Natural Cycle: 85

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.87
Intersection Signal Delay: 31.9
Intersection Capacity Utilization 89.8%

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 1: W Chestermere Dr/Windermere Blvd & Hwy 1A



Intersection LOS: C ICU Level of Service E

Lanes, Volumes, Timings
2: E Chestermere Dr/Cove Dr & Hwy 1A

2023 Background + Development AM Peak

	۶	<b>→</b>	•	•	<b>←</b>	•	1	†	~	-	<b>↓</b>	1
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	*	<b>^</b>	7	*	44	7	*	<b>1</b> >			ર્લ	7
Traffic Volume (vph)	20	1025	75	52	530	17	203	4	108	108	11	103
Future Volume (vph)	20	1025	75	52	530	17	203	4	108	108	11	103
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Storage Length (m)	60.0		50.0	75.0		20.0	60.0		0.0	0.0		40.0
Storage Lanes	1		1	1		1	1		0	0		1
Taper Length (m)	25.0			25.0			25.0			25.0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.855				0.850
FIt Protected	0.950			0.950			0.950				0.957	
Satd. Flow (prot)	1742	3484	1559	1742	3484	1559	1742	1568	0	0	1755	1559
FIt Permitted	0.440			0.200			0.676				0.665	
Satd. Flow (perm)	807	3484	1559	367	3484	1559	1240	1568	0	0	1220	1559
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			80			27		55				110
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		205.4			143.4			261.8			215.5	
Travel Time (s)		14.8			10.3			18.8			15.5	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	21	1090	80	55	564	18	216	4	115	115	12	110
Shared Lane Traffic (%)												
Lane Group Flow (vph)	21	1090	80	55	564	18	216	119	0	0	127	110
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7	•		3.7			3.7	Ū		3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
Turning Speed (k/h)	30		25	30		25	30		25	30		25
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6		6	8			4		4
Detector Phase	2	2	2	6	6	6	8	8		4	4	4
Switch Phase												
Minimum Initial (s)	20.0	20.0	20.0	20.0	20.0	20.0	10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	25.5	25.5	25.5	25.5	25.5	25.5	22.5	22.5		22.5	22.5	22.5
Total Split (s)	34.8	34.8	34.8	34.8	34.8	34.8	25.2	25.2		25.2	25.2	25.2
Total Split (%)	58.0%	58.0%	58.0%	58.0%	58.0%	58.0%	42.0%	42.0%		42.0%	42.0%	42.0%
Maximum Green (s)	29.3	29.3	29.3	29.3	29.3	29.3	20.7	20.7		20.7	20.7	20.7
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		110	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	4.5	4.5			4.5	4.5
Lead/Lag	0.0	0.0	0.0	0.0	0.0	0.0	0				0	0
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	Min	Min	Min	Min	Min	Min	None	None		None	None	None
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0		7.0	7.0	7.0

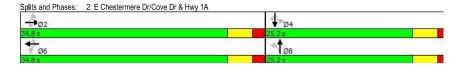
Clearwater Park Synchro 9 Report

Lanes, Volumes, Timings
2: E Chestermere Dr/Cove Dr & Hwy 1A

2023 Background + Development AM Peak

	•	-	*	1	•	•	1	<b>†</b>	1	1	<b>↓</b>	1
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0		11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0		0	0	0
Act Effct Green (s)	24.5	24.5	24.5	24.5	24.5	24.5	14.2	14.2			14.2	14.2
Actuated g/C Ratio	0.50	0.50	0.50	0.50	0.50	0.50	0.29	0.29			0.29	0.29
v/c Ratio	0.05	0.63	0.10	0.30	0.32	0.02	0.60	0.24			0.36	0.21
Control Delay	7.9	11.3	2.7	13.8	8.4	2.9	23.5	9.9			17.8	4.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0
Total Delay	7.9	11.3	2.7	13.8	8.4	2.9	23.5	9.9			17.8	4.7
LOS	Α	В	Α	В	Α	Α	С	Α			В	Α
Approach Delay		10.7			8.7			18.7			11.7	
Approach LOS		В			Α			В			В	
Queue Length 50th (m)	0.8	31.2	0.0	2.4	13.2	0.0	15.4	3.9			8.3	0.0
Queue Length 95th (m)	4.1	61.2	5.3	11.0	27.6	2.0	36.1	14.0			21.5	8.3
Internal Link Dist (m)		181.4			119.4			237.8			191.5	
Turn Bay Length (m)	60.0		50.0	75.0		20.0	60.0					40.0
Base Capacity (vph)	497	2146	991	226	2146	971	539	713			531	740
Starvation Cap Reductn	0	0	0	0	0	0	0	0			0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0			0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0			0	0
Reduced v/c Ratio	0.04	0.51	0.08	0.24	0.26	0.02	0.40	0.17			0.24	0.15
Intersection Summary												
Area Type:	Other											
Cycle Length: 60												

