





September 11, 2025

1000120857 Ontario Inc 110 MathesonBlvd W, Suite 120 Missisauga ON L5R 4G7

c/o Mr. Adam Dhalla The Biglieri Group

Re: <u>Proposed Residential Development, 20 Cairns Crescent, Huntsville, ON – Transportation Study</u>
- Response to Comments

Dear Mr. Chatwal,

TRANS-PLAN has prepared this updated Traffic Impact Study in support of the proposed residential development at 20 Cairns Crescent in the Town of Huntsville. The development consists of a 4-storey residential building with 184 units and one parking level providing 211 parking spaces. Vehicular access is proposed via a full-movement entrance on Cairns Crescent.

Trans-Plan previously prepared a Traffic Impact Study dated July 2024, which is provided in Appendix A. This is a Traffic Impact Study and Parking Study Update to reflect and address the comments according to the Peer Review comments dated May 2025. The comments are provided in Appendix B.

Our traffic impact study findings indicate that the development can be accommodated within the existing road network; however, localized capacity constraints are anticipated at the Highway 11 ramps and Cairns Drive/Main Street West by 2033–2038.

Our parking study supports the proposed parking supply despite a minimal shortfall relative to the Town's by-law, based on observed demand and comparisons with similar developments.

Additionally, the site plan review confirms that access and circulation meet or exceed applicable standards, with minor sightline improvements recommended to enhance safety.

Sincerely,

Anil Seegobin, P.Eng. Partner, Engineer

**Trans-Plan Transportation Inc.** Transportation Consultants



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#### 1. RESPONSE TO COMMENTS

This report includes revisions based on the peer review comments received on May 13, 2025. Below are the comments related to the Transportation Study dated July 2024, along with Trans-Plan's responses.

#### **Comment: Road Network**

There are errors in the description of the road network:

- Main Street West and Aspdin Road are also known as Muskoka Road 3, which is a Class C District Road (arterial) under the jurisdiction of the District Municipality of Muskoka.
- As per the Town's Official Plan, Kitchen Road South is an urban collector road.

This section should include a description of the study area intersections, including lane provision and control.

**Response:** This section of the report has been updated.

# **Comment: Traffic Counts**

The intersection of Kitchen Road South (urban collector) with Main Street West (arterial) should have been included in the study area.

**Response:** This intersection is included in the analysis of this updated report.

#### **Comment: Horizon Years**

As per MTO TIS guidelines and District of Muskoka TIS guidelines, a TIS should include the existing conditions, year of build-out, 5 years, and 10 years beyond build-out.

**Response:** The existing condition and the future horizon year of build-out, 5 years after build-out, and 10 years after build-out are included in the analysis of this report.

#### **Comment: Background Growth Rate**

No supporting background data has been provided to substantiate the 2% background growth rate (i.e., historical population and traffic growth, projected population and employment, etc.). While we do not necessarily disagree with the 2% growth rate applied, without supporting information, it can not be confirmed as conservative or appropriate.

**Response:** The application of a 2.0% annual background growth rate is justified in Section 6.2 of this report, which presents recent MTO traffic count data showing a 2.01% AADT growth rate (2013–2016) at a nearby representative location. The section also notes higher SADT volumes, supporting the rate as both reasonable and conservative.

#### **Comment: Background Developments**

The study notes that there are no planned developments in the surrounding area; however, as per the District's development applications map, there are developments in the area. There are commercial lands on Main Street West opposite Cairns Drive; and Huntsville Highlands to the south and east of the subject property. Huntsville Highlands abuts the unopened road allowance of Kitchen Road South and thus has the potential to significantly impact the volumes on the study area road network should its construction



include extending and connecting Kitchen Road South. The consultant should confirm which background developments in the area should be considered in the study.

**Response:** The developments identified—namely the Huntsville Highway Commercial located along Main Street West (Muskoka Road 3) and Huntsville Highlands Estates located south of Main Street West (Muskoka Road 3) between Highway 11 and Yonge Street South — have been considered in the analysis. Relevant background information and supporting studies for these developments were obtained through correspondence with the City staff and provided in Appendix C.

# **Comment: Planned Roadway & Transit Improvements**

The 2015 Road Needs Study has been superseded by a newer study. Please refer to the updated study and/or contact the Town regarding planned improvements to the road network. With respect to Main Street West/ Aspdin Road, contact the District for planned improvements (if any).

**Response:** Section 6.4 of this report has been updated to reference the Town of Huntsville Official Plan (adopted March 18, 2019) and confirm there are no planned roadway or transit improvements for Muskoka Road 3, Kitchen Road South, or other study roads. The Town was contacted for confirmation; however, no response was received.

## **Comment: Trip Distribution & Assignment**

The study should provide greater detail with respect to distribution and assignment (i.e. % of traffic heading N, S, E, W).

Provide detail as to how assignment to Site access points was derived. Given the size and orientation of the surface parking lot, it is expected that a majority of trips heading into Huntsville via Main Street West will use the Kitchen Road South access.

Given the site access locations and considering the shortest route, it would be expected that all traffic travelling to/from the north along Main Street West would do so Vla Kitchen Road South. As the site is expected to contribute volumes to the turning movements at the intersection of Kitchen Road South with Main Street West, it would be considered appropriate to include this intersection in the assessment.

There are trips assigned to Cairns Crescent/Crescent Road, which terminates as a dead end. All trips should be distributed to Main Street West to the south of Cairns Drive.

There are errors on Figure 6: Site Traffic Assignment. The access on Cairns Crescent illustrates 4 inbound left turns during the AM peak and 13 inbound left turns during the PM peak, but the volumes at Kitchen Road South indicated on 1 trip per peak hour approaching from that direction. Similarly, the there are 13 outbound right turns at the same access during the AM peak but only 11 trips turning left from Cairns Drive to Kitchen Road South.

**Response:** The trip distribution and assignment have been revised to include percentage-based directional splits (north, south, east, west), with clarification provided on how site access assignments were derived, considering the layout and orientation of the surface parking lot. The majority of the site traffic is now routed to/from Main Street West. The intersection of Kitchen Road South and Main Street West has been included in the analysis, and errors in the previous figure have been corrected. The updated report and figures reflect these revisions.



#### **Comment: Future Total Traffic Conditions**

It is standard practice for a TIS to Include an assessment of the year of build-out to establish whether any Improvements are required to support the development on completion. The assessment should include the year of build-out or a valid argument as to why the year of build-out was not considered. Include the v/c ratios in Table 3 for ease of reference.

**Response:** The comment is acknowledged. The report has been revised to include an assessment of the year of build-out, along with existing, 5-year, and 10-year post-build-out horizon scenarios to evaluate future total traffic conditions. Volume-to-capacity (v/c) ratios have also been added to Tables 4-6 (previously Table 3).

# **Comment: Parking Surveys at Proxy Site**

The vacancy at the proxy site should be confirmed (i.e. what is the parking rate per occupied unit). Parking justification should be supported by surveys completed at a minimum of 3 proxy sites.

**Response:** The parking analysis has been updated to include surveys from three proxy residential sites to determine parking demand.

#### **Comment: Site Circulation Review**

Swept path assessments for delivery vehicle and waste collection truck show vehicles using full width of driveway (i\_e\_ encroaching into oncoming traffic). Templates should be revisited to avoid encroachment into oncoming site traffic. Demonstrate that a loading vehicle can reverse into the loading area. The parking spaces at the end of the aisles in the parking garage are very tight, with the swept path encroaching on the structural pillars. For the exit movement the vehicle has been placed against the adjacent wall, which IS not feasible as the driver would not be able to enter or exit the vehicle. The illustration must demonstrate that use of the parking spaces are feasible. Reversing the vehicle into the space may yield better results.

**Response:** Comments on the updated vehicle maneuvering diagrams for loading, waste collection, and passenger vehicles have been reviewed and incorporated into the revised plans. It is noted that the fire emergency vehicle will encroach into the opposing traffic lane in certain areas of the site; however, this will be mitigated through the fire route signage measures described in Section 13.

## **Comment: General Comments**

The study should provide a review of the site access point in context of Town/industry standards or requirements Including:

- access location
- design (i e width, radii, etc)
- corner clearance
- clear throat length.

The sight lines must be assessed along Cairns Crescent and Kitchen Road South at the site access locations.

Minimum Stopping Sight Distance as per TAC must be considered for an appropriate design speed (posted + 10 km/h) With consideration for adjustments to account for grade.



Please provide comment on the condition of Kitchen Road South and Its ability to accommodate the additional site traffic - particularly south of Cairns Crescent to the site access. Identify any required improvements to support the development traffic.

**Response:** The site access has been reviewed in the context of applicable District of Muskoka and industry standards, including access location, width, corner radii, corner clearance, and clear throat length, as outlined in Section 11 (Site Access and Circulation Review). Sightline analysis is provided in Section 12, confirming compliance with TAC's Minimum Stopping Sight Distance requirements.

#### 2. INTRODUCTION

Trans-Plan has been retained by 1000120857 Ontario Inc. to complete a Transportation Study report for the proposed residential development, located at 20 Cairns Crescent in the Town of Huntsville, Ontario. This report includes the following study components and scope of work:

# **Traffic Impact Study**

- A review and assessment of the existing road network
- An assessment of boundary road operations under future background conditions, including a review
  of traffic growth, area developments, and proposed transportation improvements in the study area
- An assessment of the impact of site-generated traffic on the study area intersections under future conditions
- Recommendations to mitigate any identified traffic impacts at the boundary roadways and intersections, resulting from the proposed development

#### Parking Review

- Review of the site parking requirements for the proposed land use based on the Town of Huntsville
   Zoning By-law in comparison to the parking supply on-site
- Compare the Town's residential use by-law parking rates with other similar municipalities' parking rates
- Conducting parking utilization surveys of residential building developments (proxy sites) located in the surrounding study area
- An estimation of future parking demands, based on surveys of the proxy site, applying the surveyed rates

# Site Access and Circulation Review

- A review of the requirements for driveway width, throat length, and curb radii.
- Review of the site entrance for traffic operation, spacing, location, control, and configuration, and the City's design standards/access requirements, confirming the geometric functionality of the site access.
- A review of vehicle maneuver pathways for trucks (fire trucks, HSU/MSU, and waste collection vehicles) and for autos circulating the internal roadways and negotiating any roadway turns throughout the site using the AutoTurn vehicle turning template software.



#### Sightline Analysis

- A site visit and review of the field measurements for available sight distance at the proposed site
  access locations. Measurements were conducted both upstream and downstream of the site access
  locations.
- A review using the Transportation Association of Canada (TAC) manuals to check the recorded sight distance against design requirements to ensure the site access would operate well in its proposed location.

# <u>Traffic Signage and Pavement Marking Plan</u>

 Preparation of a Traffic Control and Signage Plan drawing illustrating traffic signage and pavement markings for the site (at a 1:300 scale, using Town and County standard templates and as per Ontario Traffic Manual guidelines), also illustrating any other traffic-related details on the site plan.

#### 3. SITE LOCATION

The subject site lies within the jurisdiction of the Ministry of Transportation Ontario's (MTO) Permit Control Area, situated to the east of Highway 11. More precisely, the development site is positioned just south of the intersection of Main Street West and Cairns Drive in the Town of Huntsville, within the Muskoka Region, see Figure 1.

Currently, the site is vacant with mainly vegetation. Surrounding land uses in the vicinity include residential properties to the east along Kitchen Road South, commercial establishments to the north and west, and a large expanse of undeveloped green space to the south. The Highway 11 interchange is located just north of the subject site, which generally travels in a north-south direction, connecting to locations such as North Bay and Barrie.

#### 4. PROPOSED DEVELOPMENT

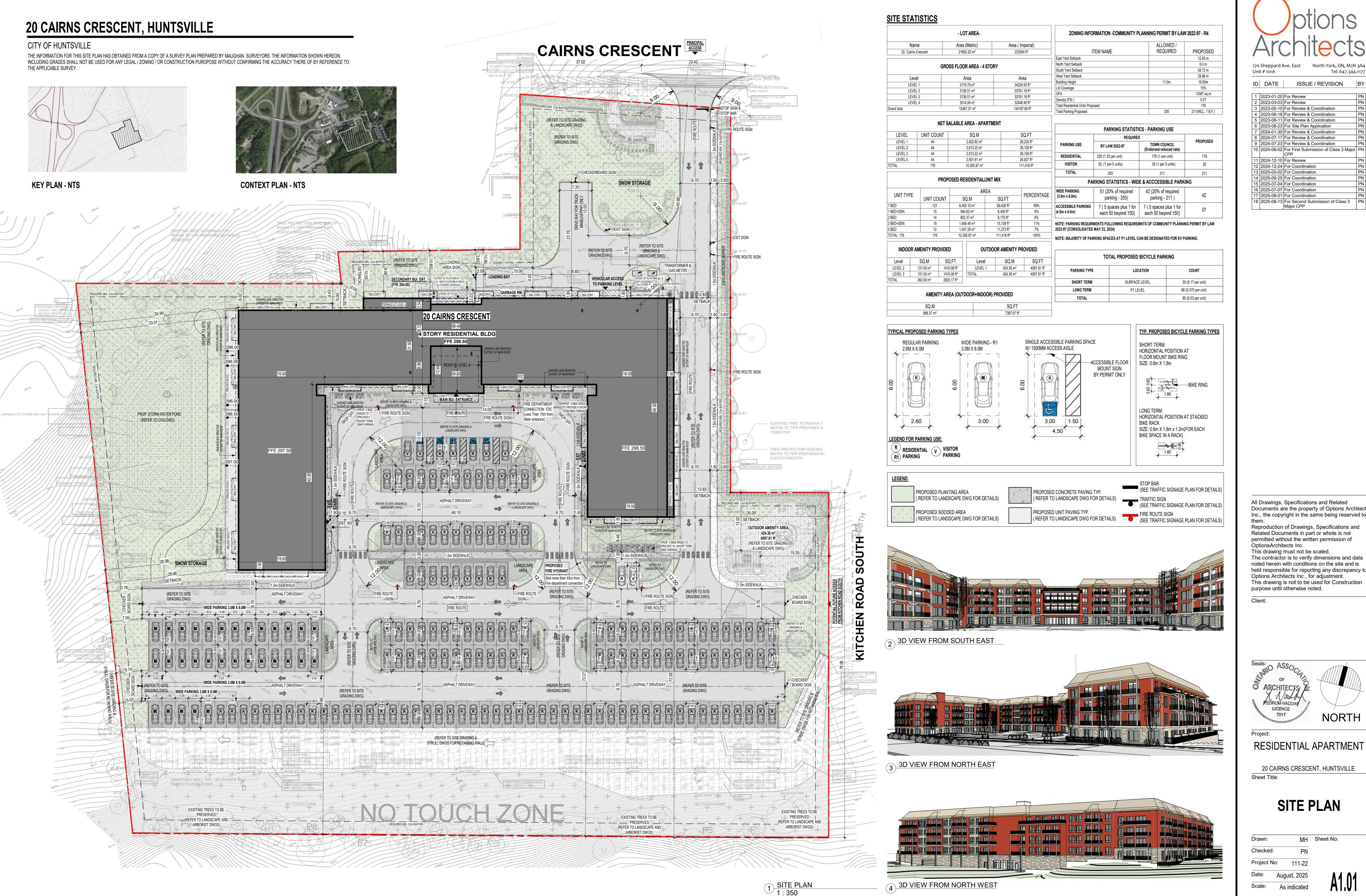
The site plan, prepared by Options Architects, is shown in Figure 2. The proposed development consists of a 4-storey residential building featuring 176 dwelling units, an indoor amenity with a GFA of 262 m<sup>2</sup>, and an outdoor amenity with a GFA of 479.38 m<sup>2</sup>. The total GFA of the 4-storey residential building is 12,467.37 m<sup>2</sup>. Surface and indoor garage parking levels will provide a total of 211 parking spaces, including accessible spaces (176 residential spaces and 35 visitor spaces). Vehicular access will be provided by one full-moves access on Cairns Crescent. A loading space is located on the north side of the building.







Source: Google Maps

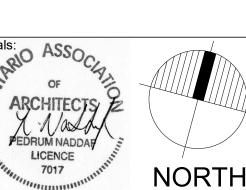


170 Sheppard Ave. East North York, ON, M2N 3A4 Tel: 647.344.1177 Unit # 101A ID DATE ISSUE / REVISION BY 1 2023-01-20 For Review 2023-03-03 For Review 2023-05-10 For Review & Coordination 2023-06-16 For Review & Coordination 2023-08-11 For Review & Coordination 2023-08-23 For Site Plan Application 2024-01-30 For Review & Coordination 2024-07-17 For Review & Coordination 2024-07-23 For Review & Coordination 10 2024-08-02 For First Submission of Class 3 Major F 2024-12-10 For Review

Major CPP

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RESIDENTIAL APARTMENT

20 CAIRNS CRESCENT, HUNTSVILLE

SITE PLAN

MH Sheet No: Checked:

Project No: 111-22

As indicated



#### 5. EXISTING CONDITIONS

#### 5.1 Road Network

The major roadways located in the study area are described as follows:

**Highway 11** is a north-south freeway under the jurisdiction of the MTO. Ramp connections are provided along Main Street West and Aspdin Road to enter and exit the highway. Off-ramp connections are stop-sign controlled, with advisory speed signs of 40km/h. On-ramp connections are channelized turns with advisory speed signs of 30km/h.

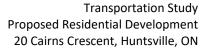
**Aspdin Road (Muskoka Road 3)** is classified as an arterial road under the jurisdiction of the District of Muskoka. The roadway runs in an east-west direction and is a continuation of Main Street West just west of the Highway 11 Northbound on/off ramp. It consists of two travel lanes, one in each direction. Aspdin Road has a posted speed limit of 60 km/h.

Main Street West (Muskoka Road 3) is classified as an arterial road under the jurisdiction of the District of Muskoka. The roadway runs in an east-west direction and connects to Highway 11. Main Street West has a posted speed limit of 60 km/h.

- Intersection of Main Street West and Cairns Drive: This is a four-leg intersection with varied lane configurations on each approach. The west leg, carrying eastbound traffic on Main Street West, has four lanes consisting of a dedicated left-turn lane, a dedicated right-turn lane, an eastbound through lane, and a single westbound lane. The east leg has three lanes, including a dedicated westbound left-turn lane, one westbound lane, and one eastbound lane. The south leg, which is Cairns Drive, also has three lanes: a dedicated left-turn lane for vehicles turning westbound, along with one lane for westbound traffic and one for eastbound traffic. The north leg features a simpler configuration, with one lane in each direction. The intersection is stop-controlled on the south leg at Cairns Drive.
- Intersection of Main Street West and Kitchen Road South: This T-intersection has distinct lane configurations on each approach. The west leg features a two-way left-turn lane in addition to one travel lane in each direction. The east leg includes a dedicated westbound left-turn lane, along with one lane for eastbound and westbound through traffic. The south leg, which is Kitchen Road South, has one lane in each direction. The intersection is stop-sign controlled on the south leg at Kitchen Road South.

**Cairns Crescent** is a local road under the jurisdiction of the Town of Huntsville. Cairns Crescent runs in an east-west direction, starting from Kitchen Road South and terminating in a cul-de-sac at the Muskoka Good Food Co-op. It consists of two travel lanes, one in each direction. It has an assumed speed limit of 50 km/h.

- Intersection of Cairns Drive and Cairns Crescent: This T-intersection is stop-controlled on the north leg of the intersection, at Cairns Drive. Both roads have one lane in each direction.
- Intersection of Cairns Crescent and Kitchen Road South: This T-intersection is stop-controlled on the west leg at Cairns Crescent. Both roads have one lane in each direction.





**Cairns Drive** is a local road under the jurisdiction of the Town of Huntsville. Cairns Drive runs in a north-south direction, starting from Cairns Crescent and terminating at the intersection of Main Street West. It consists of two travel lanes, one in each direction. It has an assumed speed limit of 50 km/h.

**Kitchen Road South** is an urban collector road under the jurisdiction of the Town of Huntsville. Kitchen Road South runs in a north-south direction, starting from Main Street West and terminating in a cul-desac in a residential neighbourhood. It consists of two travel lanes, one in each direction. It has an assumed speed limit of 50 km/h

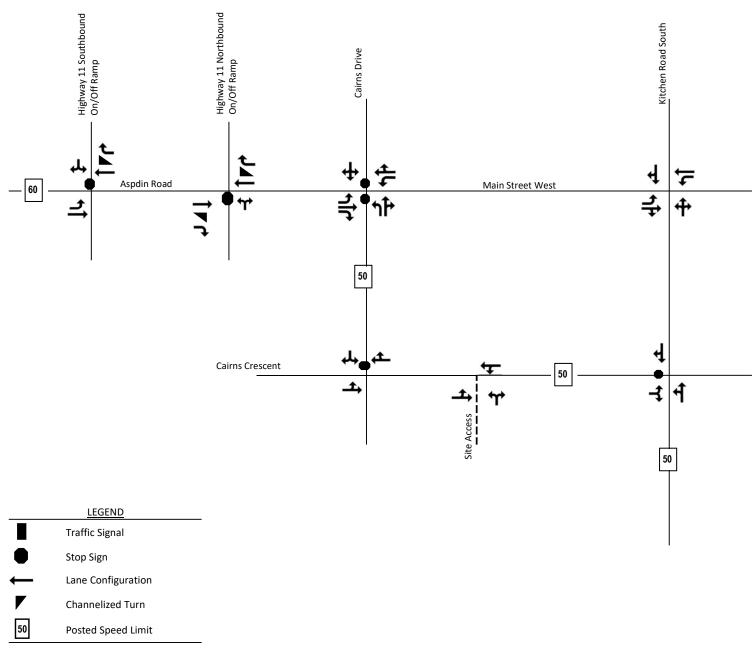
Figure 3 shows schematically the existing roadway characteristics within the study area.







# **Figure 3: Existing Study Area Roadway Characteristics**



Schematic; Not To Scale



#### 5.2 Pedestrian Connectivity

The subject property at 20 Cairns Crescent, located in Huntsville, Ontario, is situated within an established residential neighborhood. The surrounding area is primarily served by local roads, such as Cairns Crescent and Kitchen Road South, which provide access for both pedestrians and vehicles. Cairns Crescent, which fronts the property, is approximately 48 meters in length. However, it currently lacks dedicated pedestrian infrastructure, such as sidewalks, along most of its length. Pedestrians are required to walk alongside vehicles, which raises safety concerns, especially during periods of higher traffic.

Kitchen Road South, located to the east of the site, is another key route within the vicinity. Similar to Cairns Crescent, it is predominantly designed for vehicular traffic, with limited accommodations for pedestrians. However, the development includes an internal sidewalk connecting to Kitchen Road South on the eastern side of the property. This will provide pedestrians with safe access to the site.

#### 5.3 Traffic Counts

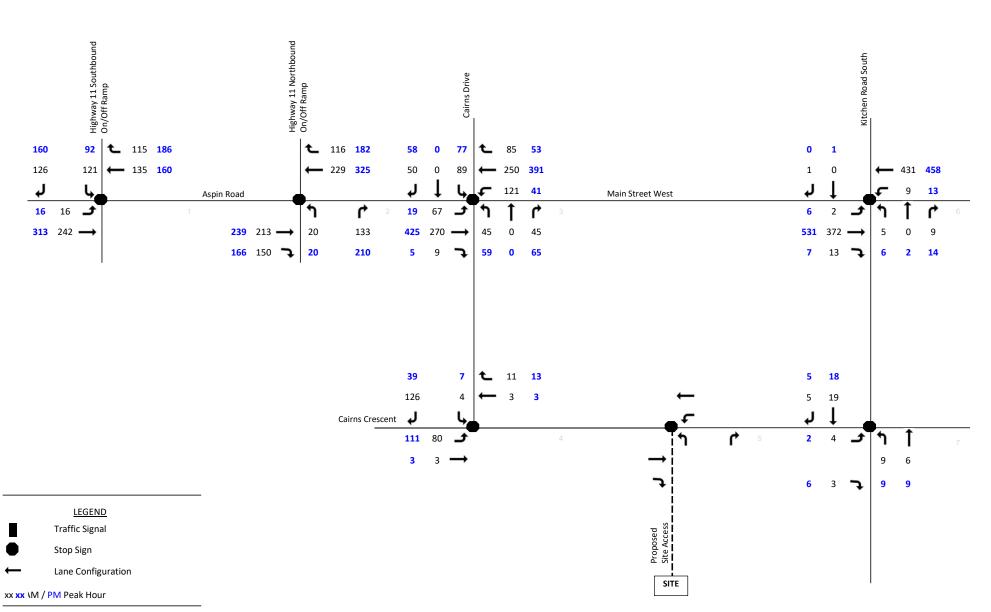
Turning movement counts (TMC) were conducted by Trans-Plan, as summarized in Table 1, since recent TMC data were unavailable from MTO and the town. Figure 4 shows the balanced volumes for the weekday AM and PM peak hours, where the highest counted intersection volumes were used to be conservative and were balanced across the entire network. The raw count data is provided in Appendix D.

Table 1 – Current Intersection Turning Movement Counts

Intersection	Count Date	Peak H	lours		
intersection	Count Date	AM	PM		
Aspdin Road & Highway 11		7:45 – 8:45	16:00 – 17:00		
Northbound Ramp		7.43 - 8.43	10.00 – 17.00		
Aspdin Road & Highway 11		7:45 – 8:45	16:00 – 17:00		
Southbound Ramp	Friday	7.43 - 8.43	10.00 – 17.00		
Main Street West & Cairns Drive	August 25, 2023	7:45 – 8:45	16:00 – 17:00		
Cairns Crescent & Cairns Drive		7:45 – 8:45	16:15 – 17:15		
Cairns Crescent & Kitchen Road		7:45 – 8:45	17:00 – 18:00		
South		7:45 - 8:45	17:00 - 18:00		
Main Street West & Kitchen Road	Thursday	8:30 – 9:30	16:15 – 17:15		
South	July 03, 2025	8.30 - 9.30	10.15 - 17:15		



# Figure 4: Balanced Existing Traffic Volumes, Weekday AM and PM Peak Hours





#### 6. FUTURE BACKGROUND CONDITIONS

Future background traffic volumes were determined based on a review of other area developments and background traffic corridor growth. Planned roadway improvements are also reviewed in this section.

#### 6.1 Horizon Years

The estimated build-out year for the proposed development is 2028. The future traffic analysis was conducted at estimated build-out (2028), a 5-year (2033), and a 10-year (2038) planning horizon after full build-out.

## 6.2 Background Growth Rate

A conservative two percent growth rate per annum has been applied to all study area roadway volumes for the horizon years. The conservative growth rate accounts for any potential development in the surrounding areas

The application of a 2.0% annual background growth rate is supported by empirical data collected by the Ministry of Transportation Ontario (MTO), presented in Table 2.

Table 2 - MTO Historical Data

Intersection	Count Year	AADT	SADT
Highway 11/ Muskoka	2013	17,226	20,262
Road 3	2016	18,288	21,324
Annual	Growth	2.01%	1.72%

As shown in Table 2, permanent count data at the Highway 11 / Muskoka Road 3 intersection indicates an average annual AADT growth rate of 2.01% between 2013 and 2016. This location is situated within close proximity to the study area and is functionally connected to the same regional travel network, making it a relevant and representative data source. Notably, SADT volumes at this location are approximately 10–15% higher than the corresponding AADT values, reflecting the significant seasonal tourism traffic experienced in the District of Muskoka.

In light of this recent growth trend and the higher summer traffic volumes, the selection of a 2.0% annual growth rate based on AADT is both reasonable and conservative. Using the lower AADT values as the growth basis ensures that forecasts remain robust for year-round conditions while avoiding underestimation of traffic demands during peak summer periods. This approach is directly grounded in verifiable count data from a comparable location and maintains the robustness of the analysis for future horizon year projections.

#### 6.3 Background Developments

According to the District of Muskoka Development Applications map, there are three planned developments near the site. However, the Town was only able to provide information for two of them: Huntsville Highlands Estates, located south of the site, and Huntsville Highway Commercial, located to the north along Main Street West. These are included in the analysis of the background conditions.



# 6.4 Planned Roadway and Transit Improvements

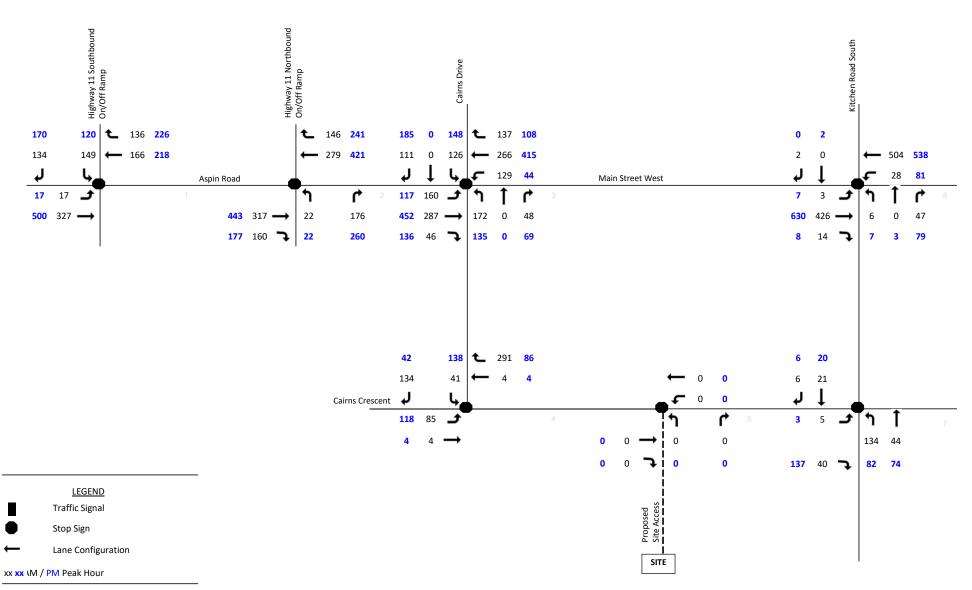
There are currently no planned roadway or transit improvements within the study area, based on a review of the Town of Huntsville Official Plan (adopted March 18, 2019). The review of transportation policies and infrastructure priorities in the Official Plan did not identify any planned improvements for Muskoka Road 3, Kitchen Road South, or other study road networks. To confirm these findings, the Town of Huntsville was contacted regarding potential planned works; however, no response was received at the time of completion of this report.

Based on this review of future background conditions, projected weekday AM and PM peak-hour traffic volumes for the horizon years, 2028, 2033, and 2038 are presented in Figure 5 to Figure 7.





Figure 5: 2028 Future Background Traffic Volumes, Weekday AM and PM Peak Hours

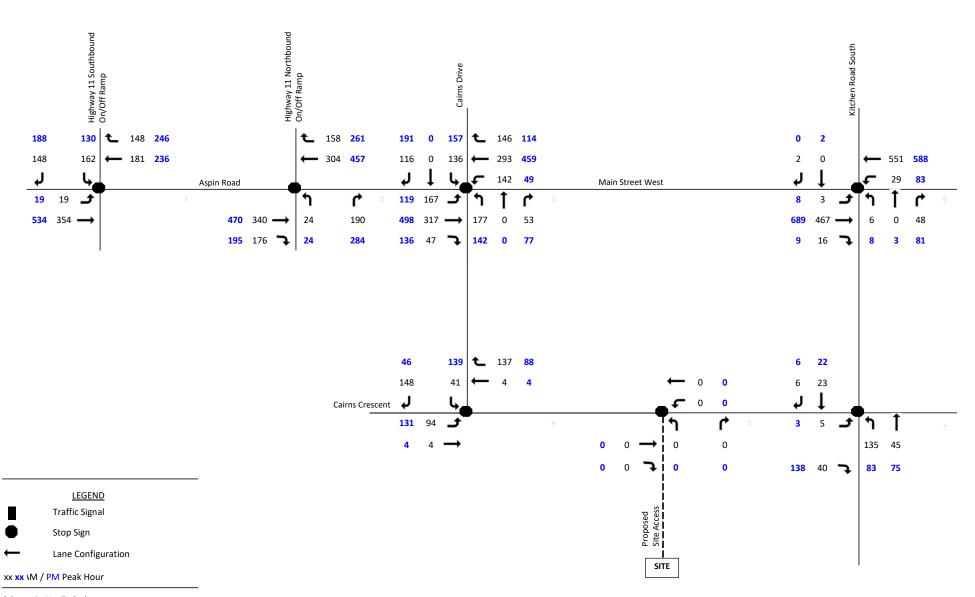


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Figure 6: 2033 Future Background Traffic Volumes, Weekday AM and PM Peak Hours

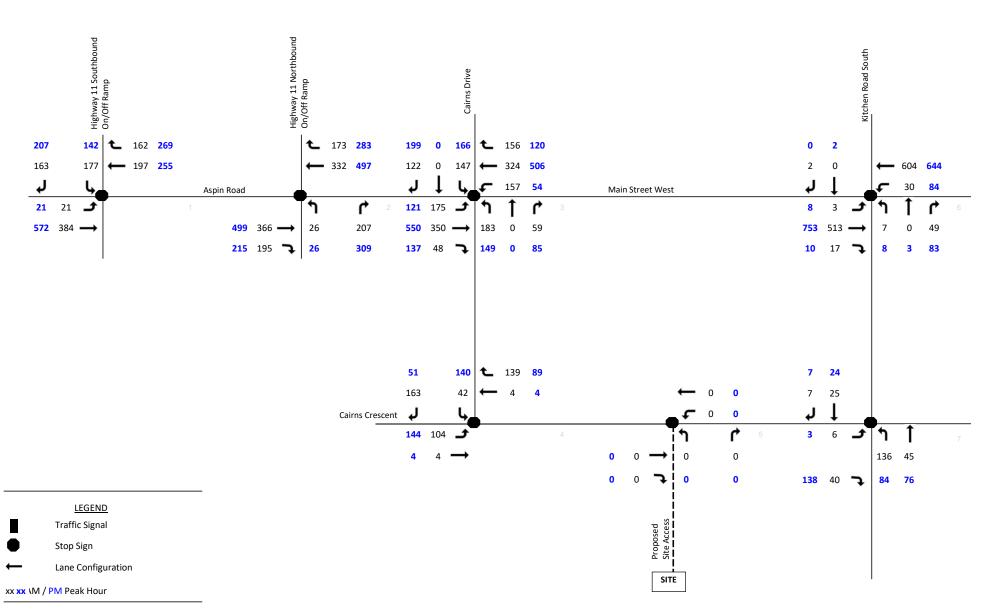


Schematic; Not To Scale





# Figure 7: 2038 Future Background Traffic Volumes, Weekday AM and PM Peak Hours





#### 7. SITE TRAFFIC

# 7.1 Trip Generation

Site trips for the proposed development were generated using the Institute of Transportation Engineers (ITE) Trip Generation manuals, 11<sup>th</sup> Edition. The ITE Land Use Codes (LUC) 221 for Multifamily Housing (Mid-Rise) were utilized. The site trip generation is shown in Table 3.

Table 3 – Trip Generation, Proposed Residential Development

Land Use	Size		Al	M Peak H	lour	PI	M Peak F	lour
			In	Out	Total	In	Out	Total
Multifamily Housing (Mid-rise)	176	Distribution	23%	77%	100%	61%	39%	100%
LUC 221	(Units)	Equation	T =	0.44(X) -	11.61	T =	0.39(X) +	- 0.34
		Rate	0.08	0.29	0.38	8.53	5.46	13.99
		Trips	15	51	66	42	27	69

The proposed development is expected to generate approximately 66 and 69 new two-way trips in the weekday AM and PM peak hours, respectively.