Intersection LOS: B	
ICU Level of Service C	



Lanes, Volumes, Timings 3: Hwy 1 SB On Ramp/Hwy 1 SB Off Ramp & Hwy 1A

2023 Background + Development AM Peak

	٠	<b>→</b>	*	•	<b>←</b>	•	4	<b>†</b>	~	/	Ţ	4
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		<b>^</b>	7	*	44					1/1		7
Traffic Volume (vph)	0	795	133	161	316	0	0	0	0	170	0	95
Future Volume (vph)	0	795	133	161	316	0	0	0	0	170	0	95
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Storage Length (m)	0.0		60.0	40.0		0.0	0.0		0.0	0.0		50.0
Storage Lanes	0		1	1		0	0		0	2		1
Taper Length (m)	25.0			25.0			25.0			25.0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frt			0.850									0.850
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	3484	1559	1742	3484	0	0	0	0	3380	0	1559
Flt Permitted				0.256						0.950		
Satd, Flow (perm)	0	3484	1559	469	3484	0	0	0	0	3380	0	1559
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			141									101
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		143.4			217.4			322.0			267.3	
Travel Time (s)		10.3			15.7			23.2			19.2	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adi, Flow (vph)	0	846	141	171	336	0	0	0	0	181	0	101
Shared Lane Traffic (%)	-					-	-	-	-		-	
Lane Group Flow (vph)	0	846	141	171	336	0	0	0	0	181	0	101
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7	3		7.4	3		7.4	3
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
Turning Speed (k/h)	30		25	30		25	30		25	30		25
Turn Type		NA	Perm	pm+pt	NA					Prot		Perm
Protected Phases		2		1	6					7		
Permitted Phases			2	6								4
Detector Phase		2	2	1	6					7		4
Switch Phase												
Minimum Initial (s)		20.0	20.0	7.0	20.0					10.0		10.0
Minimum Split (s)		25.5	25.5	11.5	25.5					14.5		22.5
Total Split (s)		26.0	26.0	11.5	37.5					22.5		22.5
Total Split (%)		43.3%	43.3%	19.2%	62.5%					37.5%		37.5%
Maximum Green (s)		20.5	20.5	8.5	32.0					18.0		18.0
Yellow Time (s)		3.5	3.5	2.9	3.5					3.5		3.5
All-Red Time (s)		2.0	2.0	0.1	2.0					1.0		1.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0					0.0		0.0
Total Lost Time (s)		5.5	5.5	3.0	5.5					4.5		4.5
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?		Yes	Yes	Yes								
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0		3.0
Recall Mode		Min	Min	None	Min					None		None

Clearwater Park Synchro 9 Report

Lanes, Volumes, Timings 3: Hwy 1 SB On Ramp/Hwy 1 SB Off Ramp & Hwy 1A

2023 Background + Development AM Peak

	٠	-	•	1	•	•	1	1	1	-	ļ	1
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Flash Dont Walk (s)		11.0	11.0		11.0							11.0
Pedestrian Calls (#/hr)		0	0		0							0
Act Effct Green (s)		24.6	24.6	33.5	32.5					10.3		10.3
Actuated g/C Ratio		0.52	0.52	0.71	0.69					0.22		0.22
v/c Ratio		0.47	0.16	0.32	0.14					0.25		0.24
Control Delay		12.2	3.0	4.9	4.2					18.5		6.7
Queue Delay		0.0	0.0	0.0	0.0					0.0		0.0
Total Delay		12.2	3.0	4.9	4.2					18.5		6.7
LOS		В	Α	Α	Α					В		Α
Approach Delay		10.9			4.5						14.3	
Approach LOS		В			Α						В	
Queue Length 50th (m)		30.3	0.0	4.7	5.7					7.2		0.0
Queue Length 95th (m)		46.8	7.8	9.4	9.7					14.3		9.4
Internal Link Dist (m)		119.4			193.4			298.0			243.3	
Turn Bay Length (m)			60.0	40.0								50.0
Base Capacity (vph)		1816	880	567	2423					1322		671
Starvation Cap Reductn		0	0	0	0					0		0
Spillback Cap Reductn		0	0	0	0					0		0
Storage Cap Reductn		0	0	0	0					0		0
Reduced v/c Ratio		0.47	0.16	0.30	0.14					0.14		0.15
Intersection Summary												
Area Type:	Other											
Cycle Length: 60												
Actuated Cycle Length: 4	7.4											
Making Cools, CO												

Actuated Cycle Length: 47.4

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.47

Intersection Signal Delay: 9.6

Intersection Capacity Utilization 48.0%

Analysis Period (min) 15 Intersection LOS: A ICU Level of Service A

Splits and Phases: 3: Hwy 1 SB On Ramp/Hwy 1 SB Off Ramp & Hwy 1A **√**Ø1 Ø4

	•	-	•	*	1	1
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	*	44	<b>†</b> 1>			
Traffic Volume (veh/h)	651	315	336	265	0	0
Future Volume (Veh/h)	651	315	336	265	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	693	335	357	282	0	0
Pedestrians	-		•••			
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)		None	None			
Upstream signal (m)		336				
pX, platoon unblocked		330				
vC, conflicting volume	357				2052	320
vC1, stage 1 conf vol	301				2052	320
vC1, stage 1 conf vol						
	257				2052	200
vCu, unblocked vol	357					320
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	42				100	100
cM capacity (veh/h)	1198				20	676
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	
Volume Total	693	168	168	238	401	
Volume Left	693	0	0	0	0	
Volume Right	0	0	0	0	282	
cSH	1198	1700	1700	1700	1700	
Volume to Capacity	0.58	0.10	0.10	0.14	0.24	
Queue Length 95th (m)	29.5	0.0	0.0	0.0	0.0	
Control Delay (s)	12.0	0.0	0.0	0.0	0.0	
Lane LOS	В					
Approach Delay (s)	8.1			0.0		
Approach LOS						
Intersection Summary						
Average Delay			5.0			
Intersection Capacity Utiliz	ation		62.0%	IC	U Level o	f Service
Analysis Period (min)			15			. 5550
, and join of orion (min)			10			

Clearwater Park Synchro 9 Report

# HCM Unsignalized Intersection Capacity Analysis 11: Highway 791 & Highway 1

2023 Background + Development AM Peak

	•	-	•	1	←		4	<b>†</b>	-	-	Ţ	1
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBF
Lane Configurations	*	<b>^</b>	7	*	<b>†</b> \$	WB/K	1102	4	HUIN	ODL	4	001
Traffic Volume (veh/h)	1	784	59	51	1391	5	52	0	17	0	1	
Future Volume (Veh/h)	1	784	59	51	1391	5	52	0	17	0	1	_
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	1	834	63	54	1480	5	55	0	18	0	1	4
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		Raised			Raised							
Median storage veh)		3			3							
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1485			897			1688	2429	417	2028	2490	742
vC1, stage 1 conf vol							836	836		1590	1590	
vC2, stage 2 conf vol							852	1593		437	899	
vCu, unblocked vol	1485			897			1688	2429	417	2028	2490	742
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			93			77	100	97	100	99	99
cM capacity (veh/h)	449			753			243	148	585	103	146	358
Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	NB 1	SB 1			
Volume Total	1	417	417	63	54	987	498	73	5			
Volume Left	1	0	0	0	54	0	0	55	0			
Volume Right	0	0	0	63	0	0	5	18	4			
cSH	449	1700	1700	1700	753	1700	1700	284	277			
Volume to Capacity	0.00	0.25	0.25	0.04	0.07	0.58	0.29	0.26	0.02			
Queue Length 95th (m)	0.1	0.0	0.0	0.0	1.8	0.0	0.0	7.6	0.4			
Control Delay (s)	13.0	0.0	0.0	0.0	10.2	0.0	0.0	22.0	18.2			
Lane LOS	В				В			С	С			
Approach Delay (s)	0.0				0.4			22.0	18.2			
Approach LOS								С	С			
Intersection Summary												
Average Delay			0.9									
Intersection Capacity Utiliza	tion		60.9%	IC	:U Level o	of Service			В			
Analysis Period (min)			15									