# 7.2 Trip Distribution and Assignment

Trip distribution and assignment for the proposed development at 20 Cairns Crescent were determined based on the configuration of the local road network, proximity to regional connections such as Highway 11, and surrounding land uses. These include residential neighbourhoods to the east along Kitchen Road South, commercial establishments to the north and west along Main Street West, and a large area of undeveloped green space to the south. The site will be accessed via the proposed site access on Cairns Crescent.

The majority of outbound traffic is expected to travel north via Kitchen Road South, then connect to Main Street West, where traffic disperses west toward Highway 11 or northeast into the Town of Huntsville. The Highway 11 corridor—running in a north-south direction—serves as a key regional link to destinations such as North Bay and Barrie. Northeast-bound traffic from the site is directed toward Huntsville's commercial core, which includes Riverside Public School, Huntsville District Memorial Hospital, and various municipal and retail services. This assignment pattern aligns with expected commuter flows toward nearby residential areas, commercial nodes, and key institutional destinations, while avoiding unnecessary routing through undeveloped or low-traffic areas such as the green space to the south. The traffic assignment and distribution are shown in Figure 8.

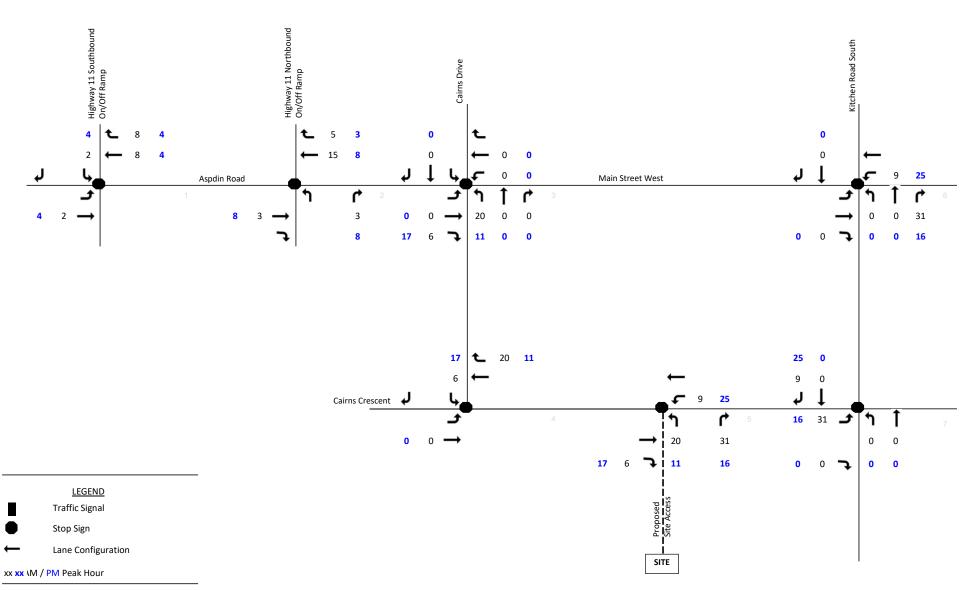
#### 8. FUTURE TOTAL TRAFFIC CONDITIONS

Future total traffic volumes were calculated by combining site-generated traffic with future background traffic. These volumes are illustrated in Figure 9 to Figure 11 for the 2028, 2033, and 2038 horizon years during the weekday AM and PM peak hours.





Figure 8: Site Traffic Volume Assignment, Weekday AM and PM Peak Hours

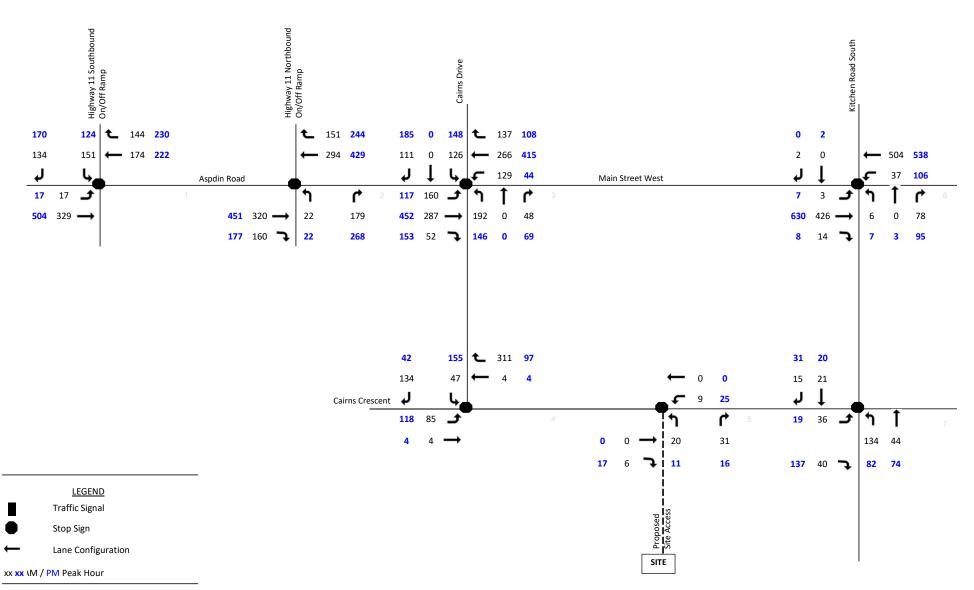


Schematic; Not To Scale





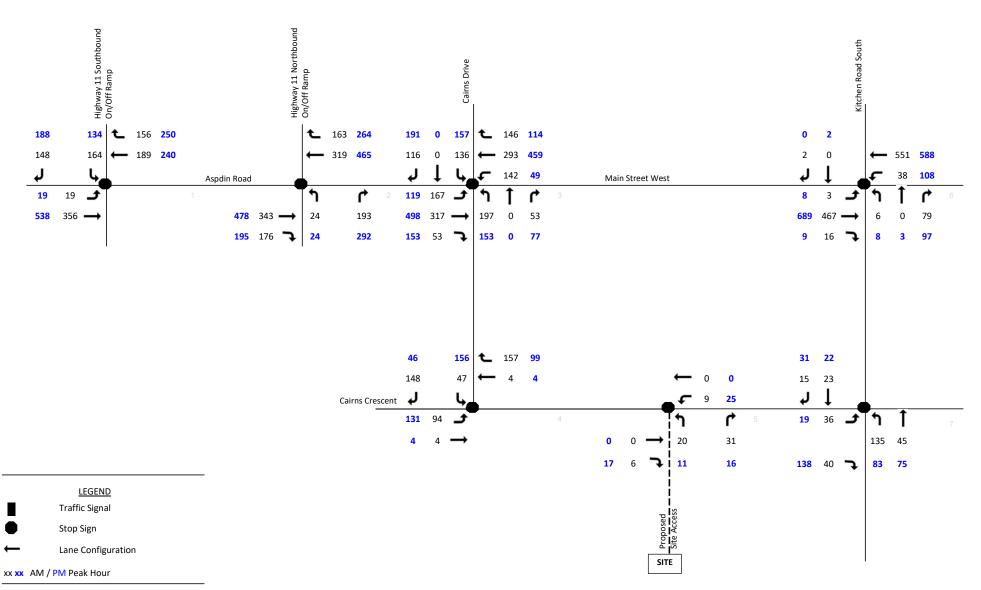
Figure 9: Future 2028 Total Traffic Volume Assignment, Weekday AM and PM Peak Hours







# Figure 10: Future 2033 Total Traffic Volume Assignment, Weekday AM and PM Peak Hours

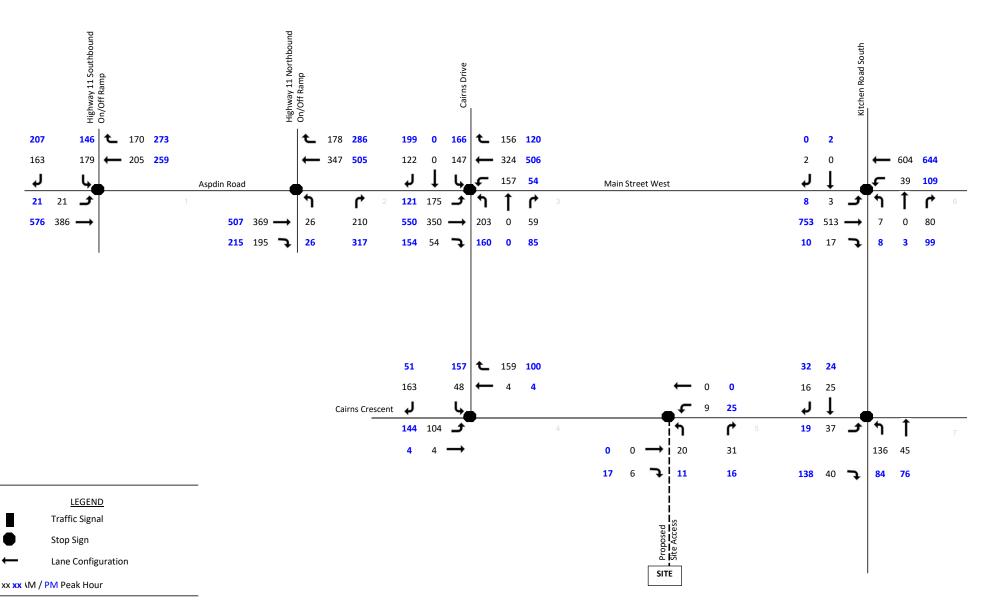


Schematic; Not To Scale





# Figure 11: Future 2038 Total Traffic Volume Assignment, Weekday AM and PM Peak Hours





### 9. CAPACITY AND VEHICLE QUEUING ANALYSIS

# 9.1 Capacity Analysis

A capacity analysis was performed for the study area intersections and site driveways using Synchro 12 analysis software. The capacity analysis output sheets and level of service (LOS) definitions are provided in Appendix E and Appendix F, respectively. The results for existing conditions and the horizon years, 2028, 2033, and 2038, are shown in Table 4 to Table 6.

The MTO TIS Guidelines, dated March 2023, state that "For ramps, a v/c ratio for terminal ramp approaches with a value greater than 0.75 would be deemed critical and shall be evaluated for possible operational improvements." For intersections not within the jurisdiction of MTO, a level-of-service (LOS) of D or better, or a volume-to-capacity (v/c) ratio of 0.85 or better is generally acceptable for individual movements and the overall intersection. The critical overall intersections and/or individual movements are highlighted in the analysis, and operational improvements have been recommended, as needed.

The capacity analysis results are summarized as follows:

#### Highway 11 Southbound On/Off-Ramp & Aspdin Road

## **Existing Traffic Conditions**

The southbound left/right movement currently operates at LOS C in the weekday AM peak with 16 seconds of delay, and at LOS C in the PM peak with 18 seconds of delay. All other movements (eastbound through, westbound through, and westbound right) operate at LOS A with minimal delays.

# **Future 2028 Traffic Conditions**

By 2028, the southbound left/right movement is expected to operate at LOS D in the AM peak and PM peak hours with 27 seconds and 32 seconds of delay, respectively. All other movements will continue to operate at LOS A with minimal delays.

# **Future 2033 Traffic Conditions**

In 2033, the southbound left/right movement is projected to operate at LOS E in the AM peak and PM peak hours with a delay of 38 seconds and 47 seconds, respectively. All other movements remain at LOS A with minimal delays.

#### **Future 2038 Traffic Conditions**

By 2038, the southbound left/right movement will decline to LOS F during both AM and PM peak periods, with delays of 65 seconds and 81 seconds, respectively. Eastbound and westbound movements are expected to continue operating at LOS A with negligible delays.

# Highway 11 Northbound Off-Ramp & Aspdin Road

#### **Existing Traffic Conditions**

The intersection currently operates at acceptable levels during both AM and PM peak periods. The northbound left/right movement operates at LOS B with delays of 12 seconds in the AM peak and 14 seconds in the PM peak. All other movements operate at LOS A with no delays.



### **Future 2028 Traffic Conditions**

In 2028, the northbound left/right movement is projected to operate at LOS B in the AM peak with 15 seconds of delay, and LOS D in the PM peak with 30 seconds of delay. All other movements maintain LOS A with no delays.

# **Future 2033 Traffic Conditions**

By 2033, delays for the northbound left/right movement increase to 17 seconds in the AM peak (LOS C) and 42 seconds in the PM peak (LOS E). All other movements continue to operate at LOS A with no delays.

# **Future 2038 Traffic Conditions**

In 2038, the northbound left/right movement operates at LOS C in the AM peak with 19 seconds of delay and degrades to LOS F in the PM peak with 66 seconds of delay. All other movements remain at LOS A with no delays.

# **Cairns Drive & Main Street West**

## **Existing Traffic Conditions**

The intersection currently operates efficiently during both weekday AM and PM peak hours. Most movements perform at Level of Service (LOS) A with minimal delays. The northbound left movement operates at LOS D, with delays of 27 seconds (AM) and 19 seconds (PM). The northbound through/right movement operates at LOS B in both peak hours, with delays of 10 seconds (AM) and 13 seconds (PM). The southbound through/left/right movement operates at LOS C with 25 seconds (AM) and 21 seconds (PM) delays.

# **Future 2028 Traffic Conditions**

By 2028, traffic volumes will increase, leading to more significant delays, particularly for the northbound and southbound approaches. The northbound left movement deteriorates to LOS F, with delays exceeding 14 minutes (>840 seconds) in the AM and 706 seconds (LOS F) in the PM. The northbound through/right movement remains at LOS B, with delays of 11 seconds (AM) and 13 seconds (PM). The southbound through/left/right movement drops to LOS F, with 184 seconds (AM) and 225 seconds (PM) delays. All other movements continue to operate at LOS A.

## **Future 2033 Traffic Conditions**

In 2033, intersection performance worsens further. The northbound left remains at LOS F, with delays still exceeding 14 minutes in the AM and in the PM peak hours. The southbound through/left/right movement also stays at LOS F, with delays of 475 seconds (AM) and 377 seconds (PM). The northbound through/right movement continues to operate at LOS B, with 11 seconds (AM) and 14 seconds (PM) delays. All other movements continue to perform at LOS A.

#### **Future 2038 Traffic Conditions**

By 2038, the intersection faces critical congestion issues. The northbound left movement continues to operate at LOS F in both AM and PM peaks. The southbound through/left/right movement remains at LOS F. The northbound through/right movement holds at LOS B, with 11 seconds (AM) and 15 seconds (PM) of delay. All remaining movements operate at LOS A, with no significant changes in delay.



In summary, most movements at the intersection will continue to operate well, but the northbound left and southbound through/left/right will drop to LOS F in the future due to added traffic from growth and new developments, causing major delays.

# **Cairns Crescent & Cairns Drive**

# **Existing Traffic Conditions**

The intersection operates well during both AM and PM peak periods. All movements operate at LOS A with minimal delays.

# **Future 2028 Traffic Conditions**

By 2028, the southbound left/right movement remains at LOS B with delays increasing slightly to 13 seconds in the AM peak and 14 seconds in the PM peak. All other movements continue to operate at LOS A with negligible delays.

# **Future 2033 Traffic Conditions**

In 2033, the southbound left/right movement continues at LOS B with delays of 11 seconds (AM) and 15 seconds (PM). Other movements remain at LOS A.

# **Future 2038 Traffic Conditions**

In 2038, the southbound left/right movement operates at LOS B with delays increasing slightly to 16 seconds in the PM peak and 12 seconds in the AM peak. All other movements maintain LOS A with minimal delays.

#### Kitchen Road South & Main Street West

#### **Existing Traffic Conditions**

The intersection currently operates satisfactorily during both AM and PM peak periods. The northbound right/through/left movement operates at LOS B with delays of 12 seconds in the AM peak and 14 seconds in the PM peak. The southbound through/right movement operates at LOS B with delays of 11 seconds in the AM peak and 15 seconds in the PM peak. All other movements operate at LOS A with minimal to no delays.

## **Future 2028 Traffic Conditions**

By 2028, the northbound right/through/left movement is expected to operate at LOS C during the PM peak with delays increasing to 23 seconds, while maintaining LOS B with 15 seconds delay in the AM peak. The southbound through/right movement remains at LOS B with delays of 12 seconds (AM) and 20 seconds (PM). All other movements continue to operate at LOS A with minimal delays.

#### **Future 2033 Traffic Conditions**

In 2033, delays for the northbound right/through/left movement increase to 15 seconds (LOS C) in the AM peak and 28 seconds (LOS D) in the PM peak. The southbound through/right movement experiences delays of 12 seconds (LOS B) in the AM and 22 seconds (LOS C) in the PM peak. All other movements continue to operate at LOS A.



### **Future 2038 Traffic Conditions**

By 2038, the northbound right/through/left movement shows further delay increases to 17 seconds (LOS C) in the AM peak and 34 seconds (LOS D) in the PM peak. The southbound through/right movement remains at LOS B in the AM peak with 13 seconds delay and LOS C in the PM peak with 24 seconds delay. All other movements continue to operate at LOS A.

#### **Kitchen Road South & Cairns Crescent**

# **Existing Traffic Conditions**

The intersection currently operates satisfactorily during both AM and PM peak periods. All movements operate at LOS A with minimal to no delays.

### **Future 2028 Traffic Conditions**

In 2028, the eastbound left/right movement is projected to operate at LOS B with delays increasing slightly to 14 seconds in the AM peak and 11 seconds in the PM peak. The northbound through/left and southbound through/right movements maintain LOS A with minimal delay increases.

#### **Future 2033 Traffic Conditions**

By 2033, the eastbound left/right movement continues to operate at LOS B with delays of 14 seconds (AM) and 10 seconds (PM). The northbound through/left and southbound through/right movements remain at LOS A with minimal delays.

# **Future 2038 Traffic Conditions**

In 2038, the eastbound left/right movement maintains LOS B with delays around 14 seconds (AM) and 11 seconds (PM). The northbound through/left and southbound through/right movements continue to operate at LOS A with minimal delays.

#### **Site Access & Cairns Crescent**

## **Future 2028 Traffic Conditions**

In 2028, all movements at the intersection, including eastbound through/right, westbound through/left, and northbound left/right, are projected to operate at LOS A with negligible delays of up to 9 seconds during both AM and PM peak periods.

#### **Future 2033 Traffic Conditions**

By 2033, all movements continue to operate at LOS A with minimal delays, remaining consistent with the 2028 projections.

# **Future 2038 Traffic Conditions**

In 2038, the intersection maintains LOS A for all movements, with delays remaining low (0 to 8 seconds) during both peak periods, indicating stable and efficient traffic flow.



Intersection		Exis	sting Traff	fic Condit	ions			2028 Bac	kground	Traffic Co	nditions			2028	Total Tra	ffic Condi	itions	
Movement	Weekd	lay AM Pe	ak Hour	Weeko	day PM Pe	ak Hour	Week	day AM Pea	ak Hour	Weekd	ay PM Pea	ak Hour	Weekd	lay AM Pea	k Hour	Weekd	lay PM Pea	ak Hour
	V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS
Aspin Road & Highway 11 Southbound Off-		•																-
Ramp																		
Eastbound Through	0.02	8	Α	0.02	8	Α	0.02	8	Α	0.02	8	Α	0.02	9	Α	0.02	8	Α
Eastbound Left	0.17	0	Α	0.24	0	Α	0.23	0	Α	0.38	0	Α	0.23	0	Α	0.39	0	Α
Westbound Through	0.08	0	Α	0.11	0	Α	0.10	0	Α	0.15	0	Α	0.11	0	Α	0.15	0	Α
Westbound Right	0.07	0	Α	0.13	0	Α	0.09	0	Α	0.15	0	Α	0.09	0	Α	0.16	0	Α
Southbound Left / Right	0.53	16	С	0.44	18	В	0.72	26	D	0.7	30	D	0.73	27	D	0.72	32	D
Aspin Road & Highway 11 Northbound Off-																		
Ramp																		
Eastbound Through	0.14	0	Α	0.17	0	Α	0.21	0	Α	0.31	0	Α	0.21	0	Α	0.32	0	Α
Eastbound Right	0.10	0	Α	0.12	0	Α	0.11	0	Α	0.13	0	Α	0.11	0	Α	0.13	0	Α
Westbound Through	0.14	0	Α	0.21	0	Α	0.18	0	Α	0.28	0	Α	0.19	0	Α	0.28	0	Α
Westbound Right	0.07	0	Α	0.12	0	Α	0.09	0	Α	0.16	0	Α	0.10	0	Α	0.16	0	Α
Northbound Left / Right	0.27	12	В	0.4	14	В	0.41	15	С	0.7	28	D	0.42	15	С	0.73	30	D
Cairns Drive & Main Street West																		
Eastbound Left	0.06	8	Α	0.02	8	Α	0.16	9	Α	0.14	9	Α	0.16	9	Α	0.14	9	Α
Eastbound Through	0.17	0	Α	0.29	0	Α	0.18	0	Α	0.31	0	Α	0.18	0	Α	0.31	0	Α
Eastbound Right	0.01	0	Α	0.00	0	Α	0.03	0	Α	0.09	0	Α	0.03	0	Α	0.11	0	Α
Westbound Left	0.12	8	Α	0.04	9	Α	0.14	9	Α	0.05	9	Α	0.14	9	Α	0.05	9	Α
Westbound Through	0.22	0	Α	0.28	0	Α	0.27	0	Α	0.33	0	Α	0.27	0	Α	0.33	0	Α
Northbound Left	0.44	27	D	0.25	19	С	4.25	>14mins	F	2.14	626	F	4.75	>14mins	F	2.33	706	F
Northbound Through / Right	0.10	10	В	0.16	13	В	0.11	10	В	0.18	13	В	0.11	11	В	0.18	13	В
Southbound Through / Left / Right	0.46	25	С	0.42	21	С	1.23	184	F	1.38	225	F	1.23	184	F	1.38	225	F
Cairns Crescent & Cairns Drive																		
Eastbound Through / Left	0.06	7	Α	0.09	7	Α	0.09	9	Α	0.10	7	Α	0.09	9	Α	0.10	8	Α
Westbound Through / Right	0.01	0	Α	0.01	0	Α	0.29	0	Α	0.06	0	Α	0.31	0	Α	0.07	0	Α
Southbound Left / Right	0.15	9	Α	0.05	9	Α	0.30	12	В	0.33	13	В	0.32	13	В	0.36	14	В
Site Access & Cairns Crescent																		
Eastbound Through / Right							0.00	0	Α	0.00	0	Α	0.00	0	Α	0.01	0	Α
Westbound Through / Left							0.00	0	Α	0.00	0	Α	0.00	7	Α	0.02	7	Α
Northbound Left / Right							0.00	0	Α	0.00	0	Α	0.02	9	Α	0.03	8	Α
Kitchen Road South & Main Street West																		
Eastbound Left	0.00	8	Α	0.01	8	Α	0.00	9	Α	0.01	9	Α	0.00	9	Α	0.01	9	Α
Eastbound Through / Right	0.00	0	A	0.36	0	A	0.33	0	A	0.43	0	A	0.33	0	A	0.01	0	A
Westbound Left	0.23	8	A	0.01	9	A	0.03	9	Ā	0.10	10	A	0.04	9	A	0.43	10	A
Westbound Through	0.29	0	A	0.01	0	A	0.34	0	A	0.34	0	A	0.34	0	A	0.13	0	A
Northbound Right / Through / Left	0.04	12	В	0.10	14	В	0.16	14	В	0.44	21	Ċ	0.25	15	В	0.52	23	c
Southbound Through / Right	0.00	11	В	0.01	15	В	0.01	12	В	0.02	19	C	0.01	12	В	0.02	20	C
Kitchen Road South & Cairns Crescent	2.00			5.01			1			5.02			1 3.01			5.02		
Eastbound Left / Right	0.02	9	Α	0.02	9	Α	0.13	11	В	0.27	10	Α	0.28	14	В	0.34	11	В
Northbound Through / Left	0.01	5	A	0.01	4	A	0.13	6	A	0.08	4	A	0.14	6	A	0.08	4	A
Southbound Through / Right	0.02	0	A	0.02	0	A	0.03	0	A	0.02	0	A	0.04	0	A	0.04	0	A



Intersection		Exi	sting Traff	fic Condit	ions			2033 Ba	ckground	Traffic Co	onditions			2033	Total Tra	ffic Cond	itions	
Movement	Weekd	ay AM Pe	ak Hour	Week	day PM Pe	ak Hour	Week	day AM Pe	ak Hour	Weeko	lay PM Pea	k Hour	Weekd	lay AM Pea	k Hour	Weeko	lay PM Pe	ak Hour
ĺ	V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS
Aspin Road & Highway 11 Southbound Off-		•	•			•		•			•						•	
Ramp																		
Eastbound Through	0.02	8	Α	0.02	8	Α	0.02	8	Α	0.02	8	Α	0.02	8	Α	0.02	8	Α
Eastbound Left	0.17	0	Α	0.24	0	Α	0.24	0	Α	0.41	0	Α	0.25	0	Α	0.41	0	Α
Westbound Through	0.08	0	Α	0.11	0	Α	0.11	0	Α	0.16	0	Α	0.12	0	Α	0.16	0	Α
Westbound Right	0.07	0	Α	0.13	0	Α	0.09	0	Α	0.17	0	Α	0.10	0	Α	0.17	0	Α
Southbound Left / Right	0.53	16	С	0.44	18	В	0.83	36	Е	0.83	43	Ε	0.84	38	Е	0.85	47	Е
Aspin Road & Highway 11 Northbound Off-																		
Ramp																		
Eastbound Through	0.14	0	Α	0.17	0	Α	0.23	0	Α	0.33	0	Α	0.23	0	Α	0.34	0	Α
Eastbound Right	0.10	0	Α	0.12	0	Α	0.12	0	Α	0.14	0	Α	0.12	0	Α	0.14	0	Α
Westbound Through	0.14	0	Α	0.21	0	Α	0.19	0	Α	0.30	0	Α	0.20	0	Α	0.31	0	Α
Westbound Right	0.07	0	Α	0.12	0	Α	0.10	0	Α	0.17	0	Α	0.10	0	Α	0.17	0	Α
Northbound Left / Right	0.27	12	В	0.4	14	В	0.49	17	С	0.80	38	Ε	0.47	17	С	0.84	42	Е
Cairns Drive & Main Street West																		
Eastbound Left	0.06	8	Α	0.02	8	Α	0.17	9	Α	0.14	9	Α	0.17	9	Α	0.14	9	Α
Eastbound Through	0.17	0	Α	0.29	0	Α	0.20	0	Α	0.34	0	Α	0.20	0	Α	0.34	0	Α
Eastbound Right	0.01	0	Α	0.00	0	Α	0.03	0	Α	0.09	0	Α	0.03	0	Α	0.11	0	Α
Westbound Left	0.12	8	Α	0.04	9	Α	0.16	9	Α	0.06	9	Α	0.16	9	Α	0.06	10	Α
Westbound Through	0.22	0	Α	0.28	0	Α	0.29	0	Α	0.37	0	Α	0.29	0	Α	0.37	0	Α
Northbound Left	0.44	27	D	0.25	19	С	7.06	>14mins	F	3.65	>14mins	F	7.88	>14mins	F	3.95	>14mins	F
Northbound Through / Right	0.10	10	В	0.16	13	В	0.13	11	В	0.21	14	В	0.13	11	В	0.21	14	В
Southbound Through / Left / Right	0.46	25	С	0.42	21	С	1.89	475	F	1.72	377	F	1.89	475	F	1.72	377	F
Cairns Crescent & Cairns Drive																		
Eastbound Through / Left	0.06	7	Α	0.09	7	Α	0.08	8	Α	0.11	8	Α	0.08	8	Α	0.11	8	Α
Westbound Through / Right	0.01	0	Α	0.01	0	Α	0.14	0	Α	0.06	0	Α	0.16	0	Α	0.07	0	Α
Southbound Left / Right	0.15	9	Α	0.05	9	Α	0.28	11	В	0.35	14	В	0.29	11	В	0.39	15	В
Site Access & Cairns Crescent																		
Eastbound Through / Right							0.00	0	Α	0.00	0	Α	0.00	0	Α	0.01	0	Α
Westbound Through / Left							0.00	0	Α	0.00	0	Α	0.00	7	Α	0.02	7	Α
Northbound Left / Right							0.00	0	Α	0.00	0	Α	0.02	8	Α	0.03	8	Α
Kitchen Road South & Main Street West																		
Eastbound Left	0.00	8	Α	0.01	8	Α	0.00	9	Α	0.01	9	Α	0.00	9	Α	0.01	9	А
Eastbound Through / Right	0.29	0	A	0.36	0	A	0.36	0	A	0.47	0	A	0.36	0	A	0.47	0	A
Westbound Left	0.01	8	A	0.01	9	A	0.03	9	A	0.11	10	A	0.04	9	A	0.14	10	В
Westbound Through	0.29	0	A	0.29	0	A	0.37	0	A	0.37	0	A	0.37	0	A	0.37	0	A
Northbound Right / Through / Left	0.04	12	В	0.10	14	В	0.18	14	В	0.50	24	C	0.28	15	C	0.59	28	D
Southbound Through / Right	0.00	11	В	0.01	15	В	0.01	12	В	0.02	20	C	0.01	12	В	0.02	22	C
Kitchen Road South & Cairns Crescent													T					
Eastbound Left / Right	0.02	9	Α	0.02	9	Α	0.12	11	В	0.28	10	Α	0.28	14	В	0.34	10	В
Northbound Through / Left	0.01	5	Α	0.01	4	Α	0.14	6	A	0.08	4	Α	0.14	6	A	0.08	4	A
Southbound Through / Right	0.02	0	Α	0.02	0	Α	0.03	0	Α	0.02	0	Α	0.04	0	Α	0.04	0	Α



Intersection		Exi	sting Traf	fic Condit	ions			2038 Bad	kground	Traffic Co	onditions			2038	Total Tra	ffic Cond	itions	
Movement	Weekd	lay AM Pe			day PM Pe	ak Hour	Week	day AM Pe	ak Hour	Weeko	day PM Pea	k Hour	Weeko	lay AM Pea	k Hour	Week	lay PM Pe	ak Hour
	V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS
Aspin Road & Highway 11 Southbound Off-		•									•			•			•	
Ramp																		
Eastbound Through	0.02	8	Α	0.02	8	Α	0.02	8	Α	0.02	8	Α	0.02	8	Α	0.02	8	Α
Eastbound Left	0.17	0	Α	0.24	0	Α	0.27	0	Α	0.44	0	Α	0.27	0	Α	0.44	0	Α
Westbound Through	0.08	0	Α	0.11	0	Α	0.12	0	Α	0.17	0	Α	0.13	0	Α	0.18	0	Α
Westbound Right	0.07	0	Α	0.13	0	Α	0.10	0	Α	0.18	0	Α	0.11	0	Α	0.18	0	Α
Southbound Left / Right	0.53	16	С	0.44	18	В	0.97	60	F	0.98	73	F	0.98	65	F	1.01	81	F
Aspin Road & Highway 11 Northbound Off-																		
Ramp																		
Eastbound Through	0.14	0	Α	0.17	0	Α	0.24	0	Α	0.35	0	Α	0.25	0	Α	0.36	0	Α
Eastbound Right	0.10	0	Α	0.12	0	Α	0.13	0	Α	0.15	0	Α	0.13	0	Α	0.15	0	Α
Westbound Through	0.14	0	Α	0.21	0	Α	0.21	0	Α	0.33	0	Α	0.22	0	Α	0.33	0	Α
Westbound Right	0.07	0	Α	0.12	0	Α	0.11	0	Α	0.19	0	Α	0.11	0	Α	0.19	0	Α
Northbound Left / Right	0.27	12	В	0.4	14	В	0.53	19	С	0.93	58	F	0.54	19	С	0.96	66	F
Cairns Drive & Main Street West																		
Eastbound Left	0.06	8	Α	0.02	8	Α	0.18	9	Α	0.15	10	Α	0.18	9	Α	0.15	10	Α
Eastbound Through	0.17	0	Α	0.29	0	Α	0.22	0	Α	0.38	0	Α	0.22	0	Α	0.38	0	Α
Eastbound Right	0.01	0	Α	0.00	0	Α	0.03	0	Α	0.09	0	Α	0.03	0	Α	0.11	0	Α
Westbound Left	0.12	8	Α	0.04	9	Α	0.18	9	Α	0.07	10	Α	0.18	9	Α	0.07	10	Α
Westbound Through	0.22	0	Α	0.28	0	Α	0.32	0	Α	0.40	0	Α	0.32	0	Α	0.40	0	Α
Northbound Left	0.44	27	D	0.25	19	С	11.10	>14mins	F	8.24	>14mins	F	12.33	>14mins	F	8.87	>14mins	F
Northbound Through / Right	0.10	10	В	0.16	13	В	0.15	11	В	0.25	15	С	0.15	11	В	0.25	15	С
Southbound Through / Left / Right	0.46	25	С	0.42	21	С	3.91	>14mins	F	2.26	622	F	3.92	>14mins	F	2.26	622	F
Cairns Crescent & Cairns Drive																		
Eastbound Through / Left	0.06	7	Α	0.09	7	Α	0.09	8	Α	0.12	8	Α	0.09	8	Α	0.12	8	Α
Westbound Through / Right	0.01	0	Α	0.01	0	Α	0.14	0	Α	0.06	0	Α	0.16	0	Α	0.07	0	Α
Southbound Left / Right	0.15	9	Α	0.05	9	Α	0.30	11	В	0.38	15	В	0.32	12	В	0.42	16	С
Site Access & Cairns Crescent																		
Eastbound Through / Right							0.00	0	Α	0.00	0	Α	0.00	0	Α	0.01	0	Α
Westbound Through / Left							0.00	0	Α	0.00	0	Α	0.01	7	Α	0.02	7	Α
Northbound Left / Right							0.00	0	Α	0.00	0	Α	0.05	8	Α	0.03	8	Α
Kitchen Road South & Main Street West																		
Eastbound Left	0.00	8	Α	0.01	8	Α	0.00	9	Α	0.01	9	Α	0.00	9	Α	0.01	9	Α
Eastbound Through / Right	0.29	0	A	0.36	0	A	0.40	0	Ā	0.51	0	A	0.40	0	A	0.51	0	A
Westbound Left	0.01	8	A	0.01	9	A	0.04	9	A	0.11	10	A	0.05	9	A	0.15	10	В
Westbound Through	0.29	0	A	0.29	0	A	0.40	0	A	0.41	0	В	0.40	0	A	0.41	0	A
Northbound Right / Through / Left	0.04	12	В	0.10	14	В	0.20	16	C	0.56	29	D	0.31	17	C	0.66	34	D
Southbound Through / Right	0.00	11	В	0.01	15	В	0.01	13	В	0.02	22	C	0.01	13	В	0.03	24	C
Kitchen Road South & Cairns Crescent	2.00			1			1			1.02			1			2.00		
Eastbound Left / Right	0.02	9	Α	0.02	9	Α	0.14	11	В	0.28	10	Α	0.29	14	В	0.34	11	В
Northbound Through / Left	0.01	5	A	0.01	4	A	0.14	6	A	0.08	4	A	0.14	6	A	0.08	4	A
Southbound Through / Right	0.02	0	A	0.02	0	A	0.03	0	A	0.02	0	A	0.04	0	A	0.04	0	A



#### 10. PARKING STUDY

# 10.1 Parking Requirements

The site parking requirement was reviewed based on the Town of Huntsville Community Planning Permit By-Law Amendment CPPA/20/2025/HTE. As stated in the Town of Huntsville Staff Report dated July 16, 2025, the parking provisions have been amended to allow for a reduction in required parking spaces for multiple residential rental developments. Specifically, the by-law permits a rate of 1.0 space per dwelling unit for standard rental housing and a further reduced rate of 0.75 spaces per unit for units designated as affordable rental housing. Excerpts of the by-law amendment are provided in Appendix G. A comparison of the parking requirements and the proposed parking supply is shown in Table 7.

Table 7 – Parking Requirements, Town of Huntsville Zoning By-law

		Minimum Parking R	Provided	Deficiency			
Use	Size	Rate	Required Spaces	Spaces	/Surplus		
Residential	176 units	1 space per unit PLUS 1 space per 5 units	212	211	-1		

Source: Town of Huntsville Community Planning Permit By-Law Amendment CPPA/20/2025/HTE.

The proposed development includes a total of 211 parking spaces, consisting of 176 residential spaces (one space per unit) and 35 visitor spaces (0.2 spaces per unit). Based on the parking requirement of 1 space per unit plus 1 space per 5 units, the development requires a total of 212 spaces—176 for residents and 36 for visitors. As such, the proposal results in a minor deficiency of 1 parking space, which represents approximately 0.47% below the minimum requirement.

A parking utilization survey was conducted at other comparable apartment buildings within the Town to assess actual parking demand. Additionally, residential parking rates were reviewed and compared with those of similar municipalities to evaluate the adequacy of the proposed supply. Despite the small shortfall, the proposed parking is expected to adequately serve the development based on observed demand patterns and comparative benchmarks.

#### 10.2 Impact of Affordable Housing on Parking Requirements

The proposed development includes the potential for 25% of the units to be delivered as affordable rental housing, in alignment with the Town of Huntsville's broader housing objectives. Table 8 shows the calculation of parking requirements under this scenario and identifies the resulting surplus or deficiency in parking supply.



Table 8 – Parking Calculation under 25% Affordable Housing Provision

Use Total Size		No. of Affordable	Minimum Require	•	Provided	Deficiency (-)	
Use	Total Size	Units	Rate	Required Spaces	Spaces	/Surplus (+)	
Residential	176 units	44 (25% of total)	0.75 space per unit PLUS 1 space per 5 units	201	211	+10	

If 25% of the 176 units (i.e., 44 units) are designated as affordable, the development qualifies for a reduced parking requirement under the Town's by-law. In this scenario, the total required parking is reduced to 201 spaces, resulting in a surplus of 10 spaces based on the proposed supply of 211 spaces.

This reduction recognizes the typically lower vehicle ownership rates associated with affordable housing. As a result, the proposed parking supply is expected to be sufficient under both the standard and affordable housing scenarios—and is particularly conservative if affordable units are included.

To assess the adequacy of the proposed parking supply beyond the minimum regulatory requirements, a parking utilization survey was conducted at comparable residential developments in Huntsville. The results of that survey are presented in the following sections.

## 10.3 Parking Surveys at Proxy Site

To better understand the parking demand rates generated by residential buildings, parking demand surveys were conducted at an existing apartment building located nearby.

## **Proxy Site Selection**

Trans-Plan completed a thorough review of apartment buildings within the town and selected the following buildings to conduct parking demand surveys. Comparable residential developments in Huntsville that are located within 5km of the subject site were selected as proxy sites. The site statistics of the proxy developments, in comparison to the subject site, are summarized in Table 9.



Table 9 – Proxy Site Statistics

Site	No. of Storeys	No. of Units	Parking Supply (spaces) Residential	
Subject Site	<u> </u>		nesidentia.	
20 Cairns Crescent	4	176	211	
Proxy Sites				
Laketree Residence at 210 Highway 60*	3	84	128	
Apartment at 23 & 25 Mary Street	3	12	18	
Hunters Bay Apartments at 4 Yonge Street North	3	25	36	

Note (\*): Visitor parking information is not available.

## Survey Methodology for Proxy Site

A parking demand survey was conducted on a weekday: Friday, July 4<sup>th</sup>, 2025. Parking surveys were conducted during peak periods (from 1 pm to midnight), given that visitor parking demands tend to peak from 1 pm to 7 pm, and residents' parking demands peak at midnight.

## Survey Results at Proxy Site

The survey results, showing the peak parking demand (maximum number of vehicles occupying the parking areas), are summarized in Table 10. The detailed survey results are shown in tabular form in Appendix H.

Table 10 – Peak Parking Demand Survey Results

		Observed Peak Parking Demand			
Proxy Site	Units	Spaces Occupied	Residential Rate		
210 Highway 60	84	81	0.96		
23 & 25 Mary Street	12	7	0.58		
4 Yonge Street North	25	20	0.80		
		Average	0.78		

The proxy residential site analysis indicated an average peak parking demand rate of 0.78 spaces per unit, which is substantially lower than the minimum parking requirements specified in the Town's Community Planning Permit By-law Amendment.



## 10.4 Estimated Future Parking Demand Results

The average parking demand rate observed from the proxy site was applied to the proposed site statistics to estimate future parking demands for the subject site, based on the survey parking rates, as shown in Table 11.

Table 11 – Estimated Parking Demands for the Subject Site

Subject Site Number	Parking Supply	Peak Demands from Survey Results	Estimated Parking Demands for Subject Site	Surplus (spaces)
of Units	Spaces	Surveyed Rate	Spaces	+74
176	211	0.78 spaces per unit	137	

Based on the observed average peak parking demand rate of 0.78 spaces per unit, the 176-unit subject site is projected to require approximately 137 spaces at peak demand. The proposed parking supply of 211 spaces exceeds this estimate by 74 spaces, resulting in a substantial surplus. This surplus indicates that the Town's prescribed parking requirement is conservative relative to actual demand observed in similar municipalities and is further supported by proxy site surveys undertaken at a comparable apartment building within the Town.

## 11. SITE ACCESS AND CIRCULATION REVIEW

## 11.1 Site Access Review according to Design Requirements

A geometric design review of the proposed development was conducted based on the requirements provided in the District Municipality of Muskoka's Engineering Design Criteria and Standards Manual (updated July 2024), specifically Figure 3: Non-Commercial Access Requirements. While no document from the Town of Huntsville was found that specifically outlines standards for site access design, the Muskoka manual includes a section titled "Policies and Procedures for Access onto District Roads", which covers such design standards. The source information is provided in Appendix I, while a comparison of the requirements and proposed dimensions is shown in Table 12.

Table 12 – Design Criteria and Access Requirement, District of Muskoka

Criteria	Requirement	Proposed	
Citeria	District of Muskoka	oposeu	
Access Width	5 m – 6 m	6.7 m	
Corner Radii	1.5 m – 3 m	9 m	
Shoulder Width	1 m	1.5 m	
Clear Throat Length	No known specification	36 m	
Landscape Buffer	No known specification	3 m	

Sources: The District Municipality of Muskoka Engineering Design Criteria and Standards Manual (July 2024)



The proposed access design exceeds several of the District of Muskoka's standards, enhancing both functionality and safety. The access width of 6.7 metres surpasses the standard range of 5 to 6 metres, providing ample space for two-way vehicle movement without operational concerns. Similarly, the proposed 9-metre corner radius is well above the District's 1.5 to 3 metre standards, improving maneuverability and enabling smoother turning movements, particularly for larger vehicles. While the District does not specify a required access throat length, the design incorporates a 36-metre clear throat, ensuring efficient entry and exit while preventing queues from spilling onto adjacent roads. Additional features, including a 1.5-metre shoulder and a 3-metre landscape buffer, further exceed the District's specifications, contributing to the overall safety, efficiency, and visual quality of the access.

## 11.2 Site Circulation Review

A site circulation review was conducted using AutoTurn vehicle turning template software to demonstrate that design vehicles could access their corresponding areas and egress from the site. The following design vehicles were selected for the site circulation review:

- A typical fire emergency vehicle with a design length of 12.8m
- A medium-sized loading vehicle based on a medium single-unit ("MSU") truck in the TAC 2017 guidelines
- A typical rear-end waste collection vehicle with a design length of 10.7m
- A large passenger vehicle based on a passenger vehicle ("P") in the TAC 2017 guidelines

## Fire Emergency Vehicle

Figure 12 demonstrates a fire truck entering the site from Cairns Crescent and circulating the site before exiting via Cairns Crescent.

## **Loading Vehicles**

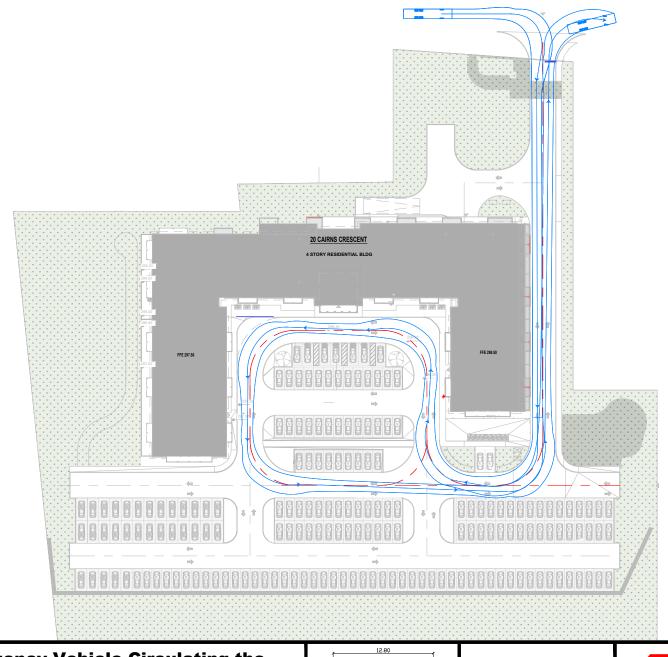
Figure 13 demonstrates a loading vehicle entering the site from Cairns Crescent and navigating towards the designated loading space. Figure 14 shows a loading vehicle leaving the loading space and exiting to Cairns Crescent.

## **Waste Collection Vehicles**

Figure 15 demonstrates a rear-end waste collection vehicle entering the site from Cairns Crescent and navigating towards the designated waste collection area located on the north side of the building. Figure 16 illustrates a waste collection vehicle reversing from the designated waste collection area and exiting to Cairns Crescent.

## Passenger Vehicles

Figure 17 to Figure 20 show a passenger vehicle entering the critical parking spaces on the ground floor and the basement parking areas.



# Figure 12 - Fire Emergency Vehicle Circulating the Site

PROPOSED RESIDENTIAL DEVELOPMENT 20 Cairns Crescent, Huntsville, ON

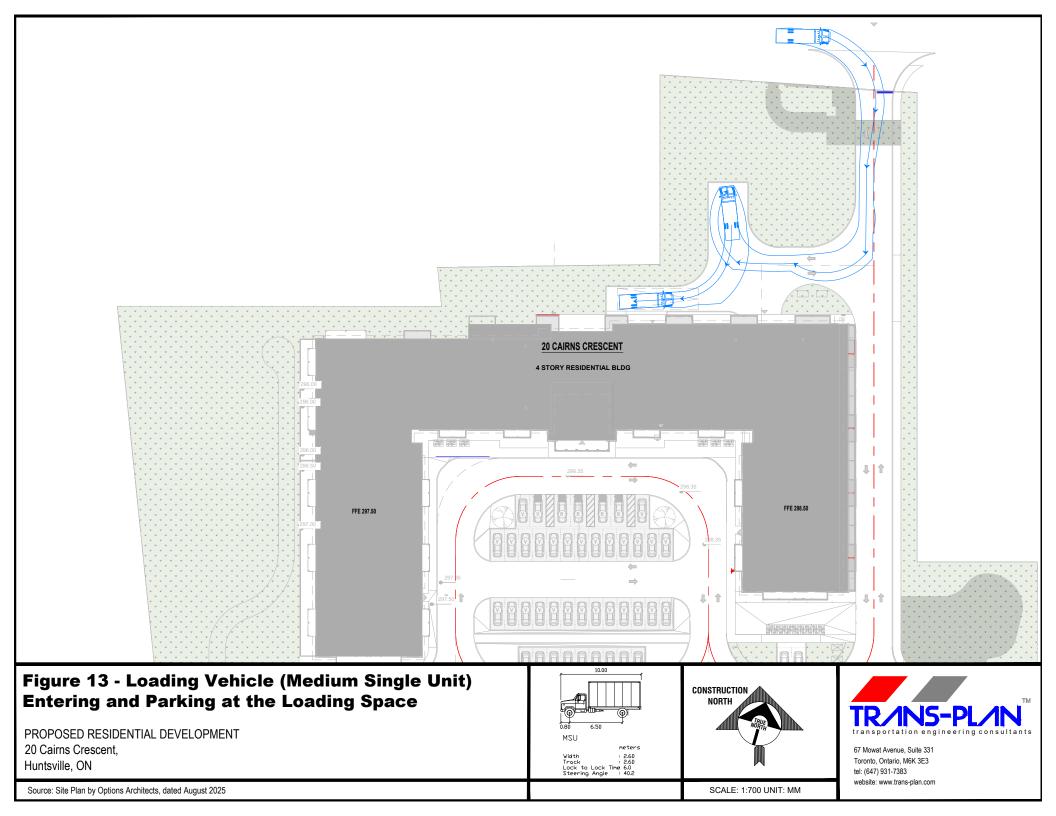


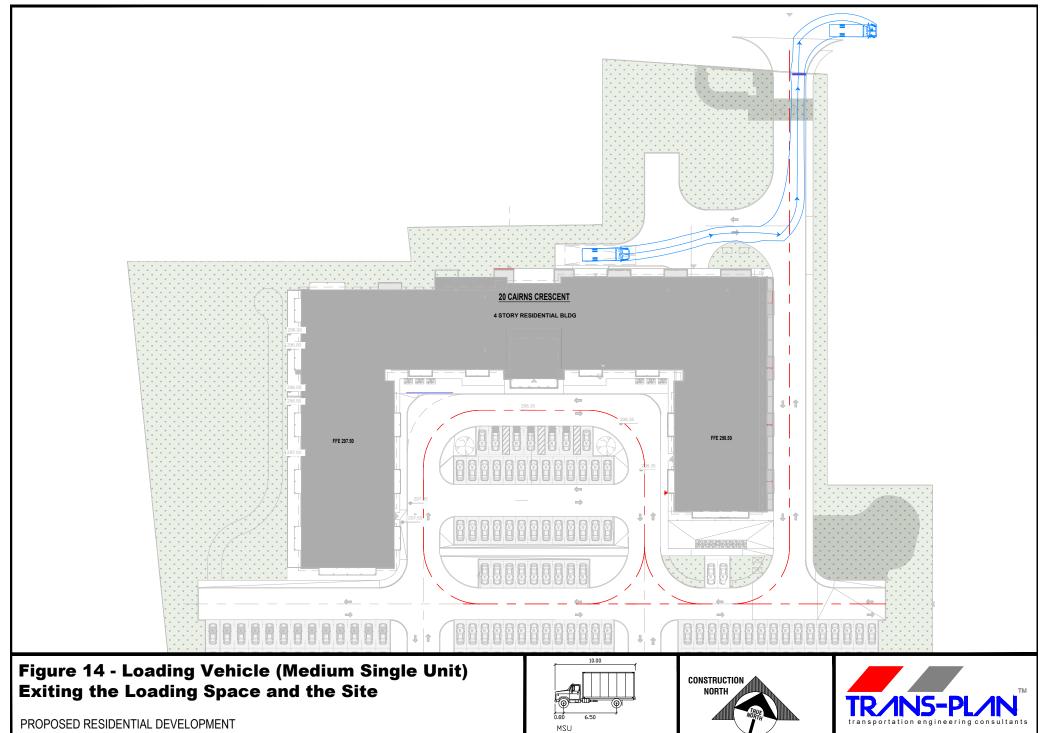


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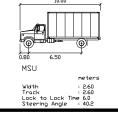


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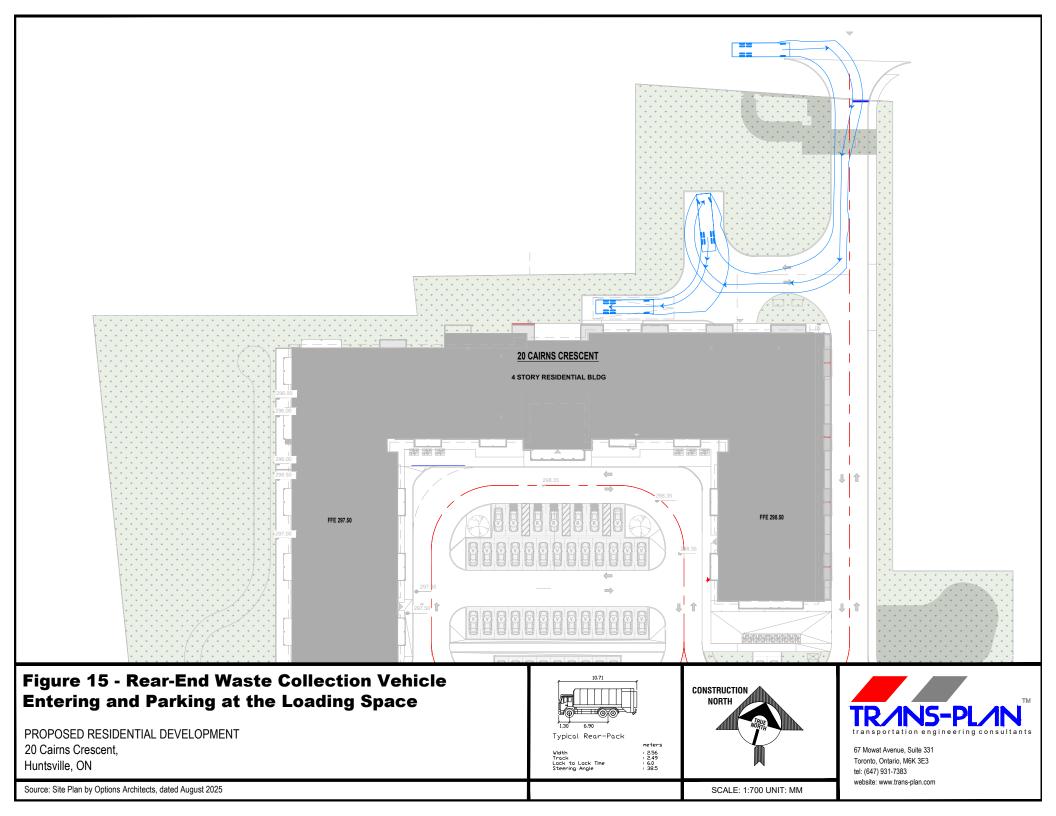
20 Cairns Crescent, Huntsville, ON

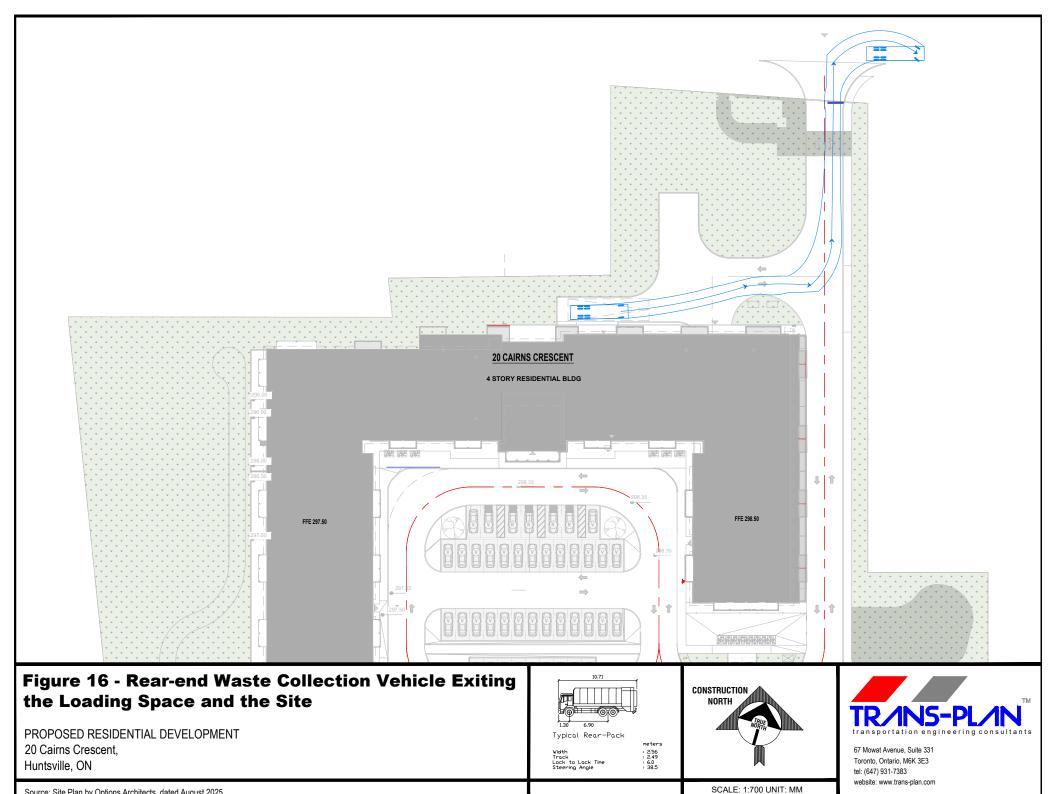


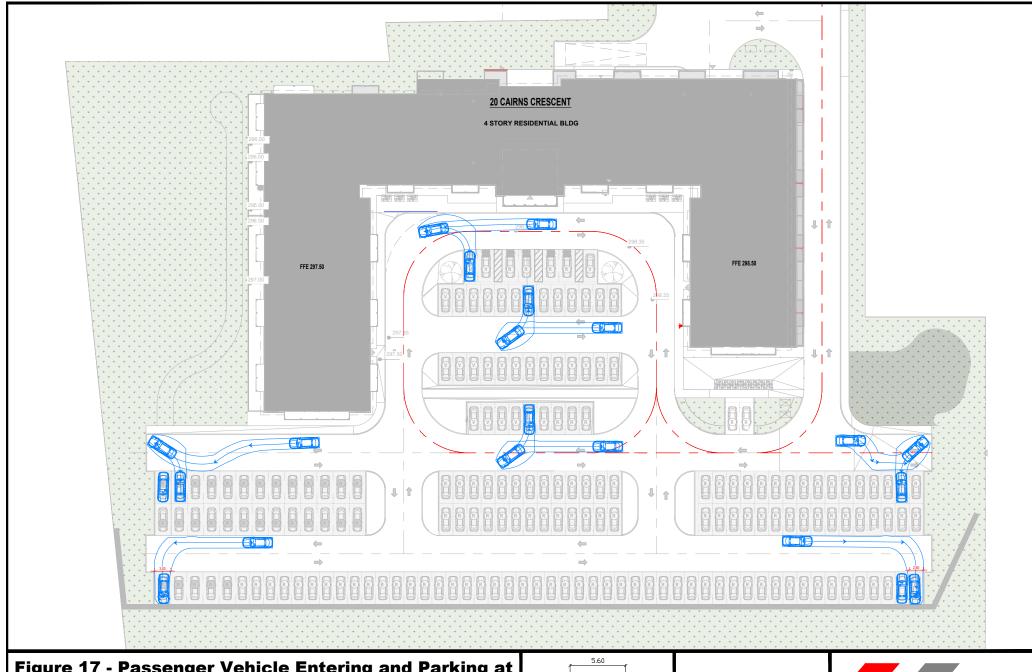


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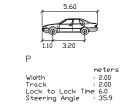






# Figure 17 - Passenger Vehicle Entering and Parking at the Critical Space (Ground Floor)

PROPOSED RESIDENTIAL DEVELOPMENT 20 Cairns Crescent, Huntsville, ON



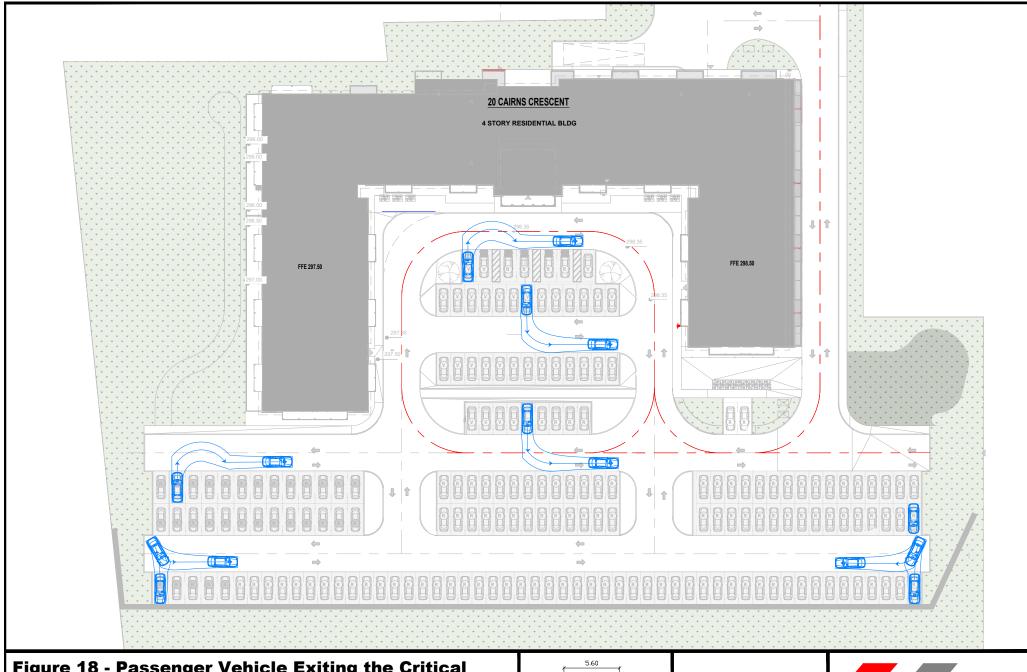




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Source: Site Plan by Options Architects, dated August 2025

SCALE: 1:1000 UNIT: MM



# Figure 18 - Passenger Vehicle Exiting the Critical Parking Spaces (Ground Floor)

PROPOSED RESIDENTIAL DEVELOPMENT 20 Cairns Crescent, Huntsville, ON

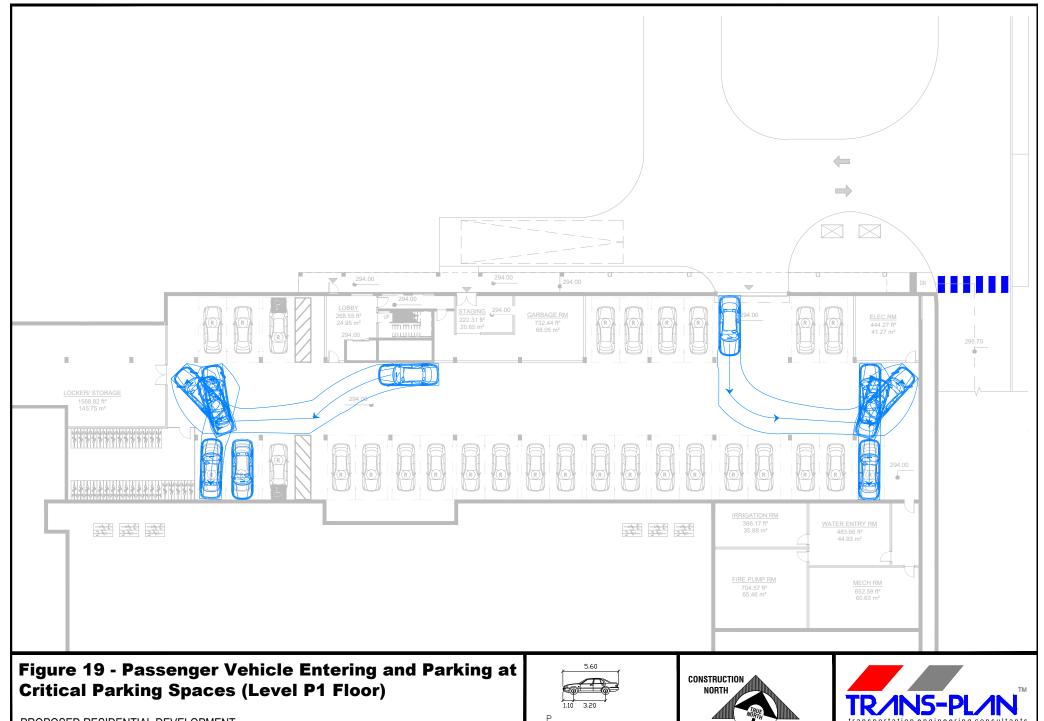




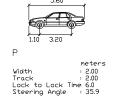
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PROPOSED RESIDENTIAL DEVELOPMENT 20 Cairns Crescent, Huntsville, ON

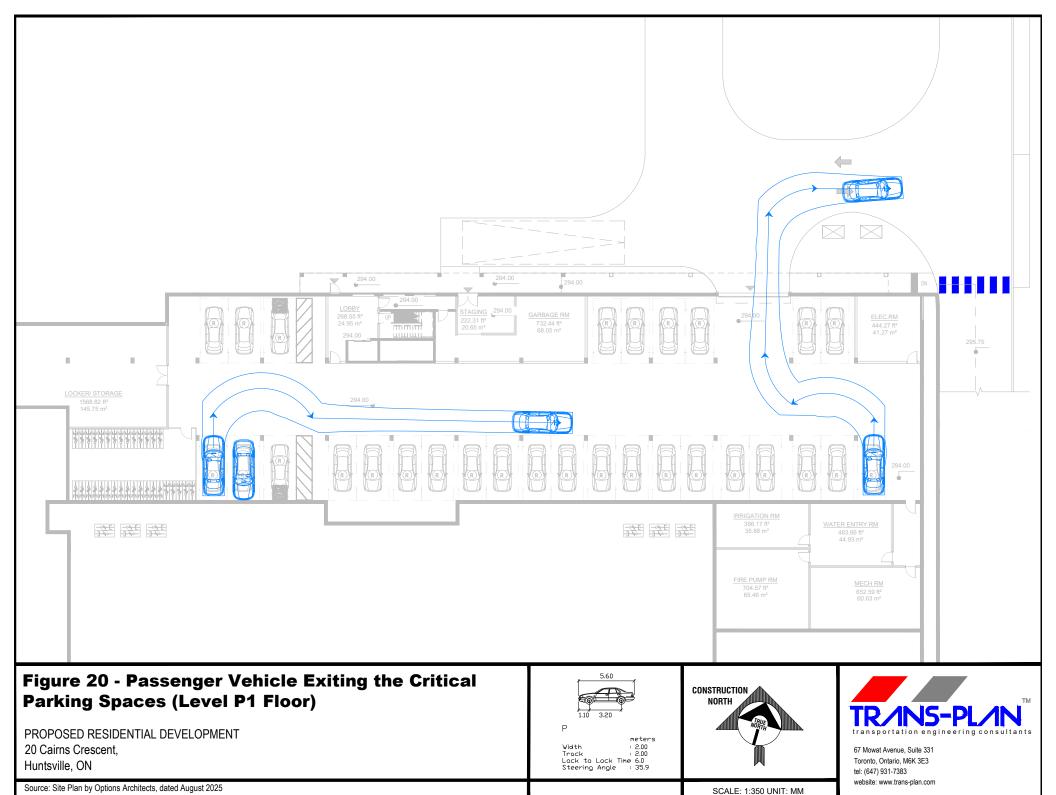




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## 12. SIGHTLINE ANALYSIS

## 12.1 Methodology

Sightline conditions at the proposed access on Cairns Crescent in Huntsville were reviewed to assess vehicle safety during driveway egress. The proposed access is located on a two-lane local road with a posted speed limit of 50 km/h. A design speed of 60 km/h was used in accordance with the Transportation Association of Canada (TAC) Guidelines (2017), which establishes the required minimum stopping sight distances (SSD) for each site access, as tabulated in Table 13.

Table 13 – Required Sight Distances as per TAC 2017

Site Access Location	Posted Speed Limit	Design Speed	Movement	Stopping Sight Distance	Intersection Sight Distance
Cairns Crescent	50 kph	60 kph	Right turn	85 m	110
	SO KPII	OU KPII	Left turn 85 m		130

Sight distance was measured from a 4.5 m setback from the road edge, using a driver eye height of 1.08 m and an object height of 0.6 m. Photos were taken from the driver's viewpoint to verify visual conditions.

## 12.2 Field Measurements

Based on Trans-Plan's measurements taken on July 11, 2025, the sight distances shown in Table 14 and Table 15 are available from the proposed driveway location, based on a driver's eye height of 1.08m and an object height of 0.6m (as specified by Chapter 2 of TAC 2017). The measurements are taken from 4.5m back from the edge of the road of the proposed access.

Table 14 – Available Sight Distance vs Required Stopping Sight Distance

Site Access Location	Movement	Available Sight Distance	Required Stopping Sight Distance	Requirement Met?
Cairns Crescent	Right turn	290 m	85 m	Υ
	Left turn	50 m	<b>65</b>	N

As shown in Table 14, the right-turn movement at Cairns Crescent meets the required stopping sight distance. Cairns Crescent offers a right-turn sight distance of 290 m, which significantly exceeds the required 85 m. However, the left-turn movement does not meet the required SSD. The available left-turn sight distance is only 50 m, falling short of the required value.



Table 15 – Available Sight Distance vs Intersection Sight Distance

Site Access Location Movement		Available Sight Distance	Required Intersection Sight Distance	Requirement Met? (Y/N)
Cairns Crescent	Right turn	290 m	110	Y
	Left turn	50 m	130	N

Table 15 shows that only the right-turn movement at Cairns Crescent meets the intersection sight distance requirement, with 290 m available compared to the required 110 m. The left turn movement falls short of its respective ISD criteria. The left-turn movement at Cairns Crescent has an available sight distance of 50 m, well below the 130 m required.