Lanes, Volumes, Timings

1: W Chestermere Dr/Windermere Blvd & Hwy 1A

2023 Background + Development PM Peak

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	*	<b>↑</b>	7	*	<b>↑</b>	7	*	1		1	13	
Traffic Volume (vph)	123	608	31	157	367	365	27	89	89	375	147	71
Future Volume (vph)	123	608	31	157	367	365	27	89	89	375	147	71
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Storage Length (m)	110.0		110.0	70.0		85.0	50.0		0.0	0.0		0.0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (m)	25.0			25.0			25.0			25.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.925			0.951	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1742	1834	1559	1742	1834	1559	1742	1696	0	1742	1744	0
FIt Permitted	0.386			0.123			0.615			0.376		
Satd. Flow (perm)	708	1834	1559	226	1834	1559	1128	1696	0	690	1744	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			84			384		39			25	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		222.2			154.7			241.2			133.7	
Travel Time (s)		16.0			11.1			17.4			9.6	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	129	640	33	165	386	384	28	94	94	395	155	75
Shared Lane Traffic (%)												
Lane Group Flow (vph)	129	640	33	165	386	384	28	188	0	395	230	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
Turning Speed (k/h)	30		25	30		25	30		25	30		25
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases	5	2		1	6			8		7	4	
Permitted Phases	2		2	6		6	8			4		
Detector Phase	5	2	2	1	6	6	8	8		7	4	
Switch Phase												
Minimum Initial (s)	7.0	20.0	20.0	7.0	20.0	20.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	10.0	25.5	25.5	10.0	25.5	25.5	23.5	23.5		22.5	23.5	
Total Split (s)	10.0	53.0	53.0	10.0	53.0	53.0	23.5	23.5		23.5	47.0	
Total Split (%)	9.1%	48.2%	48.2%	9.1%	48.2%	48.2%	21.4%	21.4%		21.4%	42.7%	
Maximum Green (s)	7.0	47.5	47.5	7.0	47.5	47.5	18.0	18.0		20.5	41.5	
Yellow Time (s)	2.9	3.5	3.5	2.9	3.5	3.5	3.5	3.5		2.9	3.5	
All-Red Time (s)	0.1	2.0	2.0	0.1	2.0	2.0	2.0	2.0		0.1	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	3.0	5.5	5.5	3.0	5.5	5.5	5.5	5.5		3.0	5.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lag		Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	Min	Min	None	Min	Min	None	None		None	None	
Walk Time (s)		7.0	7.0		7.0	7.0	7.0	7.0		7.0	7.0	

Clearwater Park Synchro 9 Report ISL

Lanes, Volumes, Timings

2023 Background + Development PM Peak

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Flash Dont Walk (s)		11.0	11.0		11.0	11.0	11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)		0	0		0	0	0	0		0	0	
Act Effct Green (s)	47.6	37.9	37.9	47.6	37.9	37.9	14.1	14.1		39.8	37.3	
Actuated g/C Ratio	0.49	0.39	0.39	0.49	0.39	0.39	0.15	0.15		0.41	0.39	
v/c Ratio	0.30	0.89	0.05	0.74	0.54	0.45	0.17	0.67		0.79	0.33	
Control Delay	14.0	43.4	0.1	34.9	25.6	3.9	41.9	45.0		36.4	21.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	14.0	43.4	0.1	34.9	25.6	3.9	41.9	45.0		36.4	21.6	
LOS	В	D	Α	С	С	Α	D	D		D	С	
Approach Delay		36.9			18.3			44.6			31.0	
Approach LOS		D			В			D			С	
Queue Length 50th (m)	11.9	109.8	0.0	15.6	54.6	0.0	4.9	27.7		58.2	27.8	
Queue Length 95th (m)	22.4	165.5	0.0	#43.8	85.2	16.5	13.6	53.1		#95.0	50.5	
Internal Link Dist (m)		198.2			130.7			217.2			109.7	
Turn Bay Length (m)	110.0		110.0	70.0		85.0	50.0					
Base Capacity (vph)	425	922	825	223	922	974	215	354		512	780	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.30	0.69	0.04	0.74	0.42	0.39	0.13	0.53		0.77	0.29	