## 12.3 Sightline Analysis Summary

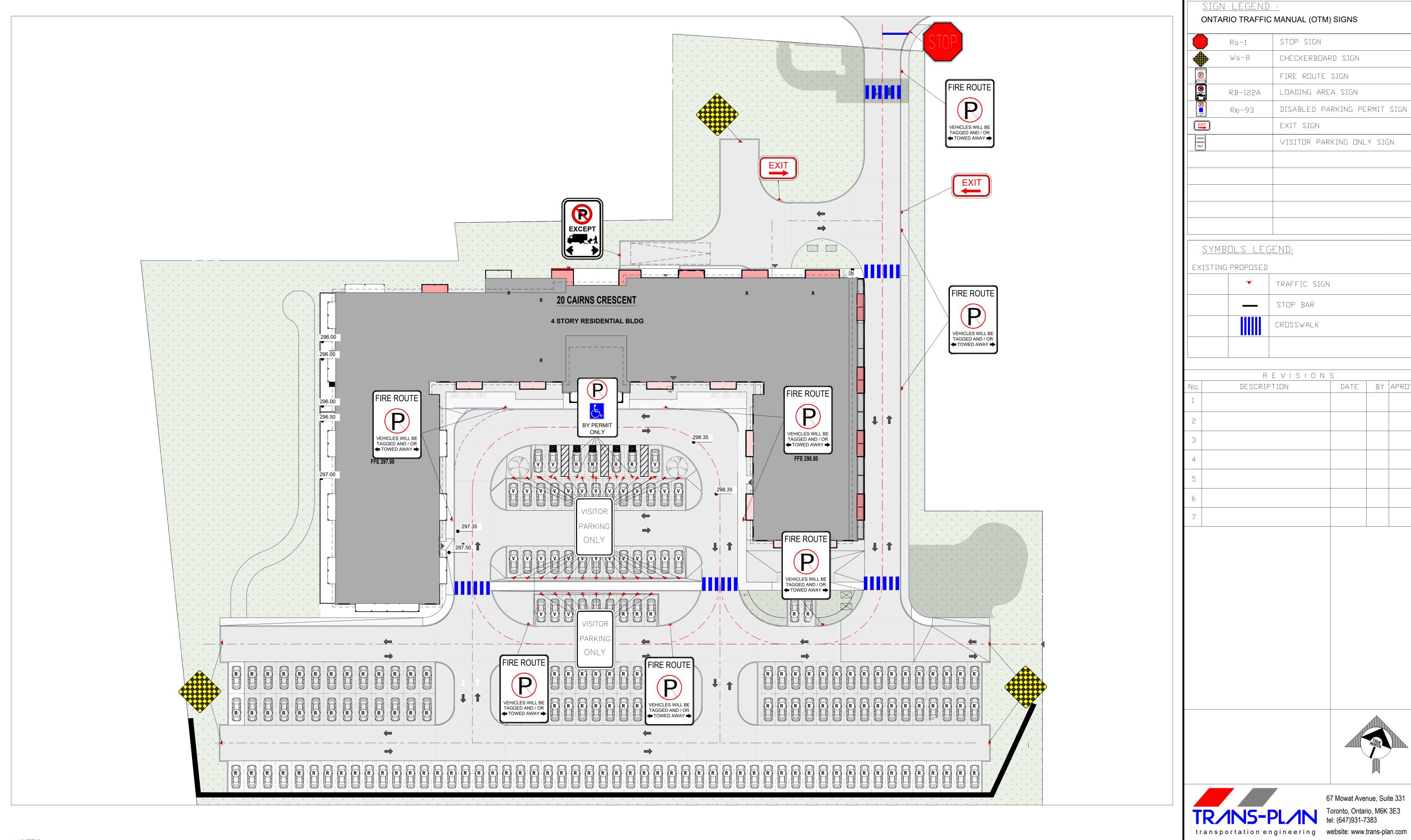
The access proposed on Cairns Crescent meets or is functionally acceptable for SSD in both directions, provided that weeds are cleared. No further mitigation is required at this location.

## 13. TRAFFIC SIGNAGE AND PAVEMENT MARKING PLAN

A transportation management implementation plan (showing traffic signage and pavement markings for the site) is provided in Figure 21. The plan includes signage and pavement markings for fire routes, pedestrian crosswalks, and parking areas. Based on the sign types and general placements shown in the Ontario Traffic Manual, the proposed Transportation Management Implementation Plan consists of the following traffic signage placement:

- One (1) Stop Sign is located at the entrance for traffic entering the development. The stop sign is accompanied by a stop bar pavement marking to guide vehicles on where to stop.
- Ten (10) Fire Route Signs are positioned along the internal roadways of the site to prevent vehicles from stopping at all times, ensuring safety and ease of access during emergencies.
- One (1) Loading Space Sign is placed at the designated loading area to guide loading vehicles and prevent unauthorized vehicles from using the space.
- Seven (7) Disabled Parking Permit Signs are installed at accessible parking spaces to prevent unauthorized vehicles from parking there and to inform users of the designated locations.
- Seven (7) Checkerboard Signs are installed at abrupt dead-ends to alert motorists and enhance safety within the site.
- Two (2) Exit Signs are positioned at ground level, facing the egressing vehicles from the basement parking, and one facing the turning traffic to guide and prevent wrong turns into the loading area, which is located immediately to the left.

The Signage Plan is also provided separately as a full-sized (24" x 36") drawing, 1:300 scale, for submission to the Town.



## NOTES:

- 1. ALL SIGNAGE AND PAVEMENT MARKINGS SHALL BE INSTALLED IN ACCORDANCE WITH THE ONTARIO TRAFFIC MANUAL (OTM) BOOK 5 (REGULATORY SIGNS), BOOK 11 (PAVEMENT, HAZARD AND DELINEATION MARKINGS), AND BOOK 15 (PEDESTRIAN CROSS FACILITIES), WHERE APPLICABLE
- 2. UNDERLAY IS BASED ON THE SITE PLAN BY OPTIONS ARCHITECTS DATED AUGUST 01, 2025
- 3. ALL UNITS ARE IN METRES

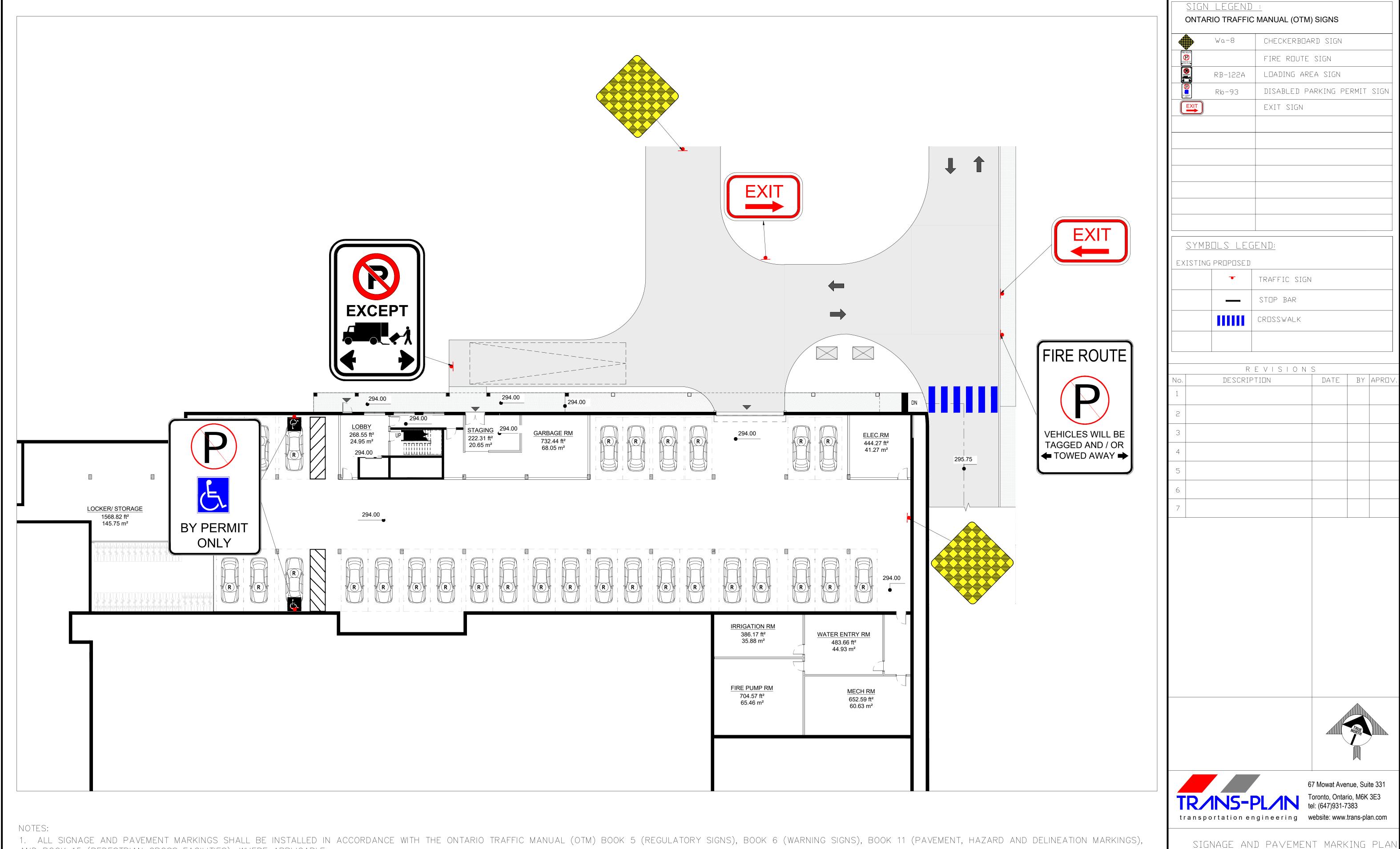
67 Mowat Avenue, Suite 331

DATE BY APRON

SIGNAGE AND PAVEMENT MARKING PLAN

PROPOSED RESIDENTIAL DEVELOPMENT 20 Cairns Crescent, Hunstville ON

B.C. **CHECKED BY:** M.B. PROJECT No.:25P22021E B.C. **CHECKED BY**: M.B. SCALE: 1:300 (PAPER SIZE 24×36) DATE: AUGUST, 2025



- AND BOOK 15 (PEDESTRIAN CROSS FACILITIES), WHERE APPLICABLE
- 2. UNDERLAY ÌS BASED ON THE SITE PLAN BY OPTIONS ARCHITECTS DATED AUGUST 01, 2025
- 3. ALL UNITS ARE IN METRES

PROPOSED RESIDENTIAL DEVELOPMENT 20 Cairns Crescent, Hunstville ON

DESIGN BY:	B.C.	СН	ECKED BY	: M.B.		PROJ	ECT No.:2	5P22	021B1
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## 14. CONCLUSIONS

This Transportation Study report for the proposed residential development located at 20 Cairns Crescent in the Town of Huntsville is summarized as follows:

## **Proposed Development**

- The proposed development consists of a 4-storey residential building with 176 dwelling units, an indoor amenity area of 262 m², and an outdoor amenity area of 479.38 m², for a total GFA of 12,467.37 m².
- A total of 211 parking spaces (176 residential and 35 visitors, including accessible spaces) will be
  provided within surface and underground garage levels. Vehicular access will be via one full-moves
  access on Cairns Crescent. A loading space will be located on the north side of the building.

## **Traffic Impact Study**

- Traffic counts were conducted by Trans-Plan in August 2023 for the study intersections, with an additional intersection count completed in July 2025 in response to comments. All counts were taken on a weekday during the morning and afternoon peak periods.
- A conservative background growth rate of 2% per year (compounded annually) was applied to the
  existing traffic volumes in the model. This rate was used to project traffic conditions for the buildout year (2028) as well as for 5 years (2033) and 10 years (2038) after build-out.
- Trips for the proposed development were generated using trip rates from the ITE Trip Generation manuals, 11<sup>th</sup> Edition. The subject site is expected to generate approximately 66 and 69 new two-way trips in the weekday AM and PM, respectively.
- At the Cairns Drive & Main Street West intersection, the northbound left and southbound through/left/right movements are expected to drop to LOS F in the future due to traffic increases from growth and new developments, resulting in major delays.
- Most study intersections are expected to continue operating at acceptable levels under future traffic
  conditions; however, localized capacity issues are anticipated at the Highway 11 ramps and Cairns
  Drive/Main Street West by 2033–2038, primarily affecting northbound and southbound movements.

## **Parking Study**

- The proposed development provides 211 parking spaces, resulting in a shortfall of 1 space (0.5% deficiency) compared to the Town of Huntsville's Community Planning Permit By-law Amendment, which requires 212 spaces for a 176-unit residential apartment.
- Parking demand surveys at comparable residential buildings within Huntsville found an average peak demand rate of 0.78 spaces per unit, substantially below Huntsville's by-law rate.
- Applying the observed demand rate to the proposed development suggests a peak requirement of 137 spaces—74 spaces fewer than the proposed supply—indicating that the planned parking is adequate despite the deficiency relative to the Town's by-law.



## Site Plan Review

- A geometric design review confirmed that the proposed site accesses exceed the District of Muskoka's standards for width, corner radii, shoulder width, and landscape buffer, enhancing maneuverability, safety, and efficiency.
- AutoTurn analysis verified that fire trucks, loading vehicles, waste collection vehicles, and passenger vehicles can safely enter, navigate, and exit the site. Designated loading and waste collection areas are accessible without any operational constraints.
- At Cairns Crescent, right-turn sight distances meet TAC 2017 requirements, but left-turn intersection sight distances fall short, warranting vegetation trimming or removal to improve left-turn visibility and safety.

Overall, the traffic impact and parking studies indicate that the proposed development can be accommodated within the existing road network, with most intersections operating at acceptable levels despite localized capacity challenges anticipated by 2033–2038 at the Highway 11 ramps and Cairns Drive/Main Street West; the proposed parking supply is supported by demand analysis despite a by-law shortfall, and the site plan review confirms that access and circulation meet or exceed applicable standards, with minor sightline improvements recommended at Cairns Crescent to enhance safety should it be used in the future.

Respectfully submitted,

Anil Seegobin, P.Eng.

Partner, Engineer

Trans-Plan Transportation Inc.

**Transportation Consultants** 



## **APPENDICES**

Appendix A – TIS submission July 2024

Appendix B – Peer Review Comments

Appendix C - Correspondence with Town of Huntsville

Appendix D – Turning Movement Counts

Appendix E – Capacity Analysis Results

Appendix F - Level of Service Definitions

Appendix G – Town of Huntsville Community Planning Permit By-Law CPPA/20/2025/HTE, Excerpts

Appendix H - Parking Demand Survey Results at Proxy Sites

Appendix I – District of Muskoka Access Design Criteria, Excerpts

Appendix J – Sightline Survey Results



## **APPENDIX A**

Traffic Impact Study July 2024







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July 26, 2024

1000120857 Ontario Inc 110 MathesonBlvd W, Suite 120 Missisauga ON L5R 4G7

c/o Mr. Adam Dhalla The Biglieri Group

#### Re: Proposed Residential Development, 20 Cairns Crescent, Huntsville, ON - Transportation Study

Dear Mr. Chatwal,

TRANS-PLAN has prepared this Transportation Study in support of the proposed residential development, located at 20 Cairns Crescent in the Town of Huntsville, Muskoka Region. The proposed development includes a 4-storey residential building consisting of 184 residential units and one parking level consisting of 231 parking spaces. Vehicular access is provided by 2 proposed accesses: 1 full-moves access on Cairns Crescent and 1 full-moves access on Kitchen Road South.

Our traffic impact study findings indicate that the proposed development could be accommodated on the existing road network without any required road/intersection improvements in the study area.

Our parking study justifies the proposed reduced parking supply. A site circulation review has also been provided.

Sincerely,

Anil Seegobin, P.Eng. Partner, Engineer

Trans-Plan Transportation Inc.
Transportation Consultants

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Ahmed Kassim, EIT Traffic Assistant

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#### 1. INTRODUCTION

Trans-Plan has been retained by 1000120857 Ontario Inc. to complete a Transportation Study report for the proposed residential development, located at 20 Cairns Crescent in the Town of Huntsville, Muskoka Region, Ontario. This report includes the following study components and scope of work:

#### Traffic Impact Study

- A review and assessment of the existing road network
- An assessment of boundary road operations under future background conditions, including a review
  of traffic growth, area developments and propose transportation improvements in the study area
- An assessment of the impact of site-generated traffic on the study area intersections under future conditions
- Recommendations to mitigate any identified traffic impacts at the boundary roadways and intersections, resulting from the proposed development

#### Parking Review

- Review of the site parking requirements for the proposed land use based on the Town of Huntsville Zoning By-law in comparison to the parking supply on-site
- Compare the Town's residential use by-law parking rates with other similar municipalities parking rates
- Conducting parking utilization surveys of residential building developments (proxy sites) located in the surrounding study area
- An estimation of future parking demands, based on surveys of the proxy site, applying surveyed rates

#### Site Plan Review

A review of vehicle circulation for waste collection vehicles, fire trucks, loading vehicles and passenger

A term of reference was sent out to both the Town and MTO to discuss the scope of work for the project but there was no response received. This report adheres to the Ministry of Transportation Ontario General Guidelines for the Preparation of Traffic Impact Studies, dated March 2023.

#### 2. SITE LOCATION

The subject site lies within the jurisdiction of the Ministry of Transportation Ontario's (MTO) Permit Control Area, situated to the east of Highway 11. More precisely, the development site is positioned just south of the intersection of Main Street West and Cairns Drive in the Town of Huntsville, within the Muskoka Region (See Figure 1).

Currently, the site is vacant with mainly vegetation. Surrounding land uses in the vicinity include residential properties to the east along Kitchen Road South, commercial establishments to the north and west, and a large expanse of undeveloped green space to the south. The Highway 11 interchange is located just north of the subject site, which generally travels in a north-south direction, connecting to



locations such as North Bay and Barrie.

#### 3. PROPOSED DEVELOPMENT

The site plan, prepared by Options Architects, is shown in Figure 2. The proposed development consists of a 4-storey residential building featuring 184 dwelling units, an indoor amenity with a GFA of 264 m², and an outdoor amenity with a GFA of 424 m². The total GFA of the 4-storey residential building is 12,771 m². Surface and indoor garage parking level will provide a total of 231 parking spaces including accessible spaces (184 residential spaces and 47 visitor spaces). Vehicular access is provided by 2 proposed accesses: 1 full-moves access on Cairns Crescent and 1 full-moves access on Kitchen Road South. A loading space is located on the north side of the building.

#### 4. EXISTING CONDITIONS

#### 4.1 Road Network

The major roadways located in the study area are described as follows:

**Highway 11** is a north-south freeway under the jurisdiction of the MTO. Ramp connections are provided along Main Street W/Aspdin Road to enter and exit the highway. Off-ramp connections are stop-sign controlled, with advisory speed signs of 40km/h. On-ramp connections are channelized turns with advisory speed signs of 40km/h.

Main Street West is classified as a collector road under the jurisdiction of the Town of Huntsville. The roadway runs in a east-west direction and terminates at Highway 11. It consists of two travel lanes, one in each direction with a centre left turn lane. Main Street West has a posted speed limit of 60 km/h.

Aspdin Road is classified as a collector road under the jurisdiction of the Town of Huntsville. The roadway runs in a east-west direction and is a continuation of Main Street West just west of the Highway 11 Northbound on/off ramp. It consists of two travel lanes, one in each direction. Aspdin Road has a posted speed limit of 60 km/h.

**Cairns Crescent** is a local road under the jurisdiction of the Town of Huntsville. Cairns Crescent runs in an east-west direction starting from Kitchen Road South and terminates in a cul-de-sac at the Good Food Coop. It consists of two travel lanes, one in each direction. It has an assumed speed limit of 50 km/h.

**Cairns Drive** is a local road under the jurisdiction of the Town of Huntsville. Cairns Drive runs in an north-south direction starting from Cairns Crescent and terminating at the intersection of Main Street West. It consists of two travel lanes, one in each direction. It has an assumed speed limit of 50 km/h.

**Kitchen Road South** is a local road under the jurisdiction of the Town of Huntsville. Kitchen Road South runs in an north-south direction starting from Main Street West and terminating in a cul-de-sac in a residential neighbourhood. It consists of two travel lanes, one in each direction. It has an assumed speed limit of 50 km/h.

Figure 3 shows schematically, the existing roadway characteristics within the study area.

#### 4.2 Traffic Counts

Turning movement counts (TMC) were conducted by Trans-Plan, as summarized in Table 1, since recent TMC data was unavailable from MTO and the town. Figure 4 show the balanced volumes for the weekday



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AM and PM peak hours, where the highest counted intersection volumes were used to be conservative and were balanced across the entire network. The raw count data is provided in Appendix A.

Table 1 - Current Intersection Turning Movement Counts

Intersection	Count Date	Peak Hours		
Intersection	Count Date	AM	PM	
Aspdin Road & Highway 11 Northbound Ramp		7:45 – 8:45	16:00 – 17:00	
Aspdin Road & Highway 11 Southbound Ramp		7:45 – 8:45	16:00 – 17:00	
Main Street West & Cairns Drive	Friday August 25, 2023	7:45 – 8:45	16:00 – 17:00	
Cairns Crescent & Cairns Drive		7:45 – 8:45	16:15 – 17:15	
Cairns Crescent & Kitchen Road South		7:45 – 8:45	17:00 – 18:00	

#### 5. FUTURE BACKGROUND CONDITIONS

Future background traffic volumes were determined based on a review of other area developments and background traffic corridor growth. Planned roadway improvements are also reviewed in this section.

#### 5.1 Horizon Years

The estimated build-out year for the proposed development is 2026. The future traffic analysis was conducted at estimated build-out (2026), and a ten-year (2036) planning horizon after full build-out.

#### 5.2 Background Growth Rate

A conservative two percent growth rate per annum has been applied to all study area roadway volumes for the horizon years. The conservative growth rate accounts for any potential development in the surrounding areas.

#### 5.3 Background Developments

Based on the District of Muskoka Development Applications map, there are currently no other planned developments in the surrounding area.

#### 5.4 Planned Roadway and Transit Improvements

There are no planned roadway or transit improvements within the study area, based on a review of the Town of Huntsville Official Plan and the Road Needs Study 2015, completed by C.C. Tatham & Associates Ltd., for the Town of Huntsville.

Based on the review of future background conditions, future background traffic volumes for the horizon year 2036 for weekday AM and PM peak hours can be seen in Figure 5.



#### 6. SITE TRAFFIC

#### 6.1 Trip Generation

Site trips for the proposed development were generated using the Institute of Transportation Engineers (ITE) Trip Generation manuals, 11<sup>th</sup> Edition. The ITE Land Use Codes (LUC) 221 for Multifamily Housing (Mid-Rise) were utilized. The site trip generation is shown in Table 2.

Table 2 - Trip Generation, Proposed Residential Development

Land Use	Size		AM Peak Hour		PM Peak Hour			
			In	Out	Total	In	Out	Total
Multifamily Housing	184	Distribution	23%	77%	100%	61%	39%	100%
(Mid-rise) LUC 221	(Units)	Equation	T=	0.71(X)+	4.80	T=	0.39(X)+	0.34
		Rate	0.09	0.28	0.37	0.24	0.15	0.39
		Trips	16	53	69	44	28	72

The proposed development is expected to generate approximately 69 and 72 new two-way trips in the weekday AM and PM peak hours, respectively.

#### 6.2 Trip Distribution and Assignment

Site trips were distributed and assigned to / from the site and the boundary roadways within the study area according to the existing traffic patterns and location of key areas within the study boundaries.

The majority of trips are expected to travel north towards Main Street West along Cairns Drive and Kitchen Road South, as the roadway transitions into Aspdin Road and connects to the nearby Highway 11 interchange, and the Town of Huntsville. The site traffic assignment for the weekday AM and PM peak hours are provided in Figure 6.

#### 7. FUTURE TOTAL TRAFFIC CONDITIONS

The site traffic volumes were summed with the future background traffic volumes to obtain the future total traffic volumes. The future total traffic volumes for the horizon year 2036, during the weekday AM and PM peak hours, are shown in Figure 7.

#### 8. CAPACITY AND VEHICLE QUEUING ANALYSIS

#### 8.1 Capacity Analysis

A capacity analysis was performed for the study area intersections and site driveways using Synchro 11 analysis software. The capacity analysis output sheets and level of service (LOS) definitions are provided in Appendix B and Appendix C, respectively. The results for existing conditions and the 2036 horizon year is shown in Table 3.

The MTO TIS Guidelines, dated March 2023, states that "For ramps, a v/c ratio for terminal ramp approaches with a value greater than 0.75 would be deemed critical and shall be evaluated for possible operational improvements." For intersections not within the jurisdiction of MTO, a level-of-service (LOS)



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of D or better, or a volume-to-capacity (v/c) ratio of 0.85 or better is generally acceptable for individual movements and the overall intersection. The critical overall intersections and/or individual movements are highlighted in the analysis and operational improvements have been recommended, as needed.

The capacity analysis results are summarized as follows:

#### Highway 11 Southbound Off-Ramp & Aspin Road

#### **Existing Traffic Conditions**

Under existing traffic conditions, the overall intersection operates acceptably with an LOS of C or better during the weekday AM and PM peak hours. All individual movements are operating acceptably with minor delays of up to 16 seconds.

#### Future 2036 Traffic Conditions

Under future 2036 traffic conditions, the overall intersection is expected to continue operating acceptably with an LOS of D during the weekday AM and PM peak hours. All individual movements are expected to operate acceptably with minor delays of up to 28 seconds.

#### Highway 11 Northbound Off-Ramp & Aspin Road

#### **Existing Traffic Conditions**

Under existing traffic conditions, the overall intersectioKn operates acceptably with a good LOS of B or better during the weekday AM and PM peak hours. All individual movements are operating acceptably with minor delays of up to 14 seconds.

#### Future 2036 Traffic Conditions

Under future 2036 traffic conditions, the overall intersection is expected to continue operating acceptably with a good LOS of C during the weekday AM and PM peak hours. All individual movements are expected to operate acceptably with minor delays of up to 15 seconds.

#### Cairns Drive & Main Street West

#### **Existing Traffic Conditions**

Under existing traffic conditions, the overall intersection operates acceptably with a good LOS of B or better during the weekday AM and PM peak hours. All individual movements are operating acceptably with minor delays of up to 15 seconds.

## Future 2036 Traffic Conditions

Under future 2036 traffic conditions, the overall intersection is expected to continue operating acceptably with a good LOS of C during the weekday AM and PM peak hours. All individual movements are expected to operate acceptably with minor delays of up to 19 seconds.



#### **Cairns Crescent & Cairns Drive**

#### **Existing Traffic Conditions**

Under existing traffic conditions, the overall intersection operates acceptably with a good LOS of A during the weekday AM and PM peak hours. All individual movements are operating acceptably with minor delays of up to 9 seconds.

#### Future 2036 Traffic Conditions

Under future 2036 traffic conditions, the overall intersection is expected to continue operating acceptably with a good LOS of A during the weekday AM and PM peak hours. All individual movements are expected to operate acceptably with minor delays of up to 10 seconds.

#### Kitchen Road South & Cairns Crescent

#### **Existing Traffic Conditions**

Under existing traffic conditions, the overall intersection operates acceptably with a good LOS of A during the weekday AM and PM peak hours. All individual movements are operating acceptably with minor delays of up to 9 seconds.

#### Future 2036 Traffic Conditions

Under future 2036 traffic conditions, the overall intersection is expected to continue operating acceptably with a good LOS of A during the weekday AM and PM peak hours. All individual movements are expected to operate acceptably with minor delays of up to 9 seconds.

#### Site Access 1 & Cairns Crescent

#### **Future 2036 Traffic Conditions**

Under future 2036 traffic conditions, the overall intersection is expected to continue operating acceptably with a good LOS of A during the weekday AM and PM peak hours. All individual movements are expected to operate acceptably with minor delays of up to 9 seconds.

#### Site Access 2 & Kitchen Road South

#### **Future 2036 Traffic Conditions**

Under future 2036 traffic conditions, the overall intersection is expected to continue operating acceptably with a good LOS of A during the weekday AM and PM peak hours. All individual movements are expected to operate acceptably with minor delays of up to 9 seconds.



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#### PARKING STUDY

#### 9.1 Parking Requirements

The proposed parking supply is 231 spaces comprised of 184 residential spaces (1 space per unit) and 47 visitor spaces (0.26 spaces per unit).

The site parking requirement was reviewed based on the Town of Huntsville Community Planning Permit by-law 2022-97. The proposed site is subject to the parking requirements of the Urban Settlement Area of Huntsville. The by-law does not specifically breakdown the parking requirements of Dwelling Unit(multiple dwelling, apartment) into residential and visitor parking spaces. Although parking spaces is proposed to be designated for the site, for the purpose of this parking study and to be consistent with the by-law, the total parking supply will be utilized and compared with the parking requirement. Excerpts of the by-law are provided in Appendix D. A comparison of the parking requirements and the proposed parking supply is shown below in Table 4.

Table 4 - Parking Requirements, Town of Huntsville Zoning By-law

Llee	Size	Minimum Parking R	Provided	Deficiency		
Use	Size	Rate	Required Spaces	Spaces		
Residential	184	1.25 spaces per unit	267	231	-36	
	units	PLUS 1 space per 5 units	207	-		

Source: Community Planning Permit By-Law Number 2022-97

The proposed parking supply of 231 spaces is deficient of the minimum requirement by 36 spaces, which is about a minor 13 percent deficient. Typically, municipalities can accept a minor 10 percent deficiency without a need for a parking justification study. Although the deficiency is relatively low, a parking utilization survey was conducted at another multiple dwelling / apartment building within the Town to confirm typical parking demands of existing apartments in the area. In addition, a comparison of residential parking rates was compared to other similar townships.

#### 9.2 Review of Parking Requirements of Nearby Municipalities

As part of justification for a lower parking supply rate at the subject site, a review of the parking requirements as per the Zoning By-laws of similar municipalities are shown in Table 5. Source information is provided in Appendix E.

- Town of Gravenhurst Zoning By-law 2010-04 (dated February 2013)
- Town of Parry Sound Zoning By-law 2004-4653 (dated November 8, 2018)
- Town of Collingwood Zoning By-law 2010-04 (dated April 10, 2018)



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Table 5 - Comparison of By-law Parking Requirements

Municipality	Parking Rate (based on Residential Apartment use)	Parking Requirement (spaces)	Parking Surplus Compared to Subject Site (spaces)
Town of Gravenhurst	1 space per dwelling unit; plus 1 space for each 4 dwelling units for visitors <sup>(1)</sup>	230	+1
Town of Parry Sound	1.25 spaces per dwelling unit, 15% of which shall be dedicated as visitors parking <sup>(2)</sup>	230	+1
Town of Collingwood	1 space per unit, plus an additional 0.25 spaces per unit for visitor parking <sup>(3)</sup>	230	+1

Sources: (1) Gravenhurst Zoning By-law 2010-04, Section 6.1.3

(2) Town of Parry Sound Zoning By-law 2004-4653, Section 4.31

(3) Collingwood Zoning By-law 2010-04, Table 5.15.1.1

Based on a review of similar municipalities for parking requirements, the proposed parking supply of the subject site would be considered sufficient. The parking requirements of the Town of Huntsville are relatively conservative compared to other similar municipalities.

#### 9.3 Parking Surveys at Proxy Site

To better understand the parking demand rates generated by residential buildings, parking demand surveys were conducted at existing apartment building located nearby.

#### Proxy Site Selection

Trans-Plan completed a thorough review of an apartment building within the town and selected the following building for the purpose of conducting parking demand surveys. A residential development in the Town of Huntsville that is located within 5km to the subject site, was selected as a proxy site. The site statistics of the proxy development, in comparison to the subject site, are summarized in Table 6.

Table 6 - Proxy Site Statistics

Site	No. of Units	No. of Storeys	Parking Supply (spaces)
Subject Site: 20 Cairns Crescent	184	4	231
Laketree Residence at 210 Highway 60 (Proxy Site)	84	3	122

#### Survey Methodology for Proxy Site

A parking demand survey was conducted on a weekday and a Saturday: from Friday August 25<sup>th</sup> to Saturday August 26th. Parking surveys were conducted during peak periods (from 1pm to midnight), given that visitor parking demands tend to peak from 1pm to 7pm, and residents parking demands peak at midnight.



#### Survey Results at Proxy Site

The survey results, showing the peak parking demand (maximum number of vehicles occupying the parking areas) are summarized in Table 7. The detailed survey results are shown in tabular form in Appendix F.

Table 7 - Peak Parking Demand Survey Results

Proxy Site	LakeTree Residence, 210 Highway 60		
No. of Units	84		
Time of Peak Parking Demand	11:45pm (Friday)		
Peak Parking Demand (spaces)	95		
Peak Parking Demand Rate (spaces per unit)	1.13		

The results of the parking demand of the proxy residential yielded an average peak parking demand of 95 spaces. The average parking demand rate for residents was observed to be 1.13 spaces per unit, which is significantly lower than the parking requirements of the Town's Community Planning Permit by-law 2022-97.

#### 9.4 Estimated Parking Demands Based on Surveyed Rates

The parking demand rate observed from the proxy site was applied to the proposed site statistics to estimate future parking demands for the subject site, based on the survey parking rates, as shown in Table •

Table 8 – Estimated Parking Demands for the Subject Site

Subject Site Number of Units	Parking Supply	Peak Demands from Survey Results	Estimated Parking Demands for Subject Site	Surplus (spaces)
05	Spaces	Surveyed Rate	Spaces	+24
184	231	1.13 spaces per unit	208	

By applying the observed parking demand rate to the subject site, the expected peak parking demand rate for the proposed site would be approximately 1.13 spaces per unit. The demand of 208 spaces in total, could be met by the proposed parking supply of 231 spaces, which results a surplus of 24 spaces. Therefore, the parking requirement of the town is conservative when compared with similar municipalities, and the proxy site surveys completed at a similar apartment building within the town.

#### 10. SITE PLAN REVIEW

#### 10.1 Site Circulation Review

A site circulation review was conducted using AutoTurn vehicle turning template software to demonstrate that design vehicles could access their corresponding areas and egress from the site. The following design vehicles were selected for the site circulation review:



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- A typical front-load waste collection vehicle with a design length of 12m (represented as "Waste Collection")
- A typical fire truck with a design length of 8.4m (represented as "Fire Truck")
- A large loading vehicle based on a medium single-unit ("MSU") truck in the TAC 2017 guidelines (represented as "MSU")
- A large passenger vehicle based on a passenger vehicle ("P") in the TAC 2017 guidelines (represented as "P")

#### Waste Collection Vehicles

Figure 8 demonstrates a front-load waste collection vehicle entering the site from Cairns Cres. and navigating towards the designated waste collection area located on the north side of the building. Figure 9 illustrates a waste collection vehicle reversing from the designated waste collection area and exiting to Cairns Cres.

#### Fire Trucks

Figure 10 demonstrates a fire truck entering the site from Cairns Cres. and stopping at the front of the building. The fire truck continues to exit the site onto Kitchen Road South.

#### **Loading Vehicles**

Figure 11 demonstrates a loading vehicle entering the site from Cairns Cres. and navigating towards the designated loading space. Figure 12 shows a loading vehicle leaving the loading space and exiting to Cairns Cres.

#### Passenger Vehicles

Figure 13 show a passenger vehicle entering the parking level and parking into and exiting critical parking spaces.

#### 11. CONCLUSIONS

This Transportation Study report for the proposed residential development located at 20 Cairns Crescent in the Town of Huntsville, is summarized as follows:

#### Proposed Development

- A 4-storey residential building is proposed, consisting of 184 residential units an indoor amenity with a GFA of 264 sq.m and an outdoor amenity with a GFA of 264 sq.m and one parking level. The total GFA of the 4-story building is 12,771 sq.m.
- The proposed parking supply is 231 parking spaces (including 7 barrier-free spaces) provided on the surface. The surface parking lot consists of 147 residential parking spaces and 37 visitor spaces. The underground parking level consists of 37 residential spaces. Access to the site is to be provided via two proposed accesses: 1 full-moves access on Cairns Crescent and 1 full-moves access on Kitchen Boad South



#### Traffic Impact Study

- Traffic counts were conducted by Trans-Plan, dated August 2023. The counts were conducted by Trans-Plan on a weekday (morning and afternoon).
- A background growth rate of 2 percent per annum (compounded annually) was conservatively used.
   The growth rate was applied to our traffic model with existing volumes to determine operating conditions 10-years after build-out (2036).
- Trips for the proposed development were generated using trip rates from the ITE Trip Generation
  manuals, 11<sup>th</sup> Edition. The subject site is expected to generate approximately 69 and 72 new two-way
  trips in the weekday AM and PM respectively.
- The study area intersection is expected to continue operating acceptably under future traffic
  conditions. No operational improvements are required.

#### Parking Study

- The proposed parking supply of 231 spaces is deficient of the Town's Community Planning Permit bylaw 2022-97 by 36 spaces, which is a minimal 10 deficiency.
- The Town's parking rates were compared with the Town's of Gravenhurst, Parry Sound and
  Collingwood. The proposed parking supply of the subject site would be considered sufficient as per
  their by-law requirements at these municipalities. The Town's parking rates seem to be more
  conservative compared to these other municipalities.
- Proxy site surveys were completed at a similar apartment building within the town and a parking demand rate of 1.13 spaces per unit was observed.
- The proposed parking supply of 231 spaces is expected to be sufficient based on the add by law comparison of other municipalities and the proxy site survey data.