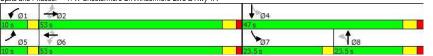
Intersection	Summar
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Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 96.6
Natural Cycle: 95
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.89
Intersection Signal Delay: 29.4
Intersection Capacity Utilization 89.4%
Applie Intersection LOS: C ICU Level of Service E

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 1: W Chestermere Dr/Windermere Blvd & Hwy 1A



Lanes, Volumes, Timings
2: E Chestermere Dr/Cove Dr & Hwy 1A

2023 Background + Development PM Peak

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		$\rightarrow$	*	1	200		1	Ť		-	+	*
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	*	<b>^</b>	7	1	<b>^</b>	7	*	1			4	7
Traffic Volume (vph)	115	750	224	99	598	64	196	19	88	46	12	79
Future Volume (vph)	115	750	224	99	598	64	196	19	88	46	12	79
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Storage Length (m)	60.0		50.0	75.0		20.0	60.0		0.0	0.0		40.0
Storage Lanes	1		1	1		1	1		0	0		1
Taper Length (m)	25.0			25.0			25.0			25.0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.877				0.850
FIt Protected	0.950			0.950			0.950				0.962	
Satd. Flow (prot)	1742	3484	1559	1742	3484	1559	1742	1608	0	0	1764	1559
FIt Permitted	0.413			0.339			0.717				0.702	
Satd. Flow (perm)	757	3484	1559	622	3484	1559	1315	1608	0	0	1287	1559
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			236			67		84				83
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		205.4			143.4			261.8			215.5	
Travel Time (s)		14.8			10.3			18.8			15.5	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adi. Flow (vph)	121	789	236	104	629	67	206	20	93	48	13	83
Shared Lane Traffic (%)	121	100	200	104	023	01	200	20	55	40	10	00
Lane Group Flow (vph)	121	789	236	104	629	67	206	113	0	0	61	83
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	Leit	3.7	rtigit	Leit	3.7	rtigrit	LGIL	3.7	ragiit	Leit	3.7	ragin
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane		1.0			1.0			1.0			1.0	
Headway Factor	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
Turning Speed (k/h)	30	1.02	25	30	1.02	25	30	1.02	25	30	1.02	25
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	20	Perm	NA	Perm
Protected Phases	reiiii	2	reiiii	reiiii	6	Feiiii	reiiii	8		reiiii	4	reiiii
Permitted Phases	2	2	2	6	Ü	6	8	0		4	4	4
Detector Phase	2	2	2	6	6	6	8	8		4	4	4
Switch Phase	2	2	2	0	b	0	0	0		4	4	4
Minimum Initial (s)	20.0	20.0	20.0	20.0	20.0	20.0	10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	25.5	25.5	25.5	25.5	25.5	25.5	23.5	23.5		23.5	23.5	23.5
	26.0		26.0			26.0		24.0		24.0		24.0
Total Split (s)	52.0%	26.0 52.0%	52.0%	26.0 52.0%	26.0 52.0%	52.0%	24.0 48.0%	48.0%		48.0%	24.0 48.0%	48.0%
Total Split (%)			20.5							18.5		
Maximum Green (s)	20.5	20.5		20.5	20.5	20.5	18.5	18.5			18.5	18.5
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5			5.5	5.5
Lead/Lag												
Lead-Lag Optimize?	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	Min	Min	Min	Min	Min	Min	None	None		None	None	None
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0		7.0	7.0	7.0