#### Site Plan Review

The results of the site circulation review indicate that waste collection vehicles, fire trucks, loading
vehicles and passenger vehicles can safely enter and exit the site via the site access and navigate to
its designated areas.

In summary, with respect to traffic considerations, the proposed development should be allowed to proceed, as it could be accommodated on the surrounding road network without any major roadway improvements. In addition, the parking supply is expected to be sufficient as per the parking study results.

Respectfully submitted,

Anil Seegobin, P.Eng. Partner, Engineer Ahmed Kassim Traffic Analyst

ahmed

Trans-Plan Transportation Inc.
Transportation Consultants

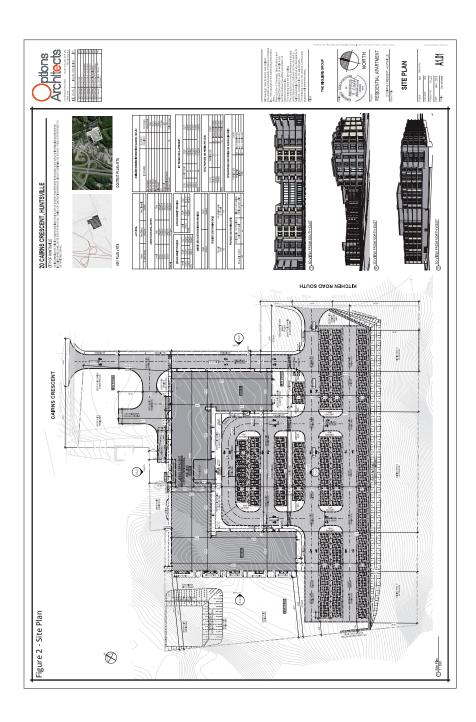


Transportation Study Proposed Residential Development 20 Cairns Crescent, Huntsville, ON

Figure 1 – Site Location



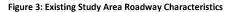
Source: Google Maps



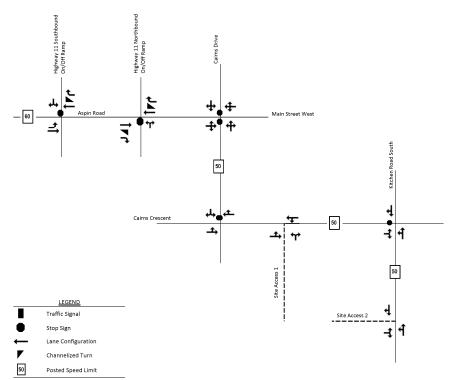
# TRANS-PLAN

#### TRANSPORTATION STUDY

Proposed Residential Development 20 Cairns Crescent, Huntsville, ON





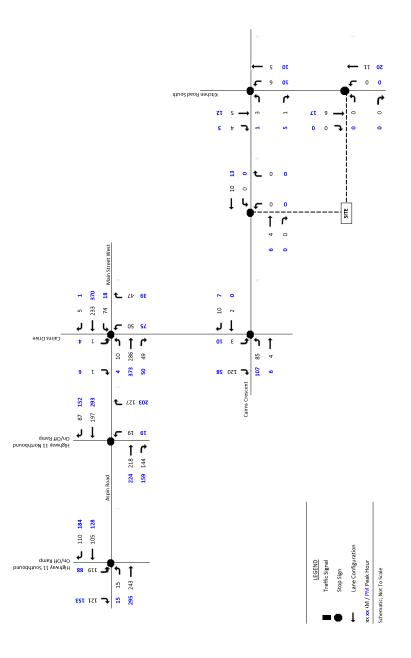


Schematic; Not To Scale



Figure 4: Existing Traffic Volumes, Weekday AM and PM Peak Hours







TRANSPORTATION STUDY
Proposed Residential Development
20 Cairns Crescent, Huntsville, ON



Figure 5: 2036 Background Traffic Volumes, Weekday AM and PM Peak Hours

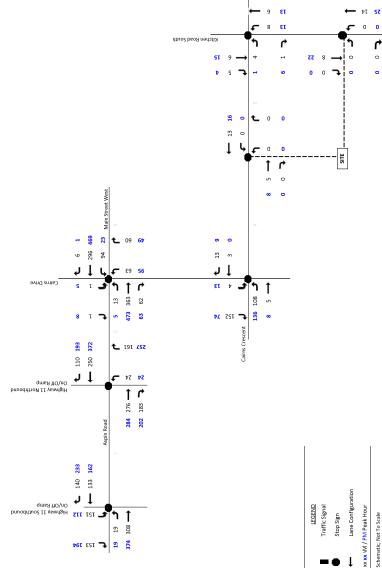
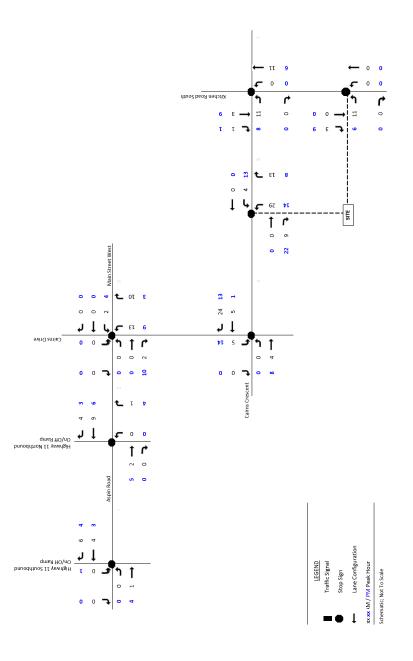




Figure 6: Site Traffic Assignment, Weekday AM and PM Peak Hours



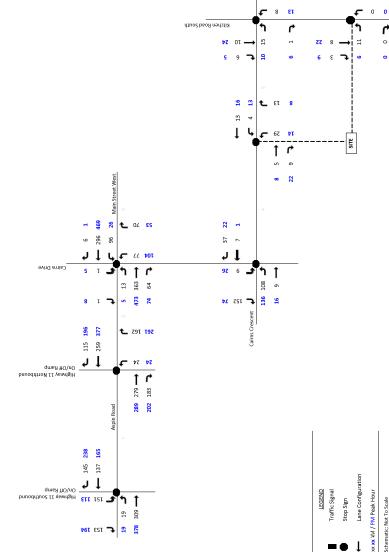


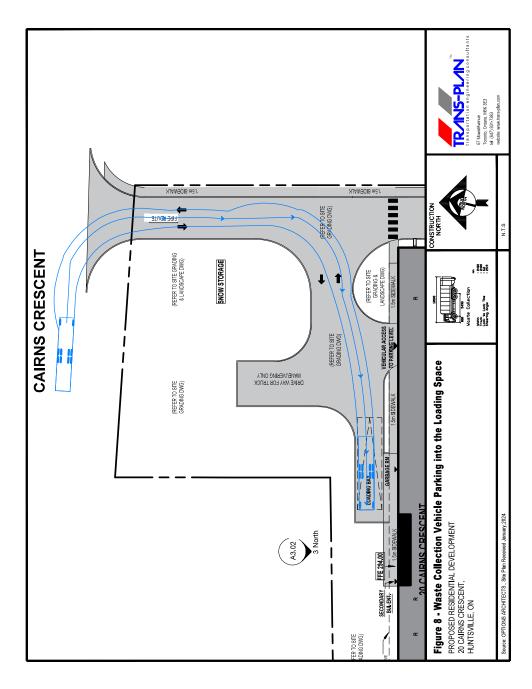


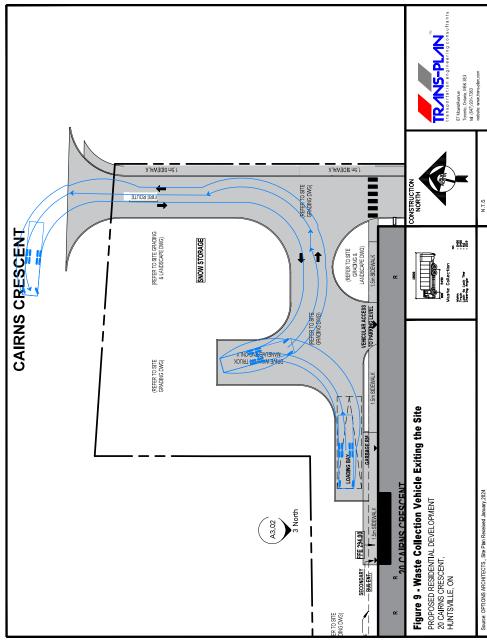
TRANSPORTATION STUDY
Proposed Residential Development
20 Caims Crescent, Huntsville, ON

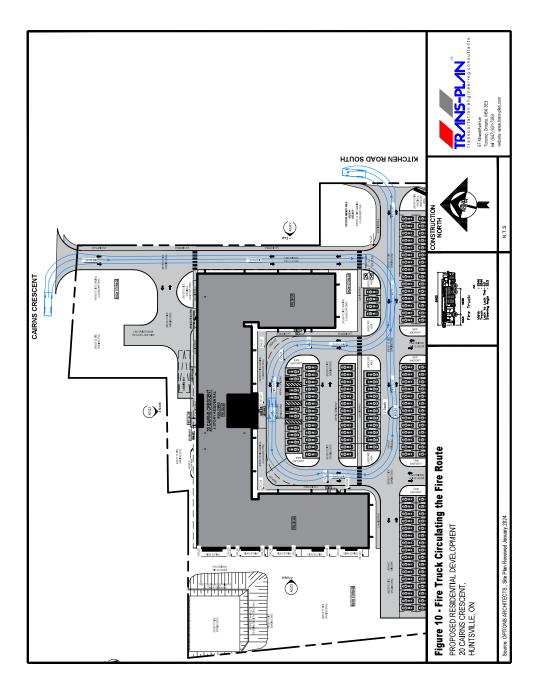


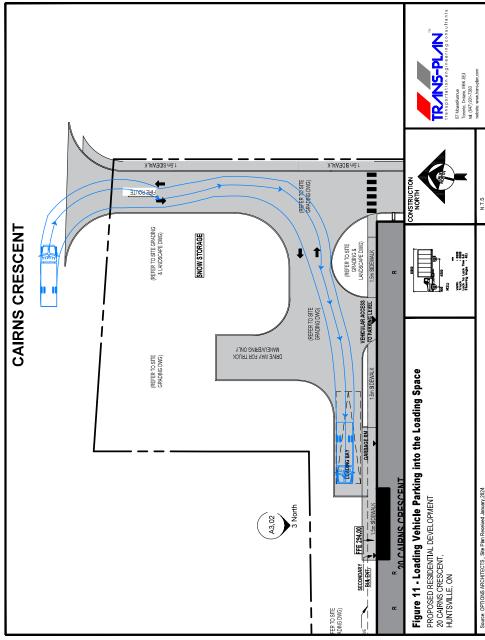
Figure 7: 2036 Total Traffic Volumes, Weekday AM and PM Peak Hours

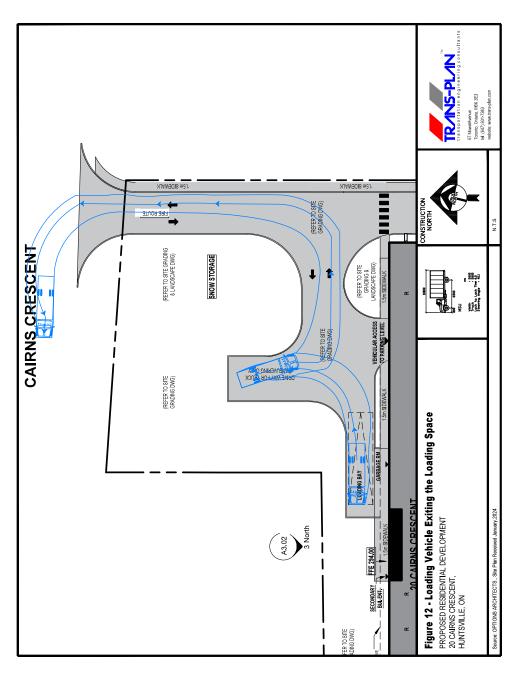


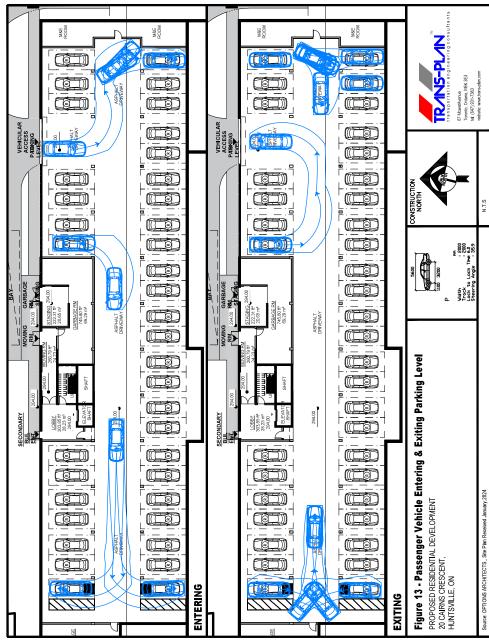














Transportation Study Proposed Residential Development 20 Cairns Crescent, Huntsville, ON

# **APPENDICES**

Appendix A – Turning Movement Counts

Appendix B – Capacity Analysis

Appendix C – Level of Service Definitions

Appendix D – Town of Huntsville Zoning By-law, Excerpts

Appendix E – Zoning By-laws of Comparable Municipalities, Excerpts

Appendix F – Proxy Site Survey Results



Trans-Plan Transportation Inc.
Ste ID Code:
Intersection Location:
Wurdipeath;
Wordingeath;
Weether and Temperature.
Surveyor

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## **Turning Movement Count Diagram**

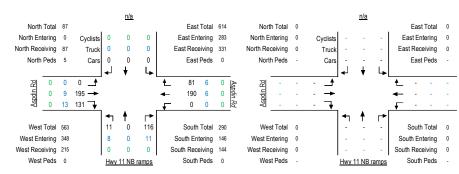
Intersection: Aspdin Road and Highway 11 Northbound Ramps

Municipality: Huntsville, Ontario

Intersection ID:

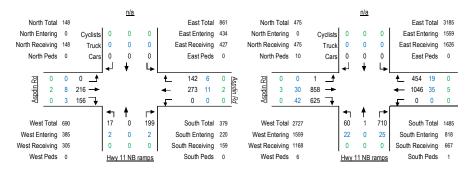
Date: Friday, August 25, 2023

#### AM Peak Hour: 7:45 to 8:45 MD Peak Hour: - to



#### PM Peak Hour: 16:00 to 17:00

# **Total 8-Hour Count**



Trans-Plan Transportation Inc.
Ste D'Code:
Intersection Location:
Workloads:
Weather and Temperature:
Surveyor:

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# **Turning Movement Count Diagram**

Intersection: Aspdin Road and Highway 11 Southbound Ramps Municipality: Huntsville, Ontario

Intersection ID:

Date: Friday, August 25, 2023

#### AM Peak Hour: 7:45 to 8:45 MD Peak Hour: - to -

				Hwy	11 SB r	amps										Hwy 1	I1 SB n	amps			
North Tot	al	361						East	Total	562		North	n Total	0					E	ast Tota	0
North Enterin	ng	236	Cyclists	0	0	0	Ea	ast Ent	tering	215		North Er	ntering	0	Cyclists	-	-	-	East	Entering	0
North Receiving	ng	125	Truck	9	0	2	Eas	t Rece	eiving	347		North Red	eiving	0	Truck	-	-	-	East F	Receiving	0
North Pe	ds	5	Cars	112	0	113		East	Peds	0		North	Peds	-	Cars	-	-	-	E	ast Peds	-
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				4	<b>†</b>	┍╸					_					◆7	<b>†</b>	>[			
West Tot	al	473		0	0	0		South	Total	0		Wes	t Total	0		-	-	-	So	uth Tota	0
West Enterin	ng	247		0	0	0	Sou	ıth Ent	tering	0		West Er	ntering	0		-	-	-	South	Entering	0
West Receiving	ng	226		0	0	0	Sout	h Rece	eiving	0		West Red	eiving	0		-	-	-	South F	Receiving	0
West Per	ds	0			n/a			South	Peds	0		Wes	t Peds	-	•		n/a		So	uth Peds	; -

# PM Peak Hour: 16:00 to 17:00

## **Total 8-Hour Count**

			Hwy 1	I1 SB ra	amps										Hwy 1	1 SB r	amps				
North Total	434						East	Total	685		Nort	h Total	1802						East	Total	2725
North Entering	241	Cyclists	0	0	0	Eas	st Ente	ering	305		North E	ntering	1054	Cyclists	0	0	0	Ea	ast En	tering	1169
North Receiving	193	Truck	4	0	3	East	Rece	iving	380		North Re	ceiving	748	Truck	34	0	11	Eas	t Rece	eiving	1556
North Peds	0	Cars	149	0	85		East F	Peds	0		Nort	h Peds	6	Cars	613	0	396		East	Peds	0
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West Total	587		0	0	0	S	outh <sup>-</sup>	Total	0		Wes	t Total	2407		0	0	0		South	Total	0
West Entering	307		0	0	0	Sout	h Ente	ering	0		West E	ntering	1244		0	0	0	Sou	ith Ent	tering	0
West Receiving	280		0	0	0	South	Rece	iving	0		West Re	ceiving	1163		0	0	0	South	h Rece	eiving	0
West Peds	0			n/a		S	outh f	Peds	0		Wes	t Peds	1			n/a			South	Peds	6

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Intersection: Cairns Crescent and Kitchen Road South Municipality: Huntsville, Ontario

Intersection ID:

Date: Friday, August 25, 2023

**Total 8-Hour Count** 

#### AM Peak Hour: 7:45 to 8:45 MD Peak Hour: - to -

				Ki	tchen I	Rd S										Kito	hen R	d S			
North 1	Total	17						East	Total	0		North	n Total	0					East	Total	0
North Ente	ering	9	Cyclists	0	0	0	E	ast En	tering	0		North Er	ntering	0	Cyclists	-	-	-	East En	tering	0
North Recei	iving	8	Truck	0	1	0	Eas	st Rec	eiving	0		North Red	ceiving	0	Truck	-	-	-	East Rec	eiving	0
North F	Peds	3	Cars	4	4	0		East	Peds	0		North	n Peds	-	Cars	-	-	-	East	Peds	-
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West 7	Total	14		6	5	0		South	Total	17		Wes	t Total	0		-	-	-	South	Total	0
West Ente	ering	4		0	0	0	Sou	uth En	tering	11		West Er	ntering	0		-	-	-	South En	tering	0
West Recei	iving	10		0	0	0	Sout	h Rec	eiving	6		West Red	ceiving	0		-	-	-	South Rec	eiving	0
West F	Peds	0		<u>Ki</u>	tchen I	Rd S	•	South	Peds	0		Wes	t Peds	-		Kito	hen R	<u>d S</u>	South	Peds	-

# PM Peak Hour: 17:00 to 18:00

#### Kitchen Rd S Kitchen Rd S North Total 30 North Total 82 East Total 0 East Entering 0 North Entering 0 2 North Entering 43 Cyclists 0 2 East Entering 0 North Receiving 13 0 East Receiving 0 North Receiving 39 Truck 0 2 East Receiving 0 3 12 8 31 North Peds East Peds 3 North Peds 7 East Peds 9 Cars 0 Cars 5 **\_\_** 0 0 0 0 0 0 0 0 0 0 -> **←** 0 0 0 1 1 2 2 2 0 0 0 -13 す 0 5 \_ 0 0 0 0 0 0 West Total 19 10 10 South Total 41 West Total 48 19 30 South Total 102 South Entering 22 South Entering 53 West Entering 6 West Entering 20 West Receiving 13 South Receiving 19 West Receiving 28 South Receiving 49 West Peds 2 South Peds 0 South Peds 0 Kitchen Rd S West Peds 4 Kitchen Rd S

Trans-Plan Transportation Inc.
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# **Turning Movement Count Diagram**

Intersection: Cairns Drive and Cairns Crescent Municipality: Huntsville, Ontario

Intersection ID:

Date: Friday, August 25, 2023

MD Peak Hour: - to -

# AM Peak Hour: 7:45 to 8:45

			Ca	irns Dr	ve							Cai	ims Dri	ve		
North Total	210					East Total	17		North Total	0					East Total	0
North Entering	124	Cyclists	1	0	0	East Entering	12		North Entering	0	Cyclists	-	-	-	East Entering	0
North Receiving	86	Truck	3	0	1	East Receiving	5		North Receiving	0	Truck	-	-	-	East Receiving	0
North Peds	0	Cars	117	0	2	East Peds	0		North Peds	-	Cars	-	-	-	East Peds	-
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West Total	201		0	0	0	South Total	0		West Total	0		-	-	-	South Total	0
West Entering	78		0	0	0	South Entering	0		West Entering	0		-	-	-	South Entering	0
West Receiving	123		0	0	0	South Receiving	0		West Receiving	0		-	-	-	South Receiving	0
West Peds	0			n/a		South Peds	0		West Peds	-			n/a		South Peds	-

# PM Peak Hour: 16:15 to 17:15

## **Total 8-Hour Count**

North Entering 43 Cyclists 0 0 0 0 East Entering 7 North Entering 327 Cyclists 2 0 0 East Entering	62 35 27 0
North Receiving 113 Truck 2 0 0 East Receiving 8 North Receiving 359 Truck 15 0 1 East Receiving North Peds 0 Cars 35 0 6 East Peds 0 North Peds 1 Cars 289 0 20 East Peds 1 1 1 1 104 1 1 1 104 1 1 1 1 104 1 1 1 1	27
North Peds 0 Cars 35 0 6 East Peds 0 North Peds 1 Cars 289 0 20 East Peds    1 1 1 104	
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West Total         145         0         0         0         South Total         0         West Total         644         0         0         0         South Total	0
West Entering 108 0 0 0 South Entering 0 West Entering 334 0 0 0 South Entering	0
West Receiving 37 0 0 0 South Receiving 0 West Receiving 310 0 0 0 South Receiving	0
West Peds 0 n/a South Peds 0 West Peds 0 n/a South Peds	1

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		Г			0	0	0		0	0	0	0			0	0	0	0	0	0	0	0	0
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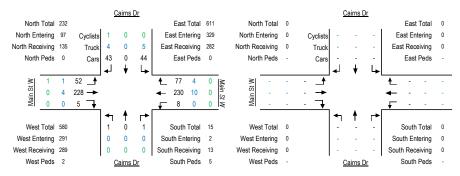
Intersection: Main Street West and Cairns Drive Municipality: Huntsville, Ontario

Intersection ID:

Date: Friday, August 25, 2023

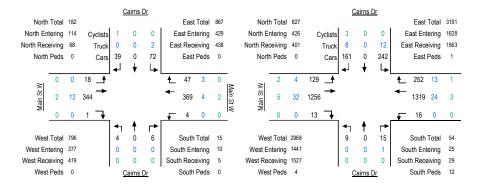
#### AM Peak Hour: 7:45 to 8:45

# MD Peak Hour: - to



#### PM Peak Hour: 16:00 to 17:00

## **Total 8-Hour Count**



<Existing> Weekday AM Peak Hour

						AND MADE MADE MADE MADE	
	1	Ť	ļ	1	*	*	
Movement	EBI	B	WBT	WBR	88	SBR	
Lane Configurations		4	2		2		
Traffic Volume (vehfh)	5	243	105	110	119	121	
Future Volume (Veh/h)	\$	243	105	110	119	121	
Sign Control		Free	Free		Stop		
Grade		%0	%		%		
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	
Hourly flow rate (vph)	92	583	125	131	142	144	
Pedestrians							
Lane Width (m)							
Walking Speed (m/s)							
Percent Blockage							
Right furn flare (veh)							
Median type		None	None				
Median storage veh)							
Upstream signal (m)							
pX, platoon unblocked							
vC, conflicting volume	256				516	190	
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	256				516	190	
tC, single (s)	4.6				6.5	6.2	
tC, 2 stage (s)							
IF (s)	5.6				3.6	3.3	
pg dnene free %	88				72	83	
oM capacity (veh/h)	1087				205	851	
Direction, Lane#	EB 1	WB 1	88				
Volume Total	307	256	286				
Volume Left	92	0	142				
Volume Right	0	131	144				
-SS	1087	1700	633				
Volume to Capacity	0.02	0.15	0.45				
Queue Length 95th (m)	0.4	0.0	18.8				
Control Delay (s)	9.0	0.0	15.3				
Lane LOS	∢		O				
Approach Delay (s)	9.0	0.0	15.3				
Approach LOS			O				
Intersection Summary							
Average Delay		l	5.4	l			
Memoring model Hillandon	- Long		VE 00%	2	CIT Lougl of Consiso	Conion	<
ITTER SECTION CAPACITY OFFICE	HOLI		0.05	2	n rever	BOMJBO	£

* * + *	WBL WBT NBL NBR	* *	0 197 19	0 197 19	Free Stop	%0 %0	0.94	0 210						None				385 518 308		
1	EBR		7	\$			0.94	53												
1	EBT	2	218	218	Free	%6	0.94	232						None						
	overnent	ne Configurations	affic Volume (vehfh)	ture Volume (Veh/h)	gn Control	ade	ak Hour Factor	urly flow rate (vph)	destrians	ne Width (m)	alking Speed (m/s)	roent Blockage	tht turn flare (veh)	edian type	edian storage veh)	ostream signal (m)	, platoon unblocked	conflicting volume	1, stage 1 confivol	

¥.
ICU Level of Service
U Level
2
35.8%
llization
Average Delay Intersection Capacity Utilization

HCM Unsignalized Intersection Capacity Analysis 3: Cairns Drive & Main Street West

<Existing> Weekday AM Peak Hour 04-18-2024

5. Califis Drive & Maili Street West	alli olle	er we	3									10.00
	1	1	1	1	ţ	1	•	<b>←</b>	•	٨	<b>→</b>	*
Movement	BB	8	BB	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	K	+	¥.	ji.	*		K	¢\$			4	
Traffic Volume (vehfh)	9	286	49	74	233	2	99	0	47	-	0	-
Future Volume (Veh/h)	9	586	49	74	233	ιO	8	0	47	-	0	-
Sign Control		Free			Free			Stop			Stop	
Grade		%0			%			%0			%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	Ξ	308	23	80	251	'n	达	0	51	-	0	-
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right furn flare (veh)												
Median type		None			TWLT							
Median storage veh)					2							
Upstream signal (m)												
bX. platoon unblocked												
vC. conflicting volume	256			381			742	246	308	794	96/	254
vC1, stage 1 conf vol							330	330		414	414	
vC2. stage 2 conf vol							412	416		38.1	383	
vCu, unblocked vol	256			381			742	246	308	794	262	254
(C. single (s)	4.1			4.1			7.2	6.5	6.3	7.1	6.5	62
tC, 2 stage (s)							6.2	5.5		6.1	5.5	
(F(s)	2.2			22			3.6	4.0	3.4	3.5	4.0	33
pd queue free %	8			93			88	100	93	100	100	100
cM capacity (veh/h)	1292			1209			484	483	716	440	450	790
Direction, Lane#	E8 1	EB 2	EB 3	WB 1	WB 2	NB 1	NB2	SB 1				
Volume Total	=	308	83	80	256	24	5	2				
Volume Left	Ξ	0	0	80	0	54	0	-				
Volume Right	0	0	S	0	2	0	55	-				
-SSH	1292	1700	1700	1209	1700	484	716	299				
Volume to Capacity	0.01	0.18	0.03	0.07	0.15	0.11	0.07	0.00				
Queue Length 95th (m)	0.2	0.0	0.0	1.7	0.0	3.0	1.8	0.1				
Control Delay (s)	7.8	0.0	0.0	8.2	0.0	13.4	10.4	11.4				
Lane LOS	∢			4		00	œ	00				
Approach Delay (s)	07			1.9		11.9		11.4				
Approach LOS						00		00				
Intersection Summary												
Average Delay			2.5									
Intersection Canacity Hillipation	uoy		38.0%	2	ICLI Level of Service	Sarvina			٩			ı

Proposed Residential Development 20 Calims Crescent, Trans-Plan

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HCM Unsignalized Intersection Capacity Analysis 4: Calms Crescent & Calms Drive

<Existing> Weekday AM Peak Hour 04-18-2024

	1	†	ļ	1	•	*	
Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations		4	2		1		
Traffic Volume (wehlh)	88	4	5	9	9	120	
Future Volume (Veh/h)	88	4	2	9	e	120	
Sign Control		Free	Free		Slop		
Grade		%0	%0		%		
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	
Hourly flow rate (vph)	8	4	2	Ξ	က	135	
Pedestrians							
Lane Width (m)							
Walking Speed (m/s)							
Percent Blockage							
Right furn flare (veh)							
Median type		None	Nane				
Median storage veh)							
Upstream signal (m)							
pX, platoon unblocked							
vC, conflicting volume	3				204	80	
vC1, stage 1 confivol							
vC2, stage 2 confivol							
vCu, unblocked vol	5				204	00	
tC, single (s)	42				6.4	6.2	
tC, 2 stage (s)							
tF(s)	2.3				3.5	3.3	
% eauj enenb pd	ත්				100	87	
oM capacity (veh/h)	1567				737	1075	
Direction, Lane#	EB 1	WB1	SB 1				
Volume Total	100	13	138				
Volume Left	8	0	9				
Volume Right	0	Ξ	135				
TS.	1567	1700	1064				
Volume to Capacity	0.06	0.01	0.13				
Queue Length 95th (m)	1.6	0.0	3.6				
Control Delay (s)	72	0.0	8.9				
Lane LOS	∢		4				
Approach Delay (s)	72	0.0	8.9				
ApproachLOS			∢				
Intersection Summary							
Average Delay			7.7				
Intersection Capacity Utilization	ion		25.8%	9	Jewelo	ICU Level of Service	4
Analysis Period (min)			15				

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<Existing> Weekday AM Peak Hour 04-18-2024 HCM Unsignalized Intersection Capacity Analysis 6: Kitchen Road South & Cairns Crescent

28 8 11 64 62 4.1 3.5 3.3 2.2 100 100 100 982 1073 1608 EB1 NB1 581 5 13 11 6 4 7 0 or deader for contraction of contrac

<Existing> Weekday PM Peak Hour 04-18-2024 HCM Unsignalized Intersection Capacity Analysis 1: Aspdin Road & Highway 11 Southbound On/Off-Ramp

	1	1	ļ	1	٠	*	
Movement	EB	EBT	WBT	WBR	SS	SBR	
Lane Configurations		4	42		3		
Traffic Volume (vehfh)	15	295	128	184	88	153	
Future Volume (Veh/h)	\$	295	128	184	88	153	
Sign Control		Free	Free		Stop		
Grade		%0	%0		%		
Peak Hour Factor	0.86	0.86	98'0	98.0	98.0	0.86	
Hourly flow rate (vph)	4	343	149	214	102	178	
Pedestrians							
Lane Width (m)							
Walking Speed (m/s)							
Percent Blockage							
Right furn flare (veh)							
Median type		None	Nane				
Median storage veh)							
Upstream signal (m)							
pX, platoon unblocked							
vC, conflicting volume	363				633	256	
vC1, stage 1 confivol							
vC2, stage 2 confivol							
vCu, unblocked vol	363				633	256	
tC, single (s)	4.3				6.4	6.2	
IC, 2 stage (s)							
IF (s)	5.4				3.5	3.3	
% eay enenb pd	88				11		
oM capacity (vehifi)	1103				435	780	
Direction. Lane#	EB 1	WB1	88				
Volume Total	360	363	280				
Volume Left	17	0	102				
Volume Right	0	214	178				
- ES	1103	1700	909				
Volume to Capacity	0.02	0.21	0.46				
Queue Length 95th (m)	0.4	0.0	19.5				
Control Delay (s)	0.5	0.0	16.0				
Lane LOS	4		ပ				
Approach Delay (s)	0.5	0.0	16.0				
ApproachLOS			ပ				
Intersection Summary							
Average Delay			4.7				
Intersection Capacity Utilization	L		48.7%	O	CU Level of Service	Service	×
Analysis Period (min)			15				

<Existing> Weekday PM Peak Hour HCM Unsignalized Intersection Capacity Analysis 2: Highway 11 Northbound Off-Ramp & Aspdin Road

	l	١			١	2000	
	1	1	/	ļ	1	•	
Movement	E81	EBR	WBL	WBT	NBL	NBR	
Lane Configurations	43			*	No.		
Traffic Volume (vehfh)	224	159	0	293	19	203	
Future Volume (Veh/h)	224	129	0	293	19	203	
Sign Control	Free			Free	Stop		
Grade	%0			%	%		
Peak Hour Factor	0.90	0.90	080	0.90	0.90	0.90	
Hourly flow rate (vph)	249	177	0	326	21	226	
Pedestrians							
Lane Width (m)							
Walking Speed (m/s)							
Percent Blockage							
Right furn flare (veh)							
Median type	None			None			
Median storage veh)							
Upstream signal (m)							
pX, platoon unblocked							
vC, conflicting volume			426		664	338	
vC1, stage 1 conf vol							
rC2, stage 2 conf vol							
vCu, unblocked val			426		664	338	
C, single (s)			4.1		6.5	6.2	
IC, 2 stage (s)							
IF (s)			22		3.6	3.3	
pg dnene tree %			90		92	68	
oM capacity (veh/h)			1133		418	707	
Direction, Lane#	E81	WB 1	NB 1				
Volume Total	426	326	247				
Volume Left	0	0	21				
Volume Right	177	0	226				
SSH	1700	1700	899				
Volume to Capacity	0.25	0.19	0.37				
Queue Length 95th (m)	0.0	0.0	13.6				
Control Delay (s)	0.0	0.0	13.5				
Lane LOS			00				
Approach Delay (s)	0.0	0.0	13.5				
Approach LOS			8				
Intersection Summary							
Average Delay			3.3				
Intersection Capacity Utilization	uo		41.8%	₫	ICU Level of Service		A
Analysis Period (min)			15				

Propos ed Residenial Developm Trans-Plan

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Movement	B	EBT	EBR	WBL	WBT	WBR	NBL	T8V	NBR	SBL	SBT	SBR
Lane Configurations	M.	+	K	F	*		K	(3			4	
Traffic Volume (vehh)	4	373	20	20	370	-	12	0	æ	47	0	9
Future Volume (Veh/h)	4	373	20	92	370	-	52	0	æ	4	0	9
Sign Control		Free			Free			Stop			Stop	
Grade		%0			%			%0			%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	405	24	20	402	-	83	0	42	4	0	7
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right furn flare (veh)												
Median type		None			TWLTL							
Median storage veh)					2							
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	403			429			862	929	409	868	910	402
vC1, stage 1 confivol							413	413		442	442	
vC2, stage 2 confivol							449	443		455	467	
vCu, unblocked vol	403			429			862	856	405	888	910	402
tC, single (s)	4.1			4.1			7.2	6.5	6.3	7.1	6.5	6.2
fC, 2 stage (s)							6.2	5.5		6.1	5.5	
F(s)	2.2			2.2			3.6	4.0	3.4	3.5	4.0	3.3
% east enenb 0d	9			88			82	9	S	66	9	66
oM capacity (veh.fn)	1156			1113			458	471	631	439	450	652
Direction, Lane#	EB 1	EB2	EB3	WB 1	WB 2	NB 1	NB 2	88 1				
Volume Total	4	405	54	20	403	82	45	Ξ				
Volume Left	<₹	0	0	50	0	82	0	4				
Volume Right	0	0	ক্ষ	0	-	0	42	7				
SH	1156	1700	1700	1113	1700	458	631	929				
Volume to Capacity	0.00	0.24	0.03	0.02	0.24	0.18	0.07	0.02				
Queue Length 95th (m)	0.7	0.0	0.0	0.4	0.0	5.2	1.7	0.5				
Control Delay (s)	8.1	0.0	0.0	8.3	0.0	14.6	Ξ	11.6				
Lane LOS	⋖			∢		00	00	00				
Approach Delay (s)	0.1			0.4		13.4		11.6				
ApproachLOS						œ		œ				
Intersection Summary												
Average Delay			13									
Intersection Capacity Utilization	ifon		35.2%	2	ICU Level of Service	Service			Ø			