Clearwater Park Synchro 9 Report

Lanes, Volumes, Timings
2: E Chestermere Dr/Cove Dr & Hwy 1A

	•	-	7	1	<b>—</b>	*	1	<b>†</b>	1	-	<b>↓</b>	1
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0		11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0		0	0	0
Act Effct Green (s)	24.8	24.8	24.8	24.8	24.8	24.8	12.7	12.7			12.7	12.7
Actuated g/C Ratio	0.56	0.56	0.56	0.56	0.56	0.56	0.29	0.29			0.29	0.29
v/c Ratio	0.28	0.40	0.24	0.30	0.32	0.07	0.54	0.22			0.16	0.16
Control Delay	11.5	9.1	2.5	12.3	8.5	3.2	18.9	5.9			12.4	4.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0
Total Delay	11.5	9.1	2.5	12.3	8.5	3.2	18.9	5.9			12.4	4.2
LOS	В	Α	Α	В	Α	Α	В	Α			В	Α
Approach Delay		8.0			8.5			14.3			7.7	
Approach LOS		Α			Α			В			Α	
Queue Length 50th (m)	5.1	19.0	0.0	4.4	14.3	0.0	12.9	1.6			3.4	0.0
Queue Length 95th (m)	18.3	40.0	9.4	17.0	30.7	5.1	27.2	9.0			9.4	6.1
Internal Link Dist (m)		181.4			119.4			237.8			191.5	
Turn Bay Length (m)	60.0		50.0	75.0		20.0	60.0					40.0
Base Capacity (vph)	429	1977	986	353	1977	913	556	728			544	707
Starvation Cap Reductn	0	0	0	0	0	0	0	0			0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0			0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0			0	0
Reduced v/c Ratio	0.28	0.40	0.24	0.29	0.32	0.07	0.37	0.16			0.11	0.12
Intersection Summary												
Area Type:	Other											
Cycle Length: 50												
Actuated Cycle Length: 4-	4											

Natural Cycle: 50
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.54
Intersection Signal Delay: 9.0
Intersection Capacity Utilization 69.5% Intersection LOS: A ICU Level of Service C Analysis Period (min) 15



Lanes, Volumes, Timings 3: Hwy 1 SB On Ramp/Hwy 1 SB Off Ramp & Hwy 1A

2023 Background + Development PM Peak

´ <b>→</b>	*	1	•	*	1	1	-	1	Ţ	4
Lane Group EBL EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	7	7	<b>^</b>					44		7
Traffic Volume (vph) 0 474	338	205	357	0	0	0	0	334	0	404
Future Volume (vph) 0 474	338	205	357	0	0	0	0	334	0	404
Ideal Flow (vphpl) 1850 1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Storage Length (m) 0.0	60.0	40.0		0.0	0.0		0.0	0.0		50.0
Storage Lanes 0	1	1		0	0		0	2		1
Taper Length (m) 25.0		25.0			25.0			25.0		
Lane Util. Factor 1.00 0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frt	0.850									0.850
Flt Protected		0.950						0.950		
Satd. Flow (prot) 0 3484	1559	1742	3484	0	0	0	0	3380	0	1559
Flt Permitted		0.406						0.950		
Satd. Flow (perm) 0 3484	1559	745	3484	0	0	0	0	3380	0	1559
Right Turn on Red	Yes			Yes			Yes			Yes
Satd. Flow (RTOR)	356									425
Link Speed (k/h) 50			50			50			50	
Link Distance (m) 143.4			217.4			322.0			267.3	
Travel Time (s) 10.3			15.7			23.2			19.2	
Peak Hour Factor 0.95 0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph) 0 499	356	216	376	0	0	0	0	352	0	425
Shared Lane Traffic (%)										
Lane Group Flow (vph) 0 499	356	216	376	0	0	0	0	352	0	425
Enter Blocked Intersection No No	No	No	No	No	No	No	No	No	No	No
Lane Alignment Left Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m) 3.7	•		3.7	•		7.4			7.4	
Link Offset(m) 0.0			0.0			0.0			0.0	
Crosswalk Width(m) 1.6			1.6			1.6			1.6	
Two way Left Turn Lane										
Headway Factor 1.02 1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
Turning Speed (k/h) 30	25	30		25	30		25	30		25
Turn Type NA	Perm	pm+pt	NA					Prot		Perm
Protected Phases 2		1	6					7		
Permitted Phases	2	6								4
Detector Phase 2	2	1	6					7		4
Switch Phase										
Minimum Initial (s) 20.0	20.0	5.0	20.0					10.0		10.0
Minimum Split (s) 25.5	25.5	10.5	25.5					15.5		23.5
Total Split (s) 26.0	26.0	10.5	36.5					23.5		23.5
Total Split (%) 43.3%	43.3%	17.5%	60.8%					39.2%		39.2%
Maximum Green (s) 20.5	20.5	7.5	31.0					18.0		18.0
Yellow Time (s) 3.5	3.5	2.9	3.5					3.5		3.5
All-Red Time (s) 2.0	2.0	0.1	2.0					2.0		2.0
Lost Time Adjust (s) 0.0	0.0	0.0	0.0					0.0		0.0
Total Lost Time (s) 5.5	5.5	3.0	5.5					5.5		5.5
Lead/Lag Lag	Lag	Lead								
Lead-Lag Optimize? Yes	Yes	Yes								
Vehicle Extension (s) 3.0	3.0	3.0	3.0					3.0		3.0
Recall Mode Min	Min	None	Min					None		None
Walk Time (s) 7.0	7.0		7.0							7.0

Clearwater Park Synchro 9 Report ISL

Lanes, Volumes, Timings

2023 Background + Development PM Peak

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBF
Flash Dont Walk (s)		11.0	11.0		11.0							11.0
Pedestrian Calls (#/hr)		0	0		0							C
Act Effct Green (s)		20.1	20.1	32.8	30.3					11.5		11.5
Actuated g/C Ratio		0.38	0.38	0.62	0.57					0.22		0.22
v/c Ratio		0.38	0.44	0.36	0.19					0.48		0.63
Control Delay		13.3	3.7	6.5	6.0					20.5		7.1
Queue Delay		0.0	0.0	0.0	0.0					0.0		0.0
Total Delay		13.3	3.7	6.5	6.0					20.5		7.1
LOS		В	Α	Α	Α					С		F
Approach Delay		9.3			6.2						13.2	
Approach LOS		Α			Α						В	
Queue Length 50th (m)		16.8	0.0	6.9	7.3					15.2		0.0
Queue Length 95th (m)		30.6	13.8	17.5	15.3					25.0		17.5
Internal Link Dist (m)		119.4			193.4			298.0			243.3	
Turn Bay Length (m)			60.0	40.0								50.0
Base Capacity (vph)		1354	823	605	2048					1153		811
Starvation Cap Reductn		0	0	0	0					0		C
Spillback Cap Reductn		0	0	0	0					0		C
Storage Cap Reductn		0	0	0	0					0		(
Reduced v/c Ratio		0.37	0.43	0.36	0.18					0.31		0.52
Intersection Summary												
Area Type:	Other											
Cycle Length: 60												
Actuated Cycle Length: 52.8	3											
Natural Cycle: 60												

Intersection Sumn	narv	
Area Type:	Other	
Cycle Length: 60	o a loi	
Actuated Cycle Le	ngth: 52.8	
Natural Cycle: 60	Ĭ.	
Control Type: Actu	ated-Uncoordinated	
Maximum v/c Rati	o: 0.63	
Intersection Signa	I Delay: 9.8	Intersection LOS: A
Intersection Capac	city Utilization 51.5%	ICU Level of Service A
Analysis Period (n	nin) 15	



	•	<b>→</b>	•	*	1	4
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	*	44	<b>†</b> 1>			
Traffic Volume (veh/h)	283	524	347	246	0	0
Future Volume (Veh/h)	283	524	347	246	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	298	552	365	259	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		336				
pX, platoon unblocked		000				
vC, conflicting volume	365				1366	312
vC1, stage 1 conf vol	000				1000	012
vC2, stage 2 conf vol						
vCu, unblocked vol	365				1366	312
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)	741				0.0	0.0
tF (s)	2.2				3.5	3.3
p0 queue free %	75				100	100
cM capacity (veh/h)	1190				100	684
						004
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	
Volume Total	298	276	276	243	381	
Volume Left	298	0	0	0	0	
Volume Right	0	0	0	0	259	
cSH	1190	1700	1700	1700	1700	
Volume to Capacity	0.25	0.16	0.16	0.14	0.22	
Queue Length 95th (m)	7.5	0.0	0.0	0.0	0.0	
Control Delay (s)	9.0	0.0	0.0	0.0	0.0	
Lane LOS	Α					
Approach Delay (s)	3.2			0.0		
Approach LOS						
Intersection Summary						
Average Delay			1.8			
Intersection Capacity Utiliz	ation		40.7%	IC	U Level o	of Service
Analysis Period (min)			15			
, 5.6 . 5.164 (1/1)			.5			