Proposed Residential Dev Trans-Plan

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<Existing> Weekday PM Peak Hour HCM Unsignalized Intersection Capacity Analysis 4: Cairns Crescent & Cairns Drive

	1	Ť	ţ	1	•	`	
Movement	88	EB	WBT	WBR	88	SBR	
Lane Configurations		4	24		ž		
Traffic Volume (vehfn)	107	9	0	7	9	28	
Future Volume (Veh/h)	107	9	0	7	9	28	
Sign Control		Free	Free		Stop		
Grade		%0	%		%		
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	
Hourly flow rate (vph)	130	7	0	6	12	71	
Pedestrians							
Lane Width (m)							
Walking Speed (m/s)							
Percent Blockage							
Right furn flare (veh)							
Median type		None	None				
(ledian storage veh)							
Jostream signal (m)							
pX, platoon unblocked							
C, conflicting volume	თ				272	4	
AC1, stage 1 conf vol							
rC2, stage 2 conf vol							
Cu, unblocked vol	6				272	-4	
IC, single (s)	4.1				6.4	6.2	
IC, 2 stage (s)							
IF(s)	2.2				3.5	3.3	
od queue free %	8				88	93	
oM capacity (veh/h)	1617				664	1070	
Direction, Lane#	EB 1	WB 1	SB 1				
Volume Total	137	6	83				
Volume Left	130	0	12				
Volume Right	0	o	7				
SSE	1617	1700	983				
Volume to Capacity	0.08	0.01	80'0				
Queue Length 95th (m)	2.1	0.0	2.2				
Control Delay (s)	7.1	0.0	9.0				
Lane LOS	×		ď				
Approach Delay (s)	7.1	0.0	9.0				
Approach LOS			¥				
Intersection Summary							
Average Delay			7.5				
Intersection Capacity Utilization	uo		23.7%	₫	ICU Level of Service	Service	ď
Analysis Period (min)			15				

HCM Unsignalized Intersection Capacity Analysis 6: Kitchen Road South & Cairns Crescent

<Existing> Weekday PM Peak Hour 04-18-2024

5					l		
	4	-	1	<b>-</b>	<b>-</b>	`	
Movement	留	EBR	NBL	NBT	SBT	SBR	
Lane Configurations	2			4	2		
Traffic Volume (vehh)	-	c	2	9	12	8	
Future Volume (VehVh)	-	2	9	9	12	3	
Sign Control	Stop			Free	Free		
Grade	%			%0	%		
Peak Hour Factor	08.0	0.80	080	0.80	0.80	0.80	
Hourly flow rate (vph)	-	9	12	12	12	4	
Pedestrians							
Lane Width (m)							
Walking Speed (m/s)							
Percent Blockage							
Right furn flare (veh)							
Median type				None	None		
Median storage veh)							
Upstream signal (m)							
pX, platoon unblocked							
vC, conflicting volume	R	17	6				
vC1, stage 1 confivol							
vC2, stage 2 confivol							
vCu, unblocked vol	R	17	19				
tC, single (s)	6.4	6.2	4.1				
IC, 2 stage (s)							
F (s)	3.5	33	22				
bo dnene tree %	8	8	66				
cM capacity (veh/h)	953	1068	1611				
Direction, Lane#	EB 1	NB1	SB1				
Volume Total	7	24	19				
Volume Left	-	12	0				
Volume Right	9	0	4				
SSH	1050	1611	1700				
Volume to Capacity	0.01	0.0	000				
Queue Length 95th (m)	05	07	0.0				
Control Delay (s)	8.5	3.7	0.0				
Lane LOS	×	¥					
Approach Delay (s)	8.5	3.7	0.0				
ApproachLOS	×						
Intersection Summary							
Average Delay			2.9				
Intersection Capacity Utilization			17.7%	⊴	ICU Level of Service	Service A	
Analysis Period (min)			15				

HCM Unsignalized Intersection Capacity Analysis~2036 Background> Weekday AM Peak Hour 1: Aspdin Road & Highway 11 Southbound Off-Ramp

	4	l		*	-	,	
	1	Ť	ļ	1	٠	*	
Movement	EBL	8	WBT	WBR	SBL	SBR	
Lane Configurations		4	43		No.		
Traffic Volume (vehfh)	19	308	133	140	121	153	
Future Volume (Veh/h)	19	308	133	140	121	153	
Sign Control		Free	Free		Stop		
Grade		%0	%		%		
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	
Hourly flow rate (vph)	23	367	128	167	180	182	
Pedestrians							
Lane Width (m)							
Walking Speed (m/s)							
Percent Blockage							
Right furn flare (veh)							
Median type		None	Nane				
Median storage veh)							
Upstream signal (m)							
pX, platoon unblocked							
vC, conflicting volume	325				654	242	
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	325				654	242	
IC, single (s)	4.6				6.5	6.2	
IC, 2 stage (s)							
FF (s)	5.6				3.6	3.3	
od queue free %	88				25	77	
cM capacity (veh/h)	1020				414	797	
Direction, Lane#	EB 1	WB 1	SB 1				
Volume Total	390	325	362				
Volume Left	83	0	180				
Volume Right	0	167	182				
SST	1020	1700	246				
Volume to Capacity	0.02	0.19	990				
Queue Length 95th (m)	9.0	0.0	39.0				
Control Delay (s)	0.7	0.0	23.6				
Lane LOS	⋖		O				
Approach Delay (s)	0.7	0.0	23.6				
Approach LOS			ပ				
Intersection Summary							
Average Delay			8.2				
Intersection Capacity Utilization	note		56.2%	ಠ	IOU Level of Service	Service	<b>a</b>
Analysis Period (min)			15				

Proposed Residential Development 20 Caims Crescant, Huntsville Trans-Plan

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Proposed Residential Development 20 Caims Crescent, Huntsville Trans-Plan

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HCM Unsignalized Intersection Capacity Analysis/2036 Background> Weekday AM Peak Hour A: Carins Drive & Main Street West

Management   Man									
Mone (17) 22 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	<i>&gt;</i>	<i>&gt;</i>	1	•	<b>-</b>	4	•	-	*
Money 334 4.1 5.2 5.2 5.2 5.2 5.2 5.2 5.2 5.2 5.2 5.2		WBL WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Man (M)		ı	L	K	41			4	
(m) 13 Figure 1 Figur		94 296	9	8	0	09	-	0	_
France 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				8	0	9	-	0	-
0.000 0.000	Free	Free			Stop			Stop	
0.95 0.059 0	%0	%0			%0			%	
9) 18 20 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Ī	0.93 0.93	3 0.93	0.93	0.93	0.93	0.93	0.93	0.93
None				89	0	65	-	0	-
Mone Mone Mone Mone Mone Mone Mone Mone									
Monay  Mo									
Monwa 33.44 and 12.2									
Money 234									
Money 23.4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1									
23.24 4.1 4.1 5.24 6.	None	TWLTL							
2.2 2.2 2.2 2.2 2.2 2.2 2.2 2.2 2.2 2.2		•	01						
334 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1									
1 328 328 328 328 328 328 328 328 328 328									
1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2		457		939	944	380	1006	1008	321
3384 4.1 2.2 2.8 12.8 18.9 18.9 18.9 18.9 19.0 10.0 10.0 10.0 10.0 10.0 10.0 10				418	418		523	523	
334 41 22 22 129 129 14 39 16 0 1219 170 180 180 180 180 180 180 180 180 180 18				521	979		483	485	
41 22 22 22 22 22 22 22 23 44 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		457		939	944	380	1006	1008	321
2.2 17.99 17.99 14.1 399 14.1 399 17.00 0.0 10 0.0 0.0 0.0 0.0		4.1		7.2	6.5	6.3	7.1	6.5	62
2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2				6.2	5.5		6.1	5.5	
12.99 12.19 14. 0.90 14. 0.90 12.19 (m) 0.3 0.00 0.01 0.23 0.01 0.23 0.01 0.23 0.01 0.23 0.01 0.23 0.01 0.23 0.01 0.23 0.01 0.23 0.02 0.03 0.03 0.03		2.2		3.6	4.0	3.4	3.5	4.0	33
1219 EB1 EB2 EB1 14 350 17 14 350 17 17 17 17 17 17 17 17 17 17 17 17 17		91		æ	8	90	9	8	8
14 390 14 390 14 390 10 0 0 0 0.01 0.23 0.3 0.0 8.0 0.0 A A		1114		402	41	643	342	373	724
14 390 14 0 0 0 0 0 0.01 0.23 0.3 0.0 8.0 0.0 A A	Г	WB1 WB2	NB 1	NB2	88 1				
14 0 0 0 0 11219 1700 0.00 1.023 0.00 8.0 0.00 0.00 0.00 0.00 0.00 0.00		101 324		99	2				
0 0 1219 1700 0.001 0.23 0.00 8.0 0.0			0 68	0	-				
1219 1700 0.01 0.23 0.3 0.0 8.0 0.0 A				99	-				
0.01 0.23 0.3 0.0 8.0 0.0 A A 0.0	_	1114 1700	405	643	468				
03 00 80 00 A 02				0.10	0.0				
8.0 0.2 A 0.0		2.4 0.0	4.8	2.7	0.1				
0 5 A				112	12.7				
07		¥	ပ	8	8				
		2.0	13.6		12.7				
			00		œ				
	2.7								
	40.5%	IOU Leve	ICU Level of Service			4			
	15								

HCM Unsignalized Intersection Capacity Analysis-2036 Background> Weekday AM Peak Hour 4: Calms Crescent & Calms Drive

4. Callis Glescell & Callis Dilye		D D I A					707 01 40
	4	1	ļ	1	٠	•	
Movement	EBE	EBT	WBT	WBR	쩅	SBR	
Lane Configurations		4	23		3		
Traffic Volume (vehh)	108	5	က	13	4	152	
Future Volume (Veh/h)	108	2	e	13	4	152	
Sign Control		Free	Free		Stop		
Grade		%0	%0		%		
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	
Hourly flow rate (vph)	121	9	e	12	4	171	
Pedestrians							
Lane Width (m)							
Walking Speed (m/s)							
Percent Blockage							
Right furn flare (veh)							
Median type		None	None				
Median storage veh)							
Upstream signal (m)							
pX, platoon unblocked							
vC, conflicting volume	8				258	10	
vC1, stage 1 confivol							
vC2, stage 2 confivol							
vCu, unblocked vol	8				258	9	
tC, single (s)	42				6.4	6.2	
IC, 2 stage (s)							
IF (s)	2.3				3.5	3.3	
bg dnene free %	8				66	84	
oM capacity (veh/h)	1561				674	1071	
Direction, Lane#	EB 1	WB1	88 -				
Volume Total	127	92	175				
Volume Left	121	0	4				
Volume Right	0	12	171				
SSH	1561	1700	1056				
Volume to Capacity	0.08	0.01	0.17				
Queue Length 95th (m)	2.0	0.0	4.7				
Control Delay (s)	72	0.0	9.1				
Lane LOS	ď		¥				
Approach Delay (s)	72	0.0	9.1				
ApproachLOS			4				
Intersection Summary							
Average Delay			7.8				
Intersection Capacity Utilization			29.2%	o	ICU Level of Service	Service	ď
Analysis Period (min)			5				

HCM Unsignalized Intersection Capacity Analysis-2036 Background> Weekday AM Peak Hour 5: Site Access 1 & Carns Crescent

	1	*	1	ļ	1	~	
Movement	EBT	EBR	WBL	WBT	NBL	NBR	
Lane Configurations	43			v	1		
Traffic Volume (vehh)	ıo	0	0	13	0	0	
Future Volume (Veh/h)	40	0	0	13	0	0	
Sign Control	Free			Free	Stop		
Grade	%0			%	%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	2	0	0	7	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			2		19	2	
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol			c)		19	22	
fC, single (s)			4.1		6.4	6.2	
tC, 2 stage (s)							
IF (s)			22		3.5	3.3	
% eaul enenb 0d			100		100	100	
oM capacity (veh/h)			1616		866	1078	
Direction, Lane#	EB 1	WB 1	NB 1				
Volume Total	2	4	0				
Volume Left	0	0	0				
Volume Right	0	0	0				
CSH.	1700	1616	1700				
Volume to Capacity	0.00	0.00	000				
Queue Length 95th (m)	0.0	0.0	0.0				
Control Delay (s)	0.0	0.0	0.0				
Lane LOS			ď				
Approach Delay (s)	0.0	0.0	0.0				
Approach LOS			4				
Intersection Summary							
Average Delay			0.0				
Intersection Capacity Utilization	L		9.7%	⊴	ICU Level of Service	Service	∢
Analysis Period (min)			15				

Proposed Residential Development 20 Caims Crescent, Huntsville Trans-Plan

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HCM Unignalized Intersection Capacity Analysis:2036 Background> Weekday AM Peak Hour 6: Kitchen Road South & Carns Crescent

	\	*	r !	-		•	
Movement	H	EBX	NBL	NBI	33	SBK	
Lane Configurations	-			4	4		
Traffic Volume (vehfn)	4	-	00	9	9	2	
Future Volume (Veh/h)	4	-	œ	9	9	es.	
Sign Control	Stop			Free	Free		
Grade	%			%0	%		
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	
Hourly flow rate (vph)	2	-	9	7	7	9	
Pedestrians							
Lane Width (m)							
Walking Speed (m/s)							
Percent Blockage							
Right furn flare (veh)							
Median type				None	Nane		
Median storage veh)							
Upstream signal (m)							
pX, platoon unblocked							
vC, conflicting volume	37	9	13				
vC1, stage 1 confivol							
vC2, stage 2 confivol							
vCu, unblocked vol	37	9	13				
fC, single (s)	6.4	62	4.1				
tC, 2 stage (s)							
IF (s)	3.5	33	22				
% eas enenb 0d	8	8	66				
cM capacity (veh/h)	696	1071	1606				
Direction, Lane#	EB 1	NB 1	SB 1				
Volume Total	9	17	13				
Volume Left	2	9	0				
Volume Right	-	0	9				
SSH	382	1606	1700				
Volume to Capacity	0.01	0.01	0.01				
Queue Length 95th (m)	0.7	07	0.0				
Control Delay (s)	8.7	4.3	0.0				
Lane LOS	×	×					
Approach Delay (s)	8.7	4.3	0.0				
ApproachLOS	ď						
Intersection Summary							
Average Delay			3.5				
Intersection Capacity Utilization	ç		17.4%	ō	ICU Level of Service	Service A	
Analysis Period (min)			15				

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HCM Unsignalized Intersection Capacity Analysis-2036 Background> Weekday AM Peak Hour 7: Kitchen Read South & Site Access 2 9:18.203

/: Kitchen Road South & Site Access 2	outh & S	ite Acc	Sess 7				04-18-2024
	1	1	1	<b>←</b>	<b>→</b>	•	
Movement	88	BB	NBL	NBT	SBT	SBR	
Lane Configurations	15			¥	42		
Traffic Volume (vehfh)	. 0	0	0	2	œ	0	
Future Volume (Veh/h)	0	0	0	4	00	0	
Sign Control	Stop			Free	Free		
Grade	%0			%	%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	0	0	0	12	o	0	
Pedestrians							
Lane Width (m)							
Walking Speed (m/s)							
Percent Blockage							
Right furn flare (veh)							
Median type				Nane	Nane		
Median storage weh)							
Upstream signal (m)							
pX, platoon unblocked							
vC, conflicting volume	%	6	6				
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked val	*	6	6				
tC, single (s)	6.4	62	4.1				
tC, 2 stage (s)							
F(s)	3.5	3.3	22				
pg dnene tree %	8	8	9				
oM capacity (weh/h)	385	1073	1611				
Direction, Lane#	E8 1	- 89 	88 +				
Volume Total	0	15	6				
Volume Left	0	0	0				
Volume Right	0	0	0				
-SS	1700	1611	1700				
Volume to Capacity	0.00	0.00	0.01				
Queue Length 95th (m)	0.0	0.0	0.0				
Control Delay (s)	0.0	0.0	0.0				
Lane LOS	∢						
Approach Delay (s)	0.0	0.0	0.0				
Approach LOS	V						
Intersection Summary							
Average Delay			0.0				
Intersection Capacity Utilization	uoje		9.7%	2	ICU Level of Service	Service	
Analysis Period (min)			15				

HCM Unsignalized Intersection Capacity Analysis-2038 Background> Weekday PM Peak Hour 1: Aspdin Road & Highway 11 Southbound Off-Ramp

: Aspdin Koad & Highway 11 Southbound Off-Kamp	IIgnway	7	iguan ↓	ō g	.Kam		U4-18-2024
,	EBE	EBI	WBI	WBR	SBL	SBK	
ane Corrigurations	9	374	45 27 45 27	233	- 2	102	
uture Volume (Veh/h)	19	374	162	233	112	194	
ign Control		Free	Free		Stop		
		%0	%0		%		
eak Hour Factor	0.86	0.86	98'0	98.0	98.0	0.86	
fourly flow rate (vph)	83	435	188	27.1	130	226	
edestrians							
ane Width (m)							
Valking Speed (m/s)							
ercent Blockage							
ight furn flare (veh)							
fedian type		None	None				
(edian storage veh)							
lpstream signal (m)							
X, platoon unblocked							
C, conflicting volume	459				802	324	
C1, stage 1 confivol							
C2, stage 2 confivol							
Cu, unblocked vol	459				802	324	
C, single (s)	43				6.4	6.2	
C, 2 stage (s)							
	2.4				3.5	3.3	
0 doene free %	88				62	89	
M capacity (veh.fn)	1014				344	715	
irection, Lane#	E81	WB1	88 +				
Volume Total	457	459	326				
olume Left	8	0	130				
olume Right	0	271	528				
	1014	1700	513				
folume to Capacity	0.02	0.27	69'0				
Jueue Length 95th (m)	0.5	0.0	42.8				
control Delay (s)	0.7	0.0	26.4				
ane LOS	¥		٥				
oproach Delay (s)	0.7	0.0	26.4				
(pproach LOS			0				
Hersection Summary							
werage Delay			7.6				
nersection Capacity Utilization	lon		%0.09	0	CU Level of Service	Service	8
nalysis Period (min)			15				

HCM Unsignalized Intersection Capacity Analysis-2036 Background> Weekday PM Peak Hour 2. Highway 11 Northbound Off-Ramp & Aspdin Road

HCM Unsignalized Intersection Capacity Analysis 2036 Background> Weekday PM Peak Hour 3. Caims Drive & Main Street West

	†	~	1	ļ	•	*	
Movement	EBT	EBR	WBL	WBT	NBL	NBR	
Lane Configurations	43			*	N.		
Traffic Volume (vehfh)	284	202	0	372	24	257	
Future Volume (Veh/h)	284	202	0	372	54	257	
Sign Control	Free			Free	Stop		
Grade	%0			%	%		
Peak Hour Factor	0.90	0.90	060	0.90	06.0	0.90	
Hourly flow rate (vph)	316	224	0	413	27	286	
Pedestrians							
Lane Width (m)							
Walking Speed (m/s)							
Percent Blockage							
Right furn flare (veh)							
Median type	None			None			
Median storage veh)							
Upstream signal (m)							
pX, platoon unblocked							
vC, conflicting volume			240		841	428	
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol			240		841	428	
tC, single (s)			4.1		6.5	6.2	
tC, 2 stage (s)							
IF (s)			22		3.6	3.3	
% eauf enenp 0d			100		95	55	
oM capacity (veh/h)			1028		328	629	
Direction, Lane#	EB 1	WB 1	NB 1				
Volume Total	240	413	313				
Volume Left	0	0	27				
Volume Right	224	0	286				
-SH	1700	1700	583				
Volume to Capacity	0.32	0.24	0.54				
Queue Length 95th (m)	0.0	0.0	25.4				
Control Delay (s)	0.0	0.0	18				
Lane LOS			O				
Approach Delay (s)	0.0	0.0	18.1				
Approach LOS			ပ				
Intersection Summary							
Average Delay			4.5				
Intersection Capacity Utilization	_		51.2%	⊴	ICU Level of Service	Service	
Analysis Period (min.)			15				

514 6.3 3.4 547

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Proposed Residential Development 20 Caims Crescent, Trans-Plan

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HCM Unsignalized Intersection Capacity Analysis'-2036 Background> Weekday PM Peak Hour 4: Cairns Crescent & Cairns Drive 0+18.2034

4. Califis Crescent & Califis Drive	S Call	S DIV		ı	ı		04-10-07 <i>D</i> #
	4	1	ţ	1	٨	*	
Movement	EBI	B	WBT	WBR	쩅	SBR	
Lane Configurations		4	2		3		
Traffic Volume (vehfh)	138	00	0	6	13	74	
Future Volume (Veh/h)	136	80	0	6	13	74	
Sign Control		Free	Free		Stop		
Grade		%0	%		%		
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	
Hourly flow rate (vph)	166	9	0	Ξ	16	90	
Pedestrians							
Lane Width (m)							
Walking Speed (m/s)							
Percent Blockage							
Right furn flare (veh)							
Median type		None	Nane				
Median storage veh)							
Upstream signal (m)							
pX, platoon unblocked							
vC, conflicting volume	Ξ				348	9	
C1, stage 1 conf vol							
vC2, stage 2 conf vol							
Cu, unblocked vol	=				348	9	
IC, single (s)	4.1				6.4	6.2	
IC, 2 stage (s)							
IF (s)	2.2				3.5	3.3	
od queue free %	8				97	95	
oM capacity (veh/h)	1615				586	1069	
Direction, Lane#	E81	WB 1	88 1				
Volume Total	176	F	106				
Volume Left	98	0	16				
Volume Right	0	Ξ	90				
SSH	1615	1700	921				
Volume to Capacity	0.10	0.01	0.11				
Queue Length 95th (m)	2.7	0.0	3.0				
Control Delay (s)	7.1	0.0	9.3				
Lane LOS	×		V				
Approach Delay (s)	7.1	0.0	9.3				
Approach LOS			¥				
Intersection Summary							
Average Delay			7.6				
Intersection Capacity Utilization	lon		26.6%	ō	ICU Level of Service	Service	¥
Analysis Period (min)			15				

HCM Unsignalized Intersection Capacity Analysis/2008 Background> Weekday PM Peak Hour 5: Site Access 1.8, Carris Crescent 01:18-20A

<ol> <li>Site Access 1 &amp;</li> </ol>	& Cairns Crescent	resce	z				04-18-20.24
	Ť	-	1	ţ	•	•	
Movement	EBT	EBR	WBL	WBT	NBL	NBR	
ane Configurations	2,			4	3		
raffic Volume (vehfh)	00	0	0	16	0	0	
-uture Volume (Veh/h)	80	0	0	16	0	0	
Sign Control	Free			Free	Stop		
Grade	8			%0	%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	6	0	0	17	0	0	
Pedestrians							
ane Width (m)							
Walking Speed (m/s)							
Percent Blockage							
Sight furn flare (veh)							
Median type	None			None			
(ledian storage veh)							
Jostream signal (m)							
X. platoon unblocked							
C. conflicting volume			σ		56	6	
C1. stage 1 confivol							
C2. stage 2 confivol							
Cu. unblocked vol			6		26	6	
C. single (s)			4.1		6.4	6.2	
C, 2stage (s)							
F(s)			22		3.5	3.3	
30 queue free %			100		100	100	
M capacity (veh/h)			1611		686	1073	
Direction, Lane#	EB 1	WB1	NB1				
/olume Total	o	17	0				
Volume Left	0	0	0				
/olume Right	0	0	0				
表	1700	1611	1700				
Volume to Capacity	0.01	0.00	000				
Queue Length 95th (m)	00	0.0	0.0				
Control Delay (s)	00	0.0	0.0				
Lane LOS			4				
Approach Delay (s)	00	0.0	0.0				
ApproachLOS			4				
ntersection Summary							
Average Delay			0.0				
ntersection Capacity Utilization	ijou		82.9	2	CU Level of Service	Service	4
Analysis Period (min)			15				

HCM Unsignalized Intersection Capacity Analysis-2036 Background> Weekday PM Peak Hour 6: Kitchen Road South & Cairns Crescent

	1	~	1	-	+	*	
Vovement	188	EBR	NBI	NBT	SBT	SBR	
Lane Configurations	N. A.			A	43		
raffic Volume (vehfh)	-	9	13	13	12	4	
Future Volume (Veh/h)	-	9	5	13	12	4	
Sign Control	Stop			Free	Free		
Grade	%0			%	%		
Peak Hour Factor	0.80	0.80	080	0.80	0.80	0.80	
Hourly flow rate (vph)	-	œ	16	16	19	10	
Pedestrians							
ane Width (m)							
Walking Speed (m/s)							
Percent Blockage							
Right furn flare (veh)							
Median type				None	None		
Median storage veh)							
Jostream signal (m)							
pX, platoon unblocked							
<ul> <li>C, conflicting volume</li> </ul>	2	83	24				
rC1, stage 1 conf vol							
rC2, stage 2 conf vol							
<ul> <li>Cu, unblocked vol</li> </ul>	2	83	24				
C, single (s)	6.4	6.2	4.1				
IC, 2 stage (s)							
F(s)	3.5	3.3	2.2				
mod dnene tree %	9	8	66				
oM capacity (veh/h)	931	1062	1604				
Direction, Lane#	E81	- 92 - 12	SB 1				
Volume Total	o	33	24				
Volume Left	-	16	0				
Volume Right	00	0	S				
-SS	1045	1604	1700				
Volume to Capacity	0.01	0.01	0.01				
Queue Length 95th (m)	07	0.2	0.0				
Control Delay (s)	8.5	3.7	0.0				
Lane LOS	∢	⋖					
Approach Delay (s)	8.5	3.7	0.0				
Approach LOS	∢						
ntersection Summary							
Average Delay			3.0				
Intersection Capacity Utilization	uo		18.1%	0	ICU Level of Service	Service	

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Proposed Residential Development 20 Cairns Crescent, Huntsville Tans-Plan

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HOM Unsignalized Intersection Capacity Analysis (2036 Totals Weekday AM Peak Hour 1: Aspulin Road & Highway 1: Southbound Off-Ramp (1: Aspulin Road & Highway 1: Southbound Off-Ramp (1: Aspulin Road & Highway 1: Southbound Off-Ramp (1: Aspulin Road & Highway 1: Aspulin Road & Hi

I. Aspaill toda & Highway 11 Southboard Oil-Famp	i iigiiwa y	5	Sall In	2	-Nam		04-10-2028
	4	Ť	ţ	1	٨	<b>~</b>	
Movement	EBL	E81	WBT	WBR	SBL	SBR	
Lane Configurations		4	4		A. A.		
Traffic Volume (wehfn)	49	309	137	238	151	153	
Future Volume (Veh/h)	9	308	137	238	151	153	
Sign Control		Free	Free		Stop		
Grade		%0	%		%		
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	
Hourly flow rate (vph)	23	368	163	283	180	182	
Pedestrians							
Lane Width (m)							
Walking Speed (m/s)							
Percent Blockage							
Right furm flare (veh)							
Median type		None	None				
Median storage veh)							
Upstream signal (m)							
pX, platoon unblocked							
vC, conflicting volume	446				718	304	
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	446				718	304	
tC, single (s)	4.6				6.5	6.2	
(C, 2 stage (s)							
IF (s)	5.6				3.6	3.3	
pg dnene tree %	26				25	75	
cM capacity (veh/h)	913				378	735	
Direction, Lane#	EB 1	WB 1	SB 1				
Volume Total	391	446	362				
Volume Left	8	0	180				
Volume Right	0	283	182				
돐	913	1700	501				
Volume to Capacity	0.03	0.28	0.72				
Queue Length 95th (m)	9.0	0.0	46.9				
Control Delay (s)	0.8	0.0	28.8				
Lane LOS	¥		٥				
Approach Delay (s)	0.8	0.0	28.8				
Approach LOS			O				
Intersection Summary							
Average Delay			9.0				
Intersection Capacity Utilization	ation		56.2%	₫	ICU Level of Service	Service	8
Analysis Period (min)			15				

HCM Unsignalized Intersection Capacity Analysis <2036 Total> Weekday AM Peak Hour P. Hghway 11 Northbound Off-Ramp & Aspdin Road 9-18-2024

2: Highway 11 Northbound Off-Ramp & Aspdin Road	punoc	Off-Ra	amp &	Aspdii	n Road		04-18-2024
	Ť	~	1	ļ	1	•	
Movement	EBI	EBR	WBL	WBT	NBI	NBR	
Lane Configurations	43			*	N.		
Traffic Volume (vehfh)	279	183	0	259	24	162	
Future Volume (Veh/h)	279	38	0	259	24	162	
Sign Control	Free			Free	Stop		
Grade	%			%0	%		
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	
Hourly flow rate (vph)	297	135	0	276	56	172	
Pedestrians							
Lane Width (m)							
Walking Speed (m/s)							
Percent Blockage							
Right furn flare (veh)							
Median type	None			None			
Median storage veh)							
Upstream signal (m)							
pX, platoon unblocked							
vC, conflicting volume			492		670	384	
vC1, stage 1 confivol							
vC2, stage 2 confivol							
vCu, unblocked vol			492		670	394	
tC, single (s)			4.1		8.9	6.3	
rC, 2 stage (s)							
IF (s)			22		3.9	3.4	
nd queue free %			90		93	73	
oM capacity (veh.fh)			1082		366	640	
Direction, Lane#	EB 1	WB1	NB1				
Volume Total	492	276	198				
Volume Left	0	0	56				
Volume Right	199	0	172				
SSH	1700	1700	285				
Volume to Capacity	0.29	0.16	0.34				
Queue Length 95th (m)	00	0.0	12.0				
Control Delay (s)	00	0.0	14.3				
Lane LOS			00				
Approach Delay (s)	00	0.0	14.3				
ApproachLOS			8				
Intersection Summary							
Average Delay			2.9				
Intersection Capacity Utilization	_		43.9%	0	CU Level of Service	Service	ď
Analysis Period (min)			15				

HCM Unsignalized Intersection Capacity Analysis <2036 Total> Weekday AM Peak Hour 3. Cairns Dirve & Main Street West

| Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Proceedings | Procedings | Procedings | Procedings | Procedings | Proceedings | Procedings | Proceding

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HCM Unsignalized Intersection Capacity Analysis 4: Caims Crescent & Cairns Drive

<2036 Total> Weekday AM Peak Hour

Machine   Columbia		1	†	,	1	*	*	
Volume (vehib)   108   7   37   9   152	Movement	EBL	EBT	WBT	WBR	88	SBR	
Avoidarie (Newhit) 1 (108 g 7 7 37 g 9 1522  Avoidarie (Newhit) 1 (108 g 7 7 37 g 9 1522  Avoidarie (Newhit) 1 (108 g 7 7 37 g 9 1522  Avoidarie (Newhit) 1 (108 g 10 7 37 g 9 1522  Avoidarie (Newhit) 1 (21 g 10 g	Lane Configurations		4	43		1		
Mount (Newly ) 108 9 7 37 99 152 152 152 152 152 152 152 152 152 152	Traffic Volume (vehh)	108	6	_	37	6	152	
Press   Pres	Future Volume (Veh/h)	108	6	7	37	6	152	
Face Process	Sign Control		Free	Free		Stop		
Parameter   Para	Grade		%0	%0		%		
Figure (Inche) (21 10 8 42 10 171 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	
Morth (m)  Morth (m)  1 (Social (m)	Hourly flow rate (vph)	121	9	80	42	9	171	
Speed (mile)	Pedestrians							
Rocker (May)	Lane Width (m)							
Biochaele	Walking Speed (m/s)							
Note	Percent Blockage							
Name	Right furn flare (veh)							
Assistance with assistance with assistance with assistance with assistance with assistance with a size of the control of the c	Median type		None	Nane				
Conversion   Con	Median storage veh)							
The Park Park Park Park Park Park Park Park	Upstream signal (m)							
March   Marc	pX, platoon unblocked							
Manager   Control Note	vC, conflicting volume	99				281	29	
Page 2 convolution   201   22   22   22   22   22   22   2	vC1, stage 1 confivol							
March   Marc	vC2, stage 2 conf vol							
March   Marc	vCu, unblocked vol	8				281	29	
March   Marc	tC, single (s)	42				6.4	6.2	
10   10   10   10   10   10   10   10	tC, 2 stage (s)							
1	IF (s)	2.3				3.5	3.3	
month (Mehhh) (15) (15) (15) (15) (15) (15) (15) (15	% east enemb 0d	83				86	84	
Internal EST WEST SST   1 1 12 0 16 17 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	cM capacity (veh/h)	1519				653	1046	
1 1 1 5 0 181  1 1 1 2 0 101  1 1 1 2 0 101  1 1 1 2 0 101  1 1 2 0 101  1 1 2 0 101  1 1 2 0 101  1 1 2 0 101  1 1 2 0 101  1 2 1 2 0 101  1 2 1 2 0 101  1 3 1 2 0 101  1 3 1 2 0 101  1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1	Direction, Lane#	EB 1	WB1	SB 1				
12	Volume Total	131	90	181				
1	Volume Left	121	0	9				
Section   Sect	Volume Right	0	45	171				
Juppoly 0.88 0.08 0.18  10.91/6) 1.00 5.2  10.91/6) 1.00 5.2  10.91/6) 1.00 5.2  10.91/6) 1.00 5.2  10.91/6  10	-SST	1519	1700	1012				
101/58 (n) 2 0.0 5.2 (n) 2 (n)	Volume to Capacity	0.08	0.03	0.18				
yr) (a) 7.0 0.0 3.3  Malaule (a) 7.0 0.0 3.3  SS	Queue Length 95th (m)	2.1	0.0	52				
A A A A A A A A A A A A A A A A A A A	Control Delay (s)	7.0	0.0	9.3				
70 00 93  W 72  Hilliageon 27% CU Lewit of Service 15	Lane LOS	∢		4				
y 72 72 10U lavel of Service 15 10U lavel of Service 1	Approach Delay (s)	2.0	0.0	93				
7 7 72 72 Vilization 29.7% ICU Level of Service 15	ApproachLOS			<				
7.2 Ulitzafon 29.7% ICU Level of Service 15	Intersection Summary							
Utilization 29.7% ICU Level of Service	Average Delay			7.2				
	Intersection Capacity Utilization			29.7%	DOI	Level of		
	Analysis Period (min)			15				

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> HCM Unsignalized Intersection Capacity Analysis <2036 Total> Weekday AM Peak Hour B: Site Access 1 & Caims Crescent 04:18204

| Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Management | Man

HCM Unsignalized Intersection Capacity Analysis <2036 To 6: Kitchen Road South & Cairns Crescent

<2036 Total> Weekday AM Peak Hour 04:18:3034

6: Kitchen Road South & Cairns Crescent	S S	airns	resce	٤			04-18-2
	1	*	•	•	-	*	
Movement	盟	EBR	NBL	NBT	SBT	SBR	
Lane Configurations	ž			4	24		
Traffic Volume (vehfh)	12	-	00	17	9	9	
Future Volume (Veh/h)	12	-	80	17	9	9	
Sign Control	Stop			Free	Free		
Grade	%			%0	%		
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	
Hourly flow rate (vph)	18	-	9	20	12	7	
Pedestrians							
Lane Width (m)							
Walking Speed (m/s)							
Percent Blockage							
Right furn flare (veh)							
Median type				Nane	Nane		
Median storage veh)							
Upstream signal (m)							
pX, platoon unblocked							
vC, conflicting volume	88	16	13				
vC1, stage 1 confivol							
vC2, stage 2 confivol							
vCu, unblocked vol	88	16	19				
tC, single (s)	6.4	62	4.1				
tC, 2 stage (s)							
IF (s)	3.5	33	22				
bg dnene tree %	8	8	66				
oM capacity (veh/h)	946	1064	1597				
Direction, Lane#	EB 1	NB 1	SB 1				
Volume Total	19	30	19				
Volume Left	92	9	0				
Volume Right	-	0	7				
-SSH	952	1597	1700				
Volume to Capacity	0.0	0.01	00				
Queue Length 95th (m)	0.5	0.2	0.0				
Control Delay (s)	8.9	2.5	0.0				
Lane LOS	V	4					
Approach Delay (s)	8.9	2.5	0.0				
ApproachLOS	∢						
Intersection Summary							
Average Delay			3.6				
Intersection Capacity Utilization	L		18.0%	ō	ICU Level of Service	Service	×
Analysis Period (min)			15				

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osed Residential Development 20 Cairns Crescent.