Clearwater Park Synchro 9 Report

## HCM Unsignalized Intersection Capacity Analysis

1	1	Highway	791	ጲ	Highway 1	

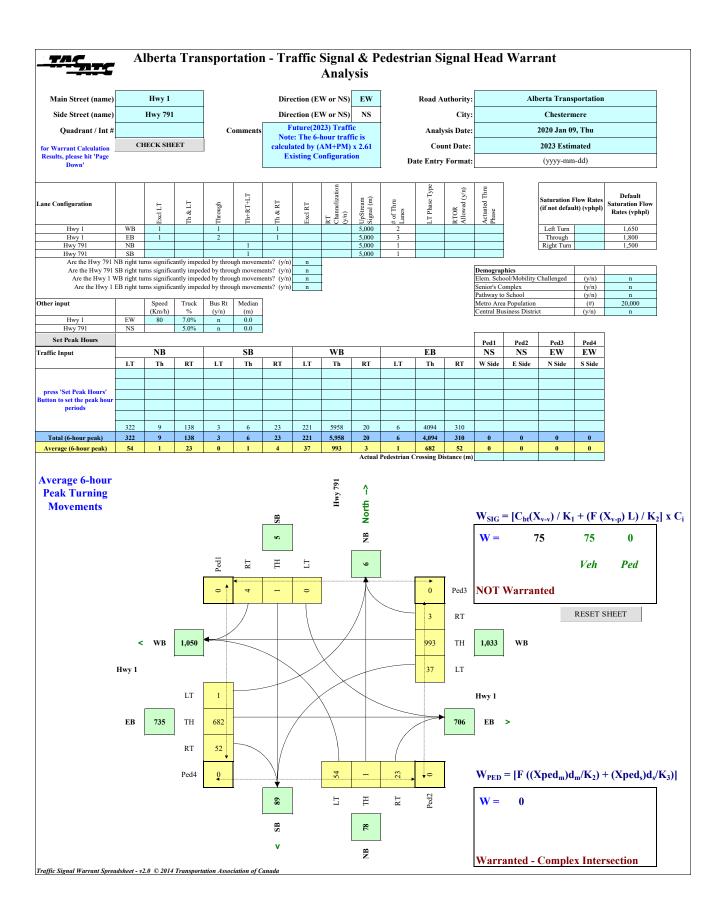
2023 Background + Development PM Peak

11: Highway 791 & F		у і		-			00000		longround	· Devoic	pment Pl	vi i car
	۶	$\rightarrow$	*	1	•	•	1	1	1	-	ţ	4
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBF
Lane Configurations	7	<b>^</b>	7	7	<b>↑</b> ↑			4			4	
Traffic Volume (veh/h)	4	1345	111	33	891	2	70	3	35	1	1	4
Future Volume (Veh/h)	4	1345	111	33	891	2	70	3	35	1	1	4
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	4	1416	117	35	938	2	74	3	37	1	1	4
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		Raised			Raised							
Median storage veh)		3			3							
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	940			1533			1968	2434	708	1764	2550	470
vC1, stage 1 conf vol							1424	1424		1009	1009	
vC2, stage 2 conf vol							544	1010		754	1541	
vCu, unblocked vol	940			1533			1968	2434	708	1764	2550	470
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			92			47	98	90	100	99	99
cM capacity (veh/h)	725			430			139	177	377	203	133	540
Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	NB 1	SB 1			
Volume Total	4	708	708	117	35	625	315	114	6			
Volume Left	4	0	0	0	35	0	0	74	1			
Volume Right	0	0	0	117	0	0	2	37	4			
cSH	725	1700	1700	1700	430	1700	1700	177	302			
Volume to Capacity	0.01	0.42	0.42	0.07	0.08	0.37	0.19	0.65	0.02			
Queue Length 95th (m)	0.1	0.0	0.0	0.0	2.0	0.0	0.0	28.2	0.5			
Control Delay (s)	10.0	0.0	0.0	0.0	14.1	0.0	0.0	56.5	17.2			
Lane LOS	Α				В			F	С			
Approach Delay (s)	0.0				0.5			56.5	17.2			
Approach LOS								F	С			
Intersection Summary												
Average Delay			2.7									
Intersection Capacity Utilizatio	n		57.9%	IC	CU Level o	of Service			В			
Analysis Period (min)			15									



**APPENDIX**Signal Warrant Analysis

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