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<2036 Total> Weekday AM Peak Hour 04-18-2024 HCM Unsignalized Intersection Capacity Analysis 7: Kitchen Road South & Site Access 2

<2036 Total> Weekday PM Peak Hour

HCM Unsignalized Intersection Capacity Analysis

1: Aspdin Road & Highway 11 Southbound Off-Rai

	,	•			•	ř
Movement	盟	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Brid.			4	43	
Traffic Volume (vehh)	Ξ	0	0	7	00	8
Future Volume (Veh/h)	Ξ	0	0	7	œ	8
Sign Control	Stop			Free	Free	
Grade	%0			%	%	
Peak Hour Fador	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	12	0	0	12	6	3
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right furn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	8	9	12			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	8	9	12			
tC, single (s)	6.4	62	4.			
tC, 2 stage (s)						
(F(s)	3.5	33	22			
pg dnene tree %	8	100	100			
cM capacity (veh/h)	990	1071	1607			
Direction, Lane#	EB 1	189	SB 1			
Volume Total	12	15	12			
Volume Left	12	0	0			
Volume Right	0	0	က			
SSH	990	1607	1700			
Volume to Capacity	0.0	0.00	00			
Queue Length 95th (m)	0.3	0.0	0.0			
Control Delay (s)	8.7	0.0	0.0			
Lane LOS	<					
Approach Delay (s)	8.7	0.0	0.0			
Approach LOS	⋖					
IntersectionSummary						
Average Delay			2.2			
Intersection Capacity Utilization			13.3%	0	J Level of	IOU Level of Service
Analysis Period (min)			15			

814 330 6.4 6.2 3.5 3.3 61 68 338 709

WB1 SB1 469 357 0 131 277 226 1700 506 0.28 0.71 0.0 24.4 0.0 27.5 0.0 27.5

814 330

Continuous Persistenti Continuous Persistenti Continuous Persistenti Continuo Persistenti Con

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<2036 Total> Weekday PM Peak Hour HCM Unsignalized Intersection Capacity Analysis 2: Highway 11 Northbound Off-Ramp & Aspdin Road

2. Highway 11 Nothinbound Off-ramp & Aspan Noad	DOG		5	Index.	2		1070110
	1	1	1	ļ	1	•	
Movement	EBT	BB	WBL	WBT	NBL	NBR	
Lane Configurations	2			*	ž		
Traffic Volume (vehfh)	583	202	0	377	24	261	
Future Volume (Veh/h)	589	202	0	37.7	24	261	
Sign Control	Free			Free	Stop		
Grade	%0			%	%		
Peak Hour Factor	0.90	0.90	080	0.90	0.90	0.90	
Hourly flow rate (vph)	321	224	0	419	27	290	
Pedestrians							
Lane Width (m)							
Walking Speed (m/s)							
Percent Blockage							
Right furn flare (veh)							
Median type	None			None			
Median storage veh)							
Upstream signal (m)							
pX, platoon unblocked							
vC, conflicting volume			545		852	433	
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol			545		852	433	
tC, single (s)			4.1		6.5	6.2	
tC, 2 stage (s)							
IF (s)			22		3.6	3.3	
pg dnene tree %			90		95	54	
cM capacity (veh/h)			1024		323	625	
Direction, Lane#	EB 1	WB 1	NB 1				
Volume Total	245	419	317				
Volume Left	0	0	27				
Volume Right	224	0	290				
-KS	1700	1700	579				
Volume to Capacity	0.32	0.25	0.55				
Queue Length 95th (m)	0.0	0.0	26.4				
Control Delay (s)	0.0	0.0	18.5				
Lane LOS			O				
Approach Delay (s)	0.0	0.0	18.5				
Approach LOS			O				
Intersection Summary							
Average Delay			4.6				
Intersection Capacity Utilization	uc		51.7%	₫	ICU Level of Service	Service	ď
Analysis Period (min.)			15				

<2036 Total> Weekday PM Peak Hour

3: Caims Drive & Main Street West	in Stre	et We	est		2	7			received in the		٥	04-18-2024
	4	1	1	1	ļ	1	1	•	4	٨	-	7
Movement	盟	EBT	EBR	WBL	WBT	WBR	NBL	LBA	NBR	SBL	SBT	SBR
Lane Configurations	F	+	K	¥	*		K	t.			4	
Traffic Volume (wehlh)	S	473	74	56	469	-	108	0	53	c)	0	80
Future Volume (Veh/h)	2	473	74	56	469	-	\$	0	ß	2	0	00
Sign Control		Free			Free			Stop			Stop	
Grade		%0			%			%0			%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	514	80	58	510	-	113	0	28	2	0	6
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right furn flare (veh)												
Median type		None			TWLTL							
Median storage veh)					2							
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	211			284			1039	1091	514	1148	1170	510
vC1, stage 1 confivol							524	524		999	999	
vC2, stage 2 confivol							575	267		582	604	
vCu, unblocked vol	511			594			1099	1091	514	1148	1170	510
tC, single (s)	4.1			4.1			7.2	6.5	6.3	7.1	6.5	6.2
IC, 2stage (s)							6.2	5.5		6.1	5.5	
F(s)	2.2			2.2			3.6	4.0	3.4	3.5	4.0	3.3
% eau enenb od	9			6			20	9	88	66	90	86
oM capacity (veh/h)	1054			385			375	336	247	344	372	292
Direction, Lane#	E8 1	E82	EB3	WB 1	WB 2	NB 1	NB 2	88				
Volume Total	9	514	80	28	511	113	99	14				
Volume Left	9	0	0	28	0	113	0	2				
Volume Right	0	0	8	0	-	0	28	6				
-SE	1054	1700	1700	385	1700	375	547	461				
Volume to Capacity	0.00	0.30	0.05	0.03	0.30	0.30	0.11	0.03				
Queue Length 95th (m)	0.1	0.0	0.0	0.7	0.0	10.0	2.8	0.8				
Control Delay (s)	8.4	0.0	0.0	8.7	0.0	18.7	12.4	13.1				
Lane LOS	V.			×,		O	00	00				
Approach Delay (s)	63			0.5		16.5		13.1				
ApproachLOS						ပ		00				
Intersection Summary												
Average Delay			2.5									
Intersection Capacity Utilization	_		44.0%	0	ICU Level of Service	f Service			ĸ			
Analysis Period (min)			15									

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<2036 Total> Weekday PM Peak Hour HCM Unsignalized Intersection Capacity Analysis 4: Cairns Crescent & Cairns Drive

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<2036 Total> Weekday PM Peak Hour HCM Unsignalized Intersection Capacity Analysis 5: Site Access 1 & Cairns Crescent

Independent   EFT   EFR   Will, Will   Miss		Ť	-	-		-		
Manual (valvit)   8	Movement	EBT	EBR	WBL	WBT	NBL	NBR	
Avolame (webs) 8 22 13 6 14 8 8 1 8 1 8 1 8 1 8 1 8 1 8 1 8 1 8	Lane Configurations	43			4	1		
Mount (white) 9 8 2 15 16 14 8 9 14 8 1 14 8	Traffic Volume (vehfh)	œ	8	13	16	7	88	
Proceedings   Proceedings   Process   Proces	Future Volume (Veh/h)	œ	83	13	16	7	80	
Figure 10% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0	Sign Control	Free			Free	Slop		
Parameter   Para	Grade	%			%0	%		
Fater Section 19 24 14 17 15 9 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Morth (m) Morth (m) Morth (m) Morth (m) More (ma) More (	Hourly flow rate (vph)	6	*	7	17	12	6	
Speed (mile)	Pedestrians							
Recognition   Note	Lane Width (m)							
Blockings   Blockings	Walking Speed (m/s)							
Type	Percent Blockage							
None	Right furn flare (veh)							
Makerage with state and with a state and	Median type	None			None			
Control   Cont	Median storage veh)							
The Park Park Park Park Park Park Park Park	Upstream signal (m)							
1999   Company	pX, platoon unblocked							
agapa tominival month with a second month work of the control of t	vC, conflicting volume			33		99	21	
March   Marc	vC1, stage 1 confivol							
1	vC2, stage 2 conf vol							
1	vCu, unblocked vol			33		99	21	
10	fC, single (s)			4.1		6.4	6.2	
1	tC, 2 stage (s)							
1579   1589	IF (s)			2.2		3.5	3.3	
1979   931 1936	% east enemb 0d			66		88	66	
all 25 1 24 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	cM capacity (veh/h)			1579		931	1056	
1 1 23 31 24  11 1 0 1 1 15  11 1 0 1 1 15  11 1 0 1 1 15  11 1 0 1 1 15  11 1 0 1 1 15  11 1 0 1 1 15  11 1 0 1 1 15  11 1 0 1 1 15  11 1 0 1 1 15  11 1 0 1 1 15  11 1 0 1 1 1 15  11 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Direction, Lane#	EB 1	WB1	NB1				
1	Volume Total	33	31	24				
17	Volume Left	0	*	12				
Approximately 1700 1579 974  Approximately 0.02 0.02 0.05  A A A A A A A A A A A A A A A A A A A	Volume Right	24	0	თ				
December   Control   Con	SSH	1700	1579	974				
1979 00 02 0.6 1979 00 03 8.8 1979 00 33 8.8 1989 00 33 8.8 1989 3.8 1989 3.8 1989 3.8 1989 3.8 1989 3.8 1989 3.8 1989 3.8 1989 3.8 1989 3.8 1989 3.8 1989 3.8 1989 3.8 1989 3.8 1989 3.8 1989 3.8 1989 3.8 1989 3.8 1989 3.8	Volume to Capacity	0.02	0.01	0.02				
9.9(s) 0.0 3.3 8.8  A A A A A A A A A A A A A A A A A A A	Queue Length 95th (m)	00	07	9.0				
A A A A A A A A A A A A A A A A A A A	Control Delay (s)	00	3.3	8.8				
00 33 83 8 V 38 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	Lane LOS		۷	۷				
7 36 38 CU Level of Service 15 10 Level of Service	Approach Delay (s)	00	33	8.8				
y 3.6 Ulfization 192% ICU Level of Services 15	ApproachLOS			4				
3.6 Ulirzafon 18.2% ICU Level of Service	Intersection Summary							
Utilization 18.2% ICU Level of Service	Average Delay			3.6				
	Intersection Capacity Utilization	_		18.2%	ಠ	J Level of		
	Analysis Period (min)			15				

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<2036 Total> Weekday PM Peak Hour 04-18-2024 HCM Unsignalized Intersection Capacity Analysis 6: Kitchen Road South & Cairns Crescent

<li>6: Kitchen Road South &amp; Cairns Crescent</li>	il W	airns	resce	Ħ			04-18-2024
	1	1	1	•	<b>→</b>	•	
Movement	188	EBR	NBL	NBT	SBT	SBR	
Lane Configurations	3			v	42		
Fraffic Volume (wehfh)	9	9	13	18	24	2	
Future Volume (Veh/h)	9	9	13	48	54	9	
Sign Control	Stop			Free	Free		
Grade	%0			%	%		
Peak Hour Factor	0.80	0.80	080	0.80	0.80	0.80	
Hourly flow rate (vph)	12	œ	16	22	30	9	
Pedestrians							
Lane Width (m)							
Walking Speed (m/s)							
Percent Blockage							
Right furn flare (veh)							
Median type				None	None		
Median storage veh)							
Jostream signal (m)							
X, platoon unblocked							
.C, conflicting volume	68	83	36				
C1, stage 1 conf vol							
vC2, stage 2 conf vol							
Cu, unblocked vol	87	8	36				
IC, single (s)	6.4	6.2	4				
C, 2 stage (s)							
F(s)	3.5	3.3	22				
p0 queue free %	8	8	8				
cM capacity (veh/h)	910	1046	1588				
Direction, Lane#	E81	NB 1	88 +				
Volume Total	20	38	36				
Volume Left	12	16	0				
Volume Right	00	0	9				
SSH	960	1588	1700				
Volume to Capacity	0.02	0.01	0.02				
Queue Length 95th (m)	0.5	07	0.0				
Control Delay (s)	8.8	3.1	0.0				
Lane LOS	V	¥					
Approach Delay (s)	8.8	3.1	0.0				
Approach LOS	∢						
ntersectionSummary							
Average Delay			3.1				
Intersection Capacity Utilization	5		18.3%	₫	ICU Level of Service	f Service	
Analysis Period (min)			15				

HCM Unsignalized Intersection Capacity Analysis 7: Kitchen Road South & Site Access 2

<2036 Total> Weekday PM Peak Hour

7: Kitchen Road South & Site Access 2	th & S	ite Acc	sess 2			04-18-2024	954
	1	*	1	+	-	•	
Movement	EBI	EBR	NBL	NBT	SBT	SBR	
Lane Configurations	arts.			¥	Ą		
Traffic Volume (vehfh)	9	0	0	25	22	6	
Future Volume (Veh/h)	9	0	0	52	22	6	ì
Sign Control	Stop			Free	Free		
Grade	%			%0	%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	7	0	0	27	24	10	
Pedestrians							
Lane Width (m)							
Walking Speed (m/s)							
Percent Blockage							
Right furn flare (veh)							
Median type				Nane	Nane		
Median storage veh)							
Upstream signal (m)							
pX, platoon unblocked							
vC, conflicting volume	88	83	34				
vC1, stage 1 confivol							
vC2, stage 2 confivol							
vCu, unblocked vol	88	R	34				
tC, single (s)	6.4	6.2	4.1				
IC, 2 stage (s)							
IF (s)	3.5	33	22				ì
% eay enenb pd	8	9	100				
cM capacity (vehifi)	362	1046	1578				
Direction, Lane#	EB 1	NB 1	SB 1				
Volume Total	7	22	35				
Volume Left	7	0	0				
Volume Right	0	0	9				
TS3	962	1578	1700				
Volume to Capacity	0.0	0.0	0.02				ì
Queue Length 95th (m)	05	0.0	0.0				
Control Delay (s)	8.8	0.0	0.0				ì
Lane LOS	¥						
Approach Delay (s)	8.8	0.0	0.0				
ApproachLOS	∢						
Intersection Summary							
Average Delay			6.0				
Intersection Capacity Utilization	_		13.3%	9	CU Level of Service	f Service A	
Analysis Period (min)			15				



# LEVEL OF SERVICE ANALYSIS AT SIGNALIZED INTERSECTIONS

To assist in clarifying the arithmetic analysis associated with traffic engineering, it is often useful to refer to "Level of Service". The term Level of Service implies a qualitative measure of traffic flow at an intersection. It is dependent upon vehicle delay and vehicle queue lengths at the approaches. Specifically, Level of Service criteria are stated in terms of the average stopped delay per vehicle for a 15-minute analysis period. The following table describes the characteristics of each level:

Level of Service	<u>Features</u>	Stopped Delay per Vehicle (sec)
A	At this level of service, almost no signal phase is fully utilized by traffic. Very seldom does a vehicle wait longer than one red indication. The approach appears open, turning movements are easily made and drivers have freedom of operation.	<u>(sec)</u> ≤ 5.0
В	At this level, an occasional signal phase is fully utilized and many phases approach full use. Many drivers begin to feel somewhat restricted within platoons of vehicles approaching the intersection.	$> 5.0$ and $\leq 15.0$
С	At this level, the operation is stable though with more frequent fully utilized signal phases. Drivers feel more restricted and occasionally may have to wait more than one red signal indication, and queues may develop behind turning vehicles. This level is normally employed in urban intersection design.	$> 15.0 \text{ and} \le 25.0$
D	At this level, the motorist experiences increasing restriction and instability of flow. There are substantial delays to approaching vehicles during short peaks within the peak period, but there are enough cycles with lower demand to permit occasional clearance of developing queues and prevent excessive backups.	$> 25.0 \text{ and} \le 40.0$
Е	At this level, capacity is reached. There are long queues of vehicles waiting upstream of the intersection and delays to vehicles may extend to several signal cycles.	> 40.0 and ≤ 60.0
F	At this level, saturation occurs, with vehicle demand exceeding the available capacity.	> 60.0

# LEVEL OF SERVICE ANALYSIS AT UNSIGNALIZED INTERSECTIONS $^{(1)}$

The term "level of service" implies a qualitative measure of traffic flow at an intersection. It is dependent upon the vehicle delay and vehicle queue lengths at approaches. The level of service at unsignalized intersections is often related to the delay accumulated by flows on the minor streets, caused by all other conflicting movements. The following table describes the characteristics of each level.

Level of Service	Features
A	Little or no traffic delay occurs. Approaches appear open, turning movements are easily made, and drivers have freedom of operation.
В	Short traffic delays occur. Many drivers begin to feel somewhat restricted in terms of freedom of operation.
С	Average traffic delays occur. Operations are generally stable, but drivers emerging from the minor street may experience difficulty in completing their movement. This may occasionally impact on the stability of flow on the major street.
D	Long traffic delays occur. Motorists emerging from the minor street experience significant restriction and frustration. Drivers on the major street will experience congestion and delay as drivers emerging from the minor street interfere with the major through movements.
Е	Very long traffic delays occur. Operations approach the capacity of the intersection.
F	Saturation occurs, with vehicle demand exceeding the available capacity. Very long traffic delays occur.

<sup>(1)</sup> Highway Capacity Manual - Special Report No. 209, Transportation Research Board, 1985.





# COMMUNITY PLANNING PERMIT BY-LAW

# **TOWN OF HUNTSVILLE**



PREPARED BY: SGL PLANNING & DESIGN INC. & DILLON CONSULTING



# Table 5 – Parking Requirement Table

Row	Land Use	Minimum number of parking spaces required
i	Dwelling unit (single detached, duplex, semi-detached, <u>street</u> <u>townhouses</u> )	2 parking spaces for each <b>dwelling unit</b> , one of which may be in an enclosed garage
ii	Dwelling unit (multiple dwelling, apartment)	In the Urban Settlement Area, as illustrated on Schedule A of the Official Plan, 1.25 parking spaces for each dwelling unit PLUS 1 space for every 5 units.  1.5 parking spaces for each dwelling unit in all other areas.
iii	Dwelling units in a commercial building; Secondary residential dwelling unit	1 parking space for each <b>dwelling</b> unit.
iv	Residential Care Facility, Hospital	0.33 parking space for each bed or rooming unit.
v	Institutional Uses, Places of assembly, Cinema/Theatre, health services	1 parking spaces for each 25 square metres of floor area OR 1 parking space for each 4 seats in the facility, whichever is the greater.
vi	Bar	1 parking space for each 4 persons that can be accommodated on the premises at one time.
vii	Resort or other accommodation facility; bed and breakfast	1 parking space for each guest room in the facility PLUS 1 parking space per 100 sq. m of gross floor area used for commercial



# Collingwood Zoning By-law 2010-040

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Enactment Date: April 12, 2010 Consolidated: December 4, 2023 Table of Contents

# Collingwood Zoning By-law 2010-040

Table 5.14.8.1 Commercial Vehicle Location

Vehicle Size	Required Location
A length of up to 6.7 m	Permitted in any yard provided that it is
A height of up to 2.2 m	located on a driveway only
A length or height greater than the above	In the rear yard only and no closer than 1.0 m to any lot line and on a driveway only; or alternatively fully enclosed in a building.

# 5.15 Parking Space Requirements

5.15.1 Unless provided elsewhere in this Zoning By-law, the minimum number of required parking spaces for uses, other than those on lands in a C1 zone classification, shall be in accordance with Table 5.15.1.1, entitled Required Parking Spaces.

Table 5.15.1.1 Required Parking Spaces

Type of Use	Parking Space Ratio
Accessory apartment/second unit	1 space
Adult Entertainment Establishment	8 spaces per 100 m <sup>2</sup> GFA
Arena	1 space per 4 seats of fixed seating
Ambulance service	1 space per staff on duty, with no less than 2 spaces
Assembly hall, theatre	1 space per 4 seats of fixed seating, or 1 space per 4 persons of building occupancy where fixed seating is not provided
Dwelling unit in a portion of a non- residential building	1 space per unit
Boarding Home	3 spaces
Community centre	1 space per every 4 person of building occupancy
Composting facility	1 space per 100 m <sup>2</sup> GFA
Dwelling, apartment	space per unit, plus an additional     0.25 spaces per unit for visitor     parking
Day care centre	2 spaces per 100 m <sup>2</sup> GFA
Dwelling, single detached Dwelling, semi-detached Dwelling, duplex Dwelling, townhouse	2 spaces per unit

Section 5: Parking and Loading Provisions



# **TOWN OF GRAVENHURST**

COMPREHENSIVE ZONING BY-LAW

BY-LAW NO. 2010-04









Council Approved: April 20, 2010 OMB Approved: November 28, 2011 (in part)

Updated to: Sept 2023

Source: http://www.seniors.gc.ca/images/upload/gravenh.ir sthomepage/Segwun, and "Wenonah J.jag; http://www.hickerphoto.com/gravenhurs-bepra-house-muskob-andra-1876e-je-dures-htm; http://mdia.photobuckat.com/image/Gravenhurs-ontario-1.jag.



PLANSCAPE
BUILDING COMMUNITY THROUGH PLANNING

Financial Establishment; Business Office; Veterinary Services; or Data Computer, Electric, Processing Business; Surveying, Planning, Engineering, or Design **Business** Funeral Home; Religious Institution

1 space for each 28.0 square metres of the gross leasable floor area which accommodates such use

1 space for each 5 fixed seats or 1 space for each 23.0 square metres of the gross floor area which accommodates such use, whichever results in a greater requirement

Manufacturing

1 space for each 37.0 square metres

of gross floor area

**Health Services** 

1 space per 25.0 square metres of

gross floor area

Motor Vehicle Service Station

1 space for each fuel pump island

Multiple Dwelling

1 space per dwelling unit; plus 1 space for each 4 dwelling units for

visitors only

Place of Assembly

1 space for each 23.0 square metres of the gross floor area which

accommodates such use

Recreational Institution

1 space for each 92.5 square metres of gross floor area which

accommodates such use

Residential Care Facility; Nursing

Home

1 space for each dwelling unit or rooming unit PLUS 1 space per 100.0 square metres of gross floor area used for medical or personal services.

Restaurant

1 space for each 9.0 square metres of the gross leasable floor area which

accommodates such use

Retail Convenience; Beverage Brewing: Beverage Distillation

1 space for each 20.0 square metres of the gross leasable floor area which

accommodates such use

Section 6: Off-Street Parking and Off-Street Loading

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## THE CORPORATION OF THE TOWN OF PARRY SOUND

## BY-LAW NO: 2004-4653

-1-

Being a By-law to regulate the use of land, buildings and structures within the Town of Parry Sound (Comprehensive Zoning By-law)

WHEREAS authority is granted pursuant to Section 34 of The Planning Act, R.S.O. 1990, c. P.13, to Councils of Municipalities to enact By-laws regarding the use and the erection and use of buildings or structures within the municipality;

NOW THEREFORE THE COUNCIL OF THE CORPORATION OF THE TOWN OF PARRY SOUND ENACTS AS FOLLOWS:

- The text and schedules attached hereto are hereby passed as the Zoning By-law for the Town of Parry Sound.
- This By-law shall come into force and take effect upon the final passing thereof pursuant to subsections 34(21) and (30) of the Planning Act, R.S.O. 1990, c. P.13, as amended.

READ a FIRST time this 6th day of Tough, 2004

READ a SECOND and THIRD time, PASSED, SIGNED and SEALED

Certified that the above is a true copy of By-law No. 2004-4653 as enacted and passed by the Council of the Corporation of the Town of Parry Sound on the grad day of Janey , 2004.

Town of Parry Sound Zoning By-law

## (m) Calculation

Where the application of ratios result in a fraction of a *parking space*, the required number of spaces shall be rounded to the next highest whole number.

## (n) Barrier-free Parking

Wherever barrier-free access to a building is required under the *Building Code*, one barrier-free *parking space* shall be provided for every 30 standard *parking spaces* or part thereof and shall be included in the total number of parking spaces required under the Schedule for Parking Requirements.

The provisions for *parking space* requirements shall apply to the uses as set out in the following Schedule: (*Note exemptions for Business Improvement Area in Section 4.30 (j) (i)*.)

## **Schedule for Parking Requirements**

#### 4.31 Parking Requirements (Schedule) MINIMUM NUMBER OF REQUIRED PARKING SPACES Residential: single detached semi-detached or duplex mobile home One (1) space per dwelling unit • converted dwelling · triplex, Residential: · apartment dwellings 1.25 spaces per dwelling unit, 15% of which fourplex shall be dedicated as visitor parking or 1 • row or town house space per dwelling unit if located in the (Any building containing more than two (2) dwelling Business Improvement Area or a units including a mixed use building containing a Commercial (C1) Zone residential use.) 0.25 spaces per dwelling unit Residential: · senior citizen dwelling General business: convenience store, retail store, 5.4 spaces per 100 m2 [1,076.4 ft2] of Gross grocery store, personal service establishment and any Leasable Area (GLA) commercial uses other than those specified. Two (2) spaces for every two washing Laundromat machines or cleaning units 5.4 spaces per 100 m<sup>2</sup> [1,076.4 ft<sup>2</sup>] of Gross **Shopping Centre** Leasable Area (GLA) One (1) space for each five (5) seats capacity Funeral parlour of the chapel with a minimum of ten (10) Offsite Parking - Encumbered parking spaces as per 1 space per encumbered parking space Section 4.30 (j) iv)

File P-985 B6 December 5, 2003 (pg. amended per 2015-6534)



# **Proxy Parking Survey Results**

Site: East Access to 210 Highway 60, Huntsville, Ontario Date: Friday, August 25, 2023, Saturday, August 26, 2023

Time frame: 11:00am to midnight

Parking Supply: 122 spaces

	Observed Pa	arking Demand
Start Time	Friday, August 25, 2023	Saturday, August 26, 2023
11:00	40	75
11:15	44	76
11:30	42	73
11:45	38	69
12:00	42	69
12:15	45	70
12:30	46	71
12:45	46	66
13:00	45	68
13:15	43	65
13:30	43	68
13:45	40	65
14:00	44	67
14:15	46	69
14:30	51	72
14:45	51	71
15:00	47	68
15:15	44	66
15:30	42	62
15:45	42	64
16:00	44	64
16:15	47	64
16:30	48	63
16:45	47	63
17:00	48	65
17:15	50	67
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17:45	53	70
18:00	59	73
18:15	60	72
18:30	63	74
18:45	59	69
19:00	61	72
19:15	67	76
19:30	69	77
19:45	64	75
20:00	65	79
20:15	66	82
20:30	66	85
20:45	67	86
21:00	68	87
21:15	68	86
21:30	69	86
21:45	70	88
22:00	72	91
22:15	72	92
22:30	73	93
22:45	73	93
23:00	74	94
23:15	74	94
23:30	74	94
23:45	73	95





Peer Review Comments





File 425043

May 13, 2025

Kelsea Shadlock Senior Planner Town of Huntsville 37 Main Street East Huntsville, Ontario P1H 1A1 kelsea.shadlock@huntsville.ca

Re: 20 Cairns Crescent, Town of Huntsville

Transportation Study - 1st Submission Peer Review

# Dear Kelsea:

As requested, we have reviewed the *Transportation Study - Proposed Residential Development, 20 Cairns Crescent* prepared by Trans-Plan Transportation Inc. (dated July 2024). We have limited our comments to the local road network, recognizing that MTO will comment on potential impacts to MTO infrastructure. Our peer review comments are provided below.

REPORT REFERENCE	COMMENT
4.1 Road Network	<ul> <li>There are errors in the description of the road network:</li> <li>Main Street West and Aspdin Road are also known as Muskoka Road 3, which is a Class C District Road (arterial) under the jurisdiction of the District Municipality of Muskoka.</li> <li>As per the Town's Official Plan, Kitchen Road South is an urban collector road.</li> <li>This section should include a description of the study area intersections, including lane provision and control.</li> </ul>
4.2 Traffic Counts	The intersection of Kitchen Road South (urban collector) with Main Street West (arterial) should have been included in the study area.
5.1 Horizon Years	As per MTO TIS guidelines and District of Muskoka TIS guidelines, a TIS should include the existing conditions, year of build-out, 5 years and 10 years beyond build-out.
5.2 Background Growth Rate	No supporting background data has been provided to substantiate the 2% background growth rate (i.e. historical population and traffic growth, projected population and employment, etc.). While we do not necessarily disagree with the 2% growth rate applied, without supporting information it can not be confirmed as conservative or appropriate.
5.3 Background Developments	The study notes that there are no planned developments in the surrounding area; however, as per the District's development applications map, there are developments in the area. There are commercial lands on Main Street West opposite







REPORT REFERENCE	COMMENT
	Cairns Drive; and Huntsville Highlands to the south and east of the subject property. Huntsville Highlands abuts the unopened road allowance of Kitchen Road South and thus has the potential to significantly impact the volumes on the study area road network should its construction include extending and connecting Kitchen Road South. The consultant should confirm which background developments in the area should be considered in the study.
5.4 Planned Roadway & Transit Improvements	The 2015 Road Needs Study has been superseded by a newer study. Please refer to the updated study and/or contact the Town regarding planned improvements to the road network. With respect to Main Street West/Aspdin Road, contact the District for planned improvements (if any).
6.2 Trip Distribution & Assignment	The study should provide greater detail with respect to distribution and assignment. (i.e. % of traffic heading N, S, E, W).
	Provide detail as to how assignment to site access points was derived. Given the size and orientation of the surface parking lot, it is expected that a majority of trips heading into Huntsville via Main Street West will use the Kitchen Road South access.
	Given the site access locations and considering the shortest route, it would be expected that all traffic travelling to/from the north along Main Street West would do so via Kitchen Road South. As the site is expected to contribute volumes to the turning movements at the intersection of Kitchen Road South with Main Street West, it would be considered appropriate to include this intersection in the assessment.
	There are trips assigned to Cairns Crescent/Crescent Road, which terminates as a dead end. All trips should be distributed to Main Street West to the south of Cairns Drive.
	There are errors on Figure 6: Site Traffic Assignment. The access on Cairns Crescent illustrates 4 inbound left turns during the AM peak and 13 inbound left turns during the PM peak, but the volumes at Kitchen Road South indicated on 1 trip per peak hour approaching from that direction. Similarly, the there are 13 outbound right turns at the same access during the AM peak but only 11 trips turning left from Cairns Drive to Kitchen Road South.
7 Future Total Traffic Conditions	It is standard practice for a TIS to include an assessment of the year of build-out to establish whether any improvements are required to support the development on completion. The assessment should include the year of build-out or a valid argument as to why the year of build-out was not considered.
	Include the v/c ratios in Table 3 for ease of reference.
9.3 Parking Surveys at Proxy Site	The vacancy at the proxy site should be confirmed (i.e. what is the parking rate per occupied unit).
	Parking justification should be supported by surveys completed at a minimum of 3 proxy sites.
10.1 Site Circulation Review	Swept path assessments for delivery vehicle and waste collection truck show vehicles using full width of driveway (i.e. encroaching into oncoming traffic). Templates should be revisited to avoid encroachment into oncoming site traffic.



REPORT REFERENCE	COMMENT
	Demonstrate that a loading vehicle can reverse into the loading area.
	The parking spaces at the end of the aisles in the parking garage are very tight, with the swept path encroaching on the structural pillars. For the exit movement the vehicle has been placed against the adjacent wall, which is not feasible as the driver would not be able to enter or exit the vehicle. The illustration must demonstrate that use of the parking spaces are feasible. Reversing the vehicle into the space may yield better results.
General Comments	The study should provide a review of the site access point in context of Town/industry standards or requirements including: - access location - design (i.e. width, radii, etc) - corner clearance - clear throat length.
	The sight lines must be assessed along Cairns Crescent and Kitchen Road South at the site access locations. Minimum Stopping Sight Distance as per TAC must be considered for an appropriate design speed (posted + 10 km/h) with consideration for adjustments to account for grade.
	Please provide comment on the condition of Kitchen Road South and its ability to accommodate the additional site traffic – particularly south of Cairns Crescent to the site access. Identify any required improvements to support the development traffic.
	Consideration should be given to how snow clearing operations will work for the south parking aisle as there is no snow storage provided at the end of the aisle and no turn around facility provided.

We recommend the above comments be forwarded to the proponent for consideration and response as necessary.

Should you have any questions or comments regarding our review, please do not hesitate to contact us.

Yours truly,

**Tatham Engineering Limited** 

David Perks M.Sc., PTP

Transportation Planner, Group Leader

DP: dp

I:\2025 Projects\425043 - 20 Cairns Crescent - Huntsville\Documents\Reports\L - Shadlock - 20 Cairns Crescent Transportation Study - 1st Submission Peer Review.docx





Correspondence with Town of Huntsville



# **Routine Disclosure**

From Hailey Gillmor < hailey.gillmor@huntsville.ca>

Date Thu 03/07/2025 22:02

**To** Kim Amande < Kim. Amande@trans-plan.com>

2 attachments (5 MB)

Traffic Impact Study.pdf; 2017 08 29 Traffic Impact Study Update.pdf;

You don't often get email from hailey.gillmor@huntsville.ca. Learn why this is important

Good Morning Kim,

Please find attached Traffic Impact Studies, one is for Suisse Can Holding and the other is for Huntsville Highlands. I unfortunately could not find one for Equity Builders Ltd.

If you haven't already I would also suggest you reach out to the District of Muskoka to see if they have any studies as well.

Thanks,

Hailey Gillmor | Planning Technician Town of Huntsville | Town Hall | 37 Main Street East (705) 789-1751 ext 2405 | 1-888-696-4255 ext 2405 www.huntsville.ca

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**Turning Movement Counts** 



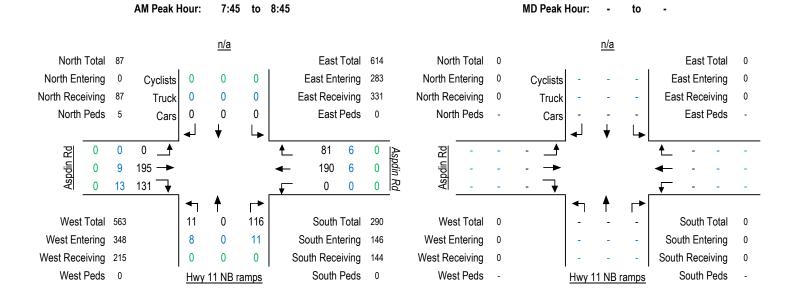


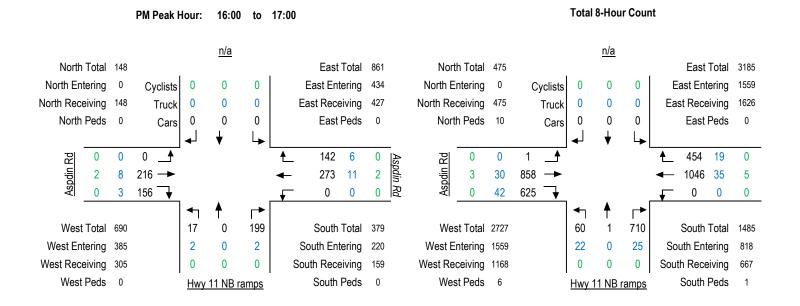
Intersection: Aspdin Road and Highway 11 Northbound Ramps

Municipality: Huntsville, Ontario

Intersection ID:

Date: Friday, August 25, 2023







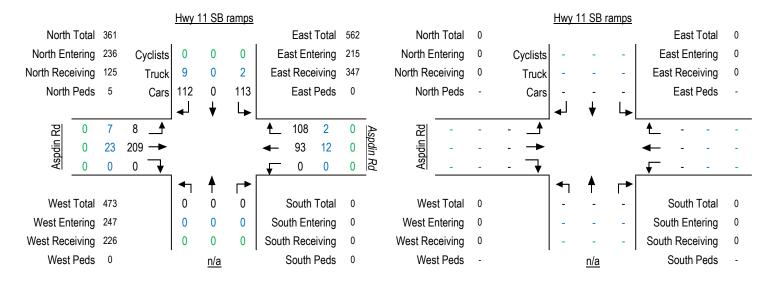


Intersection: Aspdin Road and Highway 11 Southbound Ramps

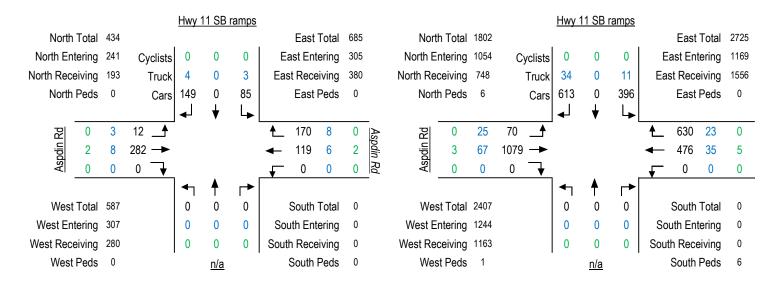
Municipality: Huntsville, Ontario Date: Friday, August 25, 2023

AM Peak Hour: 7:45 to 8:45 MD Peak Hour: - to

Intersection ID:



# PM Peak Hour: 16:00 to 17:00 Total 8-Hour Count







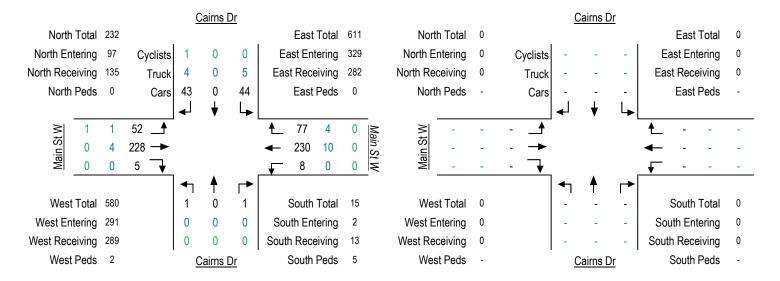
Intersection: Main Street West and Cairns Drive

Municipality: Huntsville, Ontario

Intersection ID:

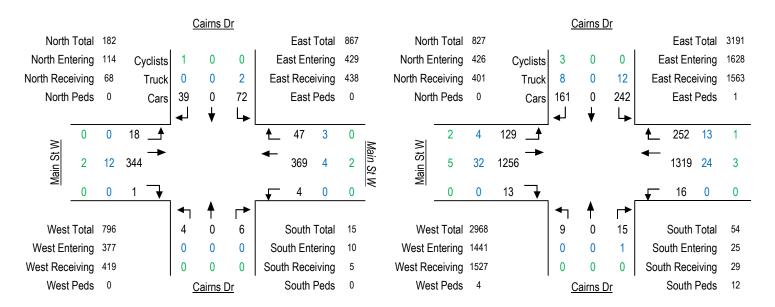
Date: Friday, August 25, 2023

AM Peak Hour: 7:45 to 8:45 MD Peak Hour: - to



# PM Peak Hour: 16:00 to 17:00

# **Total 8-Hour Count**







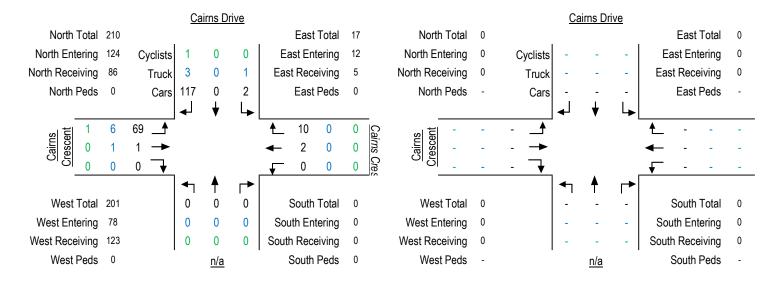
Intersection: Cairns Drive and Cairns Crescent

Municipality: Huntsville, Ontario

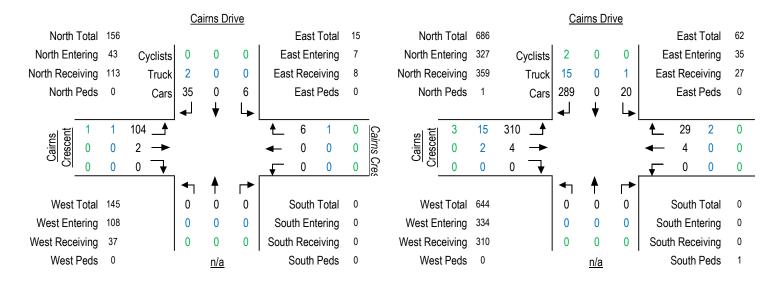
Intersection ID:

Date: Friday, August 25, 2023

AM Peak Hour: 7:45 to 8:45 MD Peak Hour: - to



# PM Peak Hour: 16:15 to 17:15 Total 8-Hour Count







Intersection: Cairns Crescent and Kitchen Road South

Municipality: Huntsville, Ontario

Intersection ID:

Date: Friday, August 25, 2023

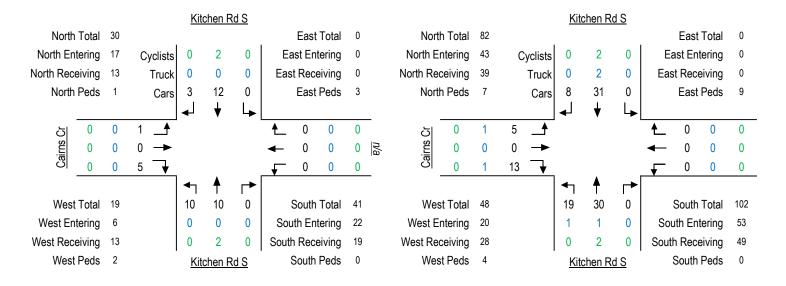
to

MD Peak Hour:

AM Peak Hour: 7:45 to 8:45

Kitchen Rd S Kitchen Rd S North Total 17 East Total 0 North Total 0 East Total 0 0 North Entering Cyclists 0 East Entering North Entering 0 Cyclists East Entering 0 North Receiving 0 East Receiving North Receiving 0 East Receiving Truck Truck North Peds 3 4 0 East Peds 0 North Peds East Peds 4 Cars Cars 0 2 0 Cairns Cr Cairns Cr 0 0 0 0 0 //a 0 0 0 0 0 0 West Total 0 South Total West Total South Total 14 6 5 17 0 0 0 0 0 West Entering South Entering South Entering West Entering 0 0 11 0 0 South Receiving West Receiving South Receiving 6 West Receiving 0 0 West Peds South Peds West Peds South Peds Kitchen Rd S Kitchen Rd S

# PM Peak Hour: 17:00 to 18:00 Total 8-Hour Count







## **Turning Movement Count Diagram**

Intersection: Kitchen Road South and Main Street West

AM Peak Hour: 8:30

to 9:30

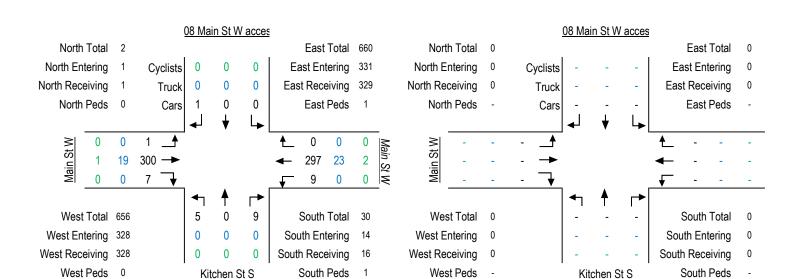
Municipality: Huntsville, Ontario

Intersection ID:

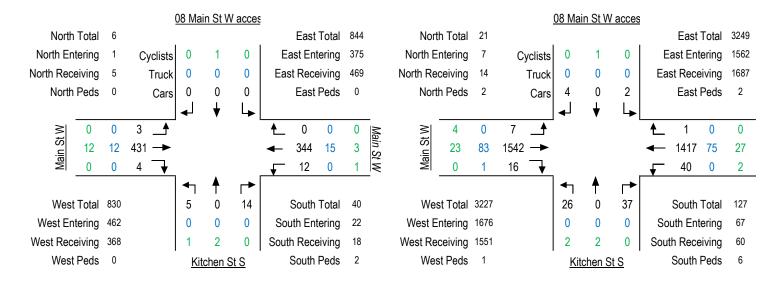
Date: Thursday, July 3, 2025

to

MD Peak Hour:



PM Peak Hour: 16:15 to 17:15 Total 8-Hour Count





## APPENDIX E

Capacity Analysis Results

08/18/2025 <Existing> Weekday AM Peak Hour 1: Aspin Road/Aspdin Road & Highway 11 Southbound On/Off-Ramp HCM Unsignalized Intersection Capacity Analysis

<Existing> Weekday AM Peak Hour

HCM Unsignalized Intersection Capacity Analysis 2: Highway 11 Northbound On/Off-Ramp & Aspdin Road/Main Street West

08/18/2025

SBT

SBL

NBR

EBR

Ť

133

200

116

<del>1</del>20 <del>2</del>2

00

Traffic Volume (veh/h) Future Volume (Veh/h)

Sign Control

Lane Configurations

0.92

0.92 0

0.81

0.81

0.93

0.00

0.88

0.88 0

Peak Hour Factor Hourly flow rate (vph) Pedestrians Lane Width (m) Walking Speed (m/s) Percent Blockage

Stop 0% 0.81

229 229 Free 0% 0.93 246

213 213 Free 0% 0.88 242

Stop 0% 0.0 5 0.0 1.2

	•	†	ļ	1	٠	•	
Movement	田田	EBT	WBT	WBR	SBL	SBR	
Lane Configurations	F	*	*	¥.	>		
Traffic Volume (veh/h)	16.	242	135	115	121	126	
Future Volume (Veh/h)	16	242	135	115	121	126	
Sign Control		Free	Free		Stop		
Grade		%0	%0		%0		
Peak Hour Factor	0.85	0.85	0.94	0.94	69.0	69.0	
Hourly flow rate (vph)	19	285	144	122	175	183	
Pedestrians					2		
Lane Width (m)					3.6		
Walking Speed (m/s)					1.2		
Percent Blockage					0		
Right turn flare (veh)							
Median type		None	None				
Median storage veh)							
Upstream signal (m)							
pX, platoon unblocked							
vC, conflicting volume	149				472	149	
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	149				472	149	
tC, single (s)	4.6				6.5	6.2	
tC, 2 stage (s)							
tF (s)	2.6				3.6	3.3	
p0 queue free %	86				29	80	
cM capacity (veh/h)	1194				531	894	
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1		
Volume Total	19	285	144	122	358		
Volume Left	19	0	0	0	175		
Volume Right	0	0	0	122	183		
cSH	1194	1700	1700	1700	029		
Volume to Capacity	0.02	0.17	0.08	0.07	0.53		
Queue Length 95th (m)	0.4	0.0	0.0	0.0	25.5		
Control Delay (s/veh)	8.1	0.0	0.0	0.0	16.4		
Lane LOS	⋖				ပ		
Approach Delay (s/veh)	0.5		0.0		16.4		
Approach LOS					ပ		
Intersection Summary							
Average Delay			6.5				
Intersection Capacity Utilization			34.4%	ರ	ICU Level of Service	Service	¥
Analysis Period (min)			15				

3.3 100 793

4.0 480

3.5 100 301

3.4

4.0 480

3.9 94 43.1

2.2 100 1336

2.2 100 1326

251 6.2

493

657

242 6.3

493

488

242

251 4.1

Median storage veh)
Upstream signal (m)
Dy plation unblocked
v.c., conflicting volume
v.C., stage 1 conf vol
v.C., stage 2 conf vol
v.C., stage 2 conf vol
v.C., stage (s)
f.C., stage (s)

251

493

657

242

493

488

242

251

None

None

Right turn flare (veh)

Median type

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_	Trans-Plan				

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ICU Level of Service

2.3 28.2% 15

Average Delay Intersection Capacity Utilization Analysis Period (min)

25 25 164 704 0.27 8.7 12.0 B

0.0

0.0

Approach Delay (s/veh) Approach LOS

125 125 1700 0.07 0.0

246 0 0.14 0.0

071 071 0.10 0.10 0.00

0.14

cSH Volume to Capacity Queue Length 95th (m) Control Delay (s/veh) Lane LOS

242

Volume Total Volume Left Volume Right

HCM Unsignalized Intersection Capacity Analysis

3: Cairns Drive & Main Street West

<Existing> Weekday AM Peak Hour

08/18/2025

50 335 3.4 690 635 449 1084 6.5 6.5 7.0 100 319 0.90 635 509 1144 7.2 6.2 3.6 62 260 **8** 8 0.60 45 295 3.3 Stop 0% 0.36 0 5 3.6 1.2 439 683 1122 6.5 6.5 4.0 100 153 99 99 333 333 0.46 18.5 C C C C 1081 439 642 1081 7.1 6.1 3.5 56 284 75 746 0.10 0.10 0.36 ICU Level of Service 0.88 125 0 284 0.44 17.0 27.3 C C 250 250 250 Free 0% 0.88 TWLTL 97 1700 0.22 0.0 2.2 88 1234 151 0 0 0.12 0.12 3.3 8.3 A A 0.80 305 305 121 0.93 1700 0.01 0.00 0.00 7.8 46.8% 15 270 270 Free 0% 0.93 290 3.6 None 290 0 0 0.17 0.0 0.0 t 0.93 2.2 94 1177 72 0 0 1.6 8.3 A A EBL **67** 381 381 ntersection Capacity Utilization Volume to Capacity
Queue Length 95th (m)
Control Delay (s/veh) Lane LOS Approach Delay (s/veh) Approach LOS Lane Configurations Traffic Volume (veh/h) Future Volume (Veh/h) Peak Hour Factor
Hourly flow rate (vph)
Pedestrians
Lane Width (m)
Walking Speed (mis)
Percent Blockage
Right turn flare (veh) Mindian storage veh)
Upstream signal (m)
Dy, platon unblocked
Vc, conflicting volume
VC, stage 2 conf vol
VCL, stage 2 conf vol
VCL, unblocked vol
CC, single (s)
EC, 2 stage (s)
EF (s) p0 queue free % cM capacity (veh/h) ersection Summary Analysis Period (min) Direction, Lane # Volume Total
Volume Left
Volume Right
cSH Median type Sign Control

Proposed Residential Development 20 Cairns Crescent, Huntsville Trans-Plan

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<Existing> Weekday AM Peak Hour 08/18/2025 HCM Unsignalized Intersection Capacity Analysis 4: Cairns Crescent & Cairns Drive

Proposed Residential Development 20 Caims Crescent, Huntsville Trans-Plan

HCM Unsignalized Intersection Capacity Analysis <Existing> Weekday AM Peak Hour 6: Kitchen Road South/Kithcen Road South & Main Street West/Main StreetWest 08/18/2025

372         13         9         431         0         5         0         9         0         0           372         13         9         431         0         5         0         9         0         0           6%         0.78         0.88         0.88         0.88         0.84         0.64         0.64         0.75         0.75         0	<b>↑</b> ■	·	↑ H	<u>► 88</u>	₩ MBL	<b>↓</b> MBT	<b>₩</b>	<b>√</b> Be	<b>←</b> Ma	WBR >	<b>≯</b> Ig	→ SBT	→ SBR
13   9   471   0   5   0   9   0   0     13   9   471   0   5   0   9   0   0     14   10   0   8   0.64   0.64   0.64   0.75   0.75     15   10   8   0.88   0.64   0.64   0.64   0.75   0.75     16   17   10   10   10   11   11     17   10   495   1004   1003   488   1008   1011     18   19   1004   1003   488   1008   1011     19   495   1004   1003   488   1008   1011     10   495   1004   1003   488   1008   1011     10   495   1004   1003   488   1008   1011     10   495   1004   1003   488   1008   1011     10   495   1004   1003   488   1008   1011     10   490   22   1     10   490   22   1     10   490   22   1     10   490   22   1     10   490   22   1     10   490   22   1     10   490   11   1     10   490   12   11     10   490   11   1     10   490   12   11     10   490   11   1     10   490   12   11     10   490   12   11     10   490   10     10   10   11     10   490   10     10   10   10     10   10   10	<b>-</b> c	c.	<b>.</b> 2	5	<b>k</b> -c	<del>4 - </del> <del>7</del> <del>- •</del>	c	L	<b>⊕</b> ⊂	c	c	<b>(</b> * C	•
Free   Stop   O%   O%   O%   O%   O%   O%   O%   O	4 64		372	<u>5</u> £5	ာတ	431	0	വ	0	ာတ	0	0	-
0.78 0.88 0.88 0.64 0.64 0.75 0.75 17 10 495 0.89 0.64 0.64 0.64 0.75 0.75 18.6 1.2 1.2 1.2 19.7 10 495 0.09 100 100 101 10 490 22 1 1 10 490 22 1 1 10 490 22 1 1 10 490 22 1 1 10 490 22 1 1 10 490 22 1 1 10 490 22 1 1 10 490 22 1 1 10 490 22 1 1 10 490 22 1 1 10 490 22 1 1 10 490 22 1 1 10 490 22 1 1 10 490 22 1 1 10 490 22 1 1 10 490 22 1 1 10 490 22 1 1 10 490 22 1 1 10 490 22 1 1 10 8 40 100 100 0 14 1 1 0 0 18 1 0 0 14 1 1 10 10 8 1 0 0 14 1 1 10 10 8 1 10 10 8 1 10 10 8 1 10 10 8 1 10 10 8 1 10 10 8 1 10 10 8 1 10 10 8 1 10 10 8 1 10 10 8 1 10 10 8 1 10 10 8 1 10 10 8 1 10 10 8 1 10 10 8 1 10 10 8 1 10 10 8 1 10 10 8 1 10 10 1 1 1 1	Œ		ee			Free			Stop			Stop	
None			% 6	6	6	%0	9	3	%0	3	1	% }	1
None  495  495  495  496  497  498  498  499  499  499  499  499	0.0		0/:	17	1000	490	00.0	9.0	+ C	14	0.0	0.70	0.73
1.2   1.3   1.2   1.3						-			. —				
None  None  495  495  497  498  498  1004  499  493  493  493  493  493  493						3.6			3.6				
None  495  495  497  498  498  499  499  499  499  499						1.2			1.2				
MB1 WB2 NB1 SB1						0			0				
None  495  495  497  498  498  499  497  498  498  498													
495 1004 1003 488 1008 1011 4 495 493 493 510 510 4 495 493 493 510 510 510 4 495 493 493 510 510 510 4 495 493 493 510 510 510 4 495 493 493 501 498 501 4 4.1 7.1 6.5 6.2 7.1 6.5 6.2 7.1 6.5 6.1 5.5 6.2 7.1 6.5 6.1 5.5 6.	TWLTI	Ε.				None							
495 1004 1003 488 1008 1011 4 1 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1			2										
495													
495 1004 1003 488 1008 1011 495 493 493 501 510 510 510 510 510 510 510 510 510													
493 493 510 510 510 510 510 510 510 510 510 510	490				495			1004	1003	488	1008	1011	490
495   511   510   498   501     411   412   413   414   414     412   413   414   414     413   414   414   414     414   415   415   416     415   416   416   416     416   416   416   416     416   416   416     417   418   419   419     418   419   419     419   429   430   583   420   426     410   490   22   1     410   618   618     410   618     410     410   618     410   618     410   618     410   618     410								493	493		510	510	
495 1004 1003 488 1008 1011 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1								511	510		498	201	
4.1   7.1   6.5   6.2   7.1   6.5     2.2   3.5   6.1   5.5   6.1   5.5     99   98   100   98   100   100     1078   429   429   430   583   420   426   100     10   490   22   1   1   1   1     10   490   22   1   1   1     10   0   14   1   1   1     1078   1700   516   582   1   1     4   0.2   0.04   0.00   0.01   1.1   0.0     8   4   0.0   1.1   0.0   1.1   0.0     8   4   0.0   1.1   0.0   0.0     9   8   8   8   8   8   8   8     0   1   1   1   1   1   1     0   1   1   2   3   3.5   4.20   4.20   4.20     1   2   3   3.5   4.0   4.20   4.20     1   3   4   5   5   5   5   5     1   3   4   5   5   5   5     1   4   5   5   5   5     1   5   6   7   7   7     1   5   7   7   7     1   7   7   7   7     1   7   7   7   7     1   7   7   7   7     1   7   7   7   7     1   7   7   7   7     1   7   7   7   7     1   7   7   7   7     1   7   7   7   7     1   7   7   7     1   7   7   7     1   7   7	490				495			1004	1003	488	1008	1011	490
Second Property of Second Prop	4.1				4.1			7.1	6.5	6.2	7.1	6.5	6.2
22 3.5 4.0 3.3 3.5 4.0 1078								6.1	5.5		6.1	5.5	
99 98 100 98 100 100  WB1 WB2 NB1 SB1 10 490 22 1 10 0 8 0 0 14 1 1078 1700 516 582 0.01 0.29 0.04 0.00 0.2 0.0 12.3 11.2 A B B B 0.2 12.3 11.2 A B B B 0.4 0.0 12.3 11.2 A B B B 0.5 12.3 11.2 A B B B 0.6 12.3 11.2 A B B B B 0.7 12.3 11.2 A B B B B B B B B B B B B B B B B B B B	2.2				2.2			3.5	4.0	3.3	3.5	4.0	3.3
WB1         WB2         NB 1         SB 1         429         430         583         420         426           10         490         22         1 <td>100</td> <td></td> <td></td> <td></td> <td>66</td> <td></td> <td></td> <td>86</td> <td>100</td> <td>86</td> <td>100</td> <td>100</td> <td>100</td>	100				66			86	100	86	100	100	100
WB1 WB2 NB1 SB1  10 490 22 1  10 0 0 14 1  1078 1700 516 582  0.01 0.29 0.04 0.00  0.2 0.0 1.1 0.0  8.4 0.0 1.1 0.0  8.4 0.1 1.2 A  B B  0.2 12.3 11.2  A B B  0.4 0.0 1.3 11.2  A B B  0.5 12.3 11.2  B B  15.3 11.2  A B B  16.4 0.0 1.3 11.2  A B B  17.3 11.2  A B B  18.5 B  18.5 B  19.5	1084				1078			459	430	283	420	426	285
10 490 22 1 10 0 8 0 0 0 14 1 1078 1700 514 582 0.01 0.29 0.04 0.00 0.2 0.0 1.1 0.0 8.4 0.0 12.3 11.2 A B B 0.2 12.3 11.2 B B 0.4 ICU Level of Service	EB 1 EB 2	B 2		WB 1	WB 2	NB 1	SB 1						
10 0 8 0 0 14 1 1078 1700 546 582 0.01 0.29 0.04 0.00 0.2 0.0 1.1 0.0 8.4 0.0 12.3 11.2 A B B 0.2 12.3 11.2 B B 0.4 ICU Level of Service 15		194		10	490	22	1						
1078 1700 516 582 0.01 0.29 0.00 0.2 0.0 1.1 0.00 8.4 0.0 12.3 11.2 A B B 0.2 12.3 11.2 B B 0.4 ICU Level of Service 15	ი	_		19	0	∞	0						
1078 1700 516 582 0.01 0.29 0.04 0.00 0.2 0.0 12.3 11.2 A B B B 0.2 12.3 11.2 B B B 0.4 ICU Level of Service 15		~	7	0	0	4	-						
0.01 0.29 0.04 0.00 0.2 0.0 1.1 0.0 8.4 0.0 12.3 11.2 A B B B 0.2 12.3 11.2 B B B 0.4 ICU Level of Service 15		$\sim$	0	1078	1700	516	285						
0.2 0.0 1.1 0.0 8.4 0.0 12.3 11.2 A B B 0.2 12.3 11.2 B B B 0.4 ICU Level of Service 15		C/i	တ္	0.01	0.29	0.04	0.00						
8.4 0.0 12.3 11.2 A B B B 0.2 12.3 11.2 B B B 0.4 ICU Level of Service 15	0.1 0.	o.	0	0.2	0.0	Ξ:	0.0						
12.3 11.2 B B ICU Level of Service		<u>~</u>	_	8.4	0.0	12.3	11.2						
12.3 11.2 B B B B CU Level of Service	∢			∢		മ	Ω						
B B IS	0.1			0.2		12.3	11.2						
ICU Level of Service						Ф	Ф						
ICU Level of Service													
ICU Level of Service				0.4									
15	ntersection Capacity Utilization		(,)	5.1%	<u>0</u>	U Level o	f Service			∢			
				15									

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HCM Unsignalized Intersection Capacity Analysis 7: Kitchen Road South & Caims Crescent

<Existing> Weekday AM Peak Hour 08/18/2025

	•	~	<	<b>←</b>	<b>→</b>	•	
Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations	Þ			4	£,		
Traffic Volume (veh/h)	4	က	6	9	19	22	
Future Volume (Veh/h)	4	3	6	9	19	5	
Sign Control	Stop			Free	Free		
Grade	%0			%0	%0		
Peak Hour Factor	0.50	0.50	0.65	0.65	09.0	09.0	
Hourly flow rate (vph)	80	9	14	6	32	8	
Pedestrians	4			17	က		
Lane Width (m)	3.6			3.6	3.6		
Walking Speed (m/s)	1.2			1.2	1.2		
Percent Blockage	-			-	0		
Right turn flare (veh)							
Median type				None	None		
Median storage veh)							
Upstream signal (m)							
pX, platoon unblocked							
vC, conflicting volume	06	29	24				
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	06	29	24				
tC, single (s)	6.4	7.2	4.1				
tC, 2 stage (s)							
tF(s)	3.5	4.2	2.2				
p0 queue free %	66	66	66				
cM capacity (veh/h)	887	759	1546				
Direction, Lane #	EB 1	NB 1	SB 1				
Volume Total	14	23	40				
Volume Left	∞	14	0				
Volume Right	9	0	∞				
cSH	827	1546	1700				
Volume to Capacity	0.02	0.01	0.02				
Queue Length 95th (m)	0.4	0.2	0.0				
Control Delay (s/veh)	9.4	4.5	0.0				
Lane LOS	⋖	∢					
Approach Delay (s/veh)	9.4	4.5	0.0				
Approach LOS	∢						
Intersection Summary							
Average Delay			3.1				
Intersection Capacity Utilization			21.8%	<u> </u>	ICLI Level of Service	Service	A
Analysis Period (min)			15	2			
/ (p			•				

Proposed Residential Development 20 Cairns Crescent, Huntsville Trans-Plan

HCM Unsignalized Intersection Capacity Analysis <a href="certific">CExisting> Weekday PM Peak Hour 1: Aspin Road/Aspdin Road & Highway 11 Southbound Off-Ramp 08/18/2025</a>

HCM Unsignalized Intersection Capacity Analysis <Existing> Weekday PM Peak Hour 2: Highway 11 Northbound Off-Ramp & Aspdin Road/Main Street West 08/18/2025

																																								∢	
*	SBR		160	160			0.91	176										184			184	6.2		3.3	79	856														Service	
ا د	WBR SBL	X-	186 92		Stop		0.87 0.91	214 101										632			632	6.4		3.5	11	436	3.2 SB 1		0 101		1700 633		17.8	0.0 15.0	ပ	15.0	ပ			ICU Level of Service	
<b>+</b>	WBT WE		160 1		Free		0.87 0.8							None													WB1 WB2	184 2	0		1700 17		0.0			0.0			3.9	38.1%	15
†	EBT		313		Free	%0	Ī	406						None													EB 2	4	0		Ì	_	0.0								
1	EBL	-	16	16			0.77	21										184			184	4.3		2.4	86	1290	EB 1	21	21	0	1290	0.02	0.4	7.8	⋖	0.4				zation	
	Movement	Lane Configurations	Traffic Volume (veh/h)	Future Volume (Veh/h)	Sign Control	Grade	Peak Hour Factor	Hourly flow rate (vph)	Pedestrians	Lane Width (m)	Walking Speed (m/s)	Percent Blockage	Right turn flare (veh)	Median type	Median storage veh)	Upstream signal (m)	pX, platoon unblocked	vC, conflicting volume	vC1, stage 1 conf vol	vC2, stage 2 conf vol	vCu, unblocked vol	tC, single (s)	tC, 2 stage (s)	tF (s)	p0 queue free %	cM capacity (veh/h)	Direction, Lane #	Volume Total	Volume Left	Volume Right	SSH	Volume to Capacity	Queue Length 95th (m)	Control Delay (s/veh)	Lane LOS	Approach Delay (s/veh)	Approach LOS	Intersection Summary	Average Delay	Intersection Capacity Utilization	Analysis Period (min)

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	1	†	<i>&gt;</i>	<b>&gt;</b>	ţ	✓	•	<b>←</b>	•	٠	<b>→</b>	•
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		*	¥.		*	ĸ.		Þ				
Traffic Volume (veh/h)	0	239	166	0	325	182	20	0	210	0	0	0
Future Volume (Veh/h)	0	239	166	0	325	182	50	0	210	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		%0			%0			%0			%0	
Peak Hour Factor	0.83	0.83	0.83	0.89	0.89	0.89	0.83	0.83	0.83	0.92	0.92	0.92
Hourly flow rate (vph)	0	288	200	0	365	204	24	0	253	0	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	365			288			653	653	288	906	653	365
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	365			288			653	653	788	906	653	365
tC, single (s)	4.1			4.1			7.2	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			93	100	99	100	100	100
cM capacity (veh/h)	1205			1286			368	389	753	172	386	989
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1							
Volume Total	288	200	365	204	277							
Volume Left	0	0	0	0	54							
Volume Right	0	200	0	504	253							
CSH	1700	1700	1700	1700	691							
Volume to Capacity	0.17	0.12	0.21	0.12	0.40							
Queue Length 95th (m)	0.0	0.0	0.0	0.0	15.5							
Control Delay (s/veh)	0.0	0.0	0.0	0.0	13.7							
Lane LOS					ш							
Approach Delay (s/veh)	0.0		0.0		13.7							
Approach LOS					В							
Intersection Summary												
Average Delay			2.8									
Intersection Capacity Utilization	uo		37.9%	<u>0</u>	ICU Level of Service	f Service			∢			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis 3: Cairns Drive & Main Street West

<existing> Weekday PM Peak Hour</existing>	100000

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- Albert 197 Woohday Five Foak Float	08/18/2025	
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			٠				-	-				
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	r	*	¥.	K	£,		r	£,			4	
Traffic Volume (veh/h)	19	425	2	- 14	391	23	26	.0	92	11	.0	58
Future Volume (Veh/h)	19	425	ည	41	391	23	26	0	92	11	0	28
Sign Control		Free			Free			Stop			Stop	
Grade		%0			%0			%0			%0	
Peak Hour Factor	0.85	0.85	0.85	0.92	0.92	0.92	0.70	0.70	0.70	0.85	0.85	0.85
Hourly flow rate (vph)	22	200	9	45	425	28	84	0	83	91	0	88
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			TWLTL							
Median storage veh)					2							
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	483			206			1127	1117	200	1181	1094	454
vC1, stage 1 conf vol							244	544		544	244	
vC2, stage 2 conf vol							583	573		637	220	
vCu, unblocked vol	483			206			1127	1117	200	1181	1094	454
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
F (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	86			96			75	100	84	20	100	83
cM capacity (veh/h)	1090			1069			341	380	575	536	379	604
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1	NB 2	SB 1				
Volume Total	22	200	9	45	483	84	93	159				
Volume Left	75	0	0	42	0	84	0	99				
Volume Right	0	0	9	0	28	0	93	89				
SSH	1090	1700	1700	1069	1700	341	575	381				
Volume to Capacity	0.02	0.29	0.00	0.04	0.28	0.25	0.16	0.42				
Queue Length 95th (m)	0.5	0.0	0.0	=	0.0	9.7	4.6	16.0				
Control Delay (s/veh)	8.4	0.0	0.0	8.5	0.0	19.0	12.5	21.0				
Lane LOS	∢			∢		ပ	В	ပ				
Approach Delay (s/veh)	0.3			0.7		15.5		21.0				
Approach LOS						ပ		O				
Intersection Summary												
Average Delay			4.8									
Intersection Capacity Utilization	5		51.6%	<u>0</u>	ICU Level of Service	f Service			⋖			

Proposed Residential Development 20 Cairns Crescent, Huntsville Trans-Plan

Synchro 12 Report Page 3

<Existing> Weekday PM Peak Hour 08/18/2025 HCM Unsignalized Intersection Capacity Analysis 4: Cairns Crescent & Cairns Drive

Movement   EBL   EBT   WBR   SBL   SBR		1	<b>†</b>	ţ	4	٠	•	
Configurations (4) 11 3 3 13 7 39  Volume (vehih) 111 3 3 13 7 39  Volume (vehih) 111 3 13 7 39  Volume (vehih) 111 3 13 7 39  Volume (vehih) 1139 4 3 15 8 45  Volume (vehih) 139 4 3 15 8 33  Volume (vehih) 139 6 8 96  Volume (vehih) 1605 632 1077  Volume (vehih) 1605 770 973  Volume (vehih) 1605 1700 973  Volume (vehih) 160	Movement	EBF	EBT	WBT	WBR	SBL	SBR	
Volume (verlift)	Lane Configurations		4	2		Þ		
s Volume (Veh/h) 111 3 3 13 7 39  Sortiol 6 Free Free Stop 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0%	Traffic Volume (veh/h)	11	က	<u>.</u> m	13		39	
Control         Free Free Stop         Stop           Fueu Factor         0.86 0.86 0.86 0.86 0.86 0.86 0.86 0.86	Future Volume (Veh/h)	11	က	က	13	7	39	
transport of the Particle of See of the Particle of the Partic	Sign Control		Free	Free		Stop		
Hour Factor 0.80 0.88 0.88 0.86 0.86  Hour tale (rph) 139 4 3 15 8 45  Arithans  Avidith (m)  g Speed (mis)  It Blocksge Itm flacksge I	Grade		%0	%0		%0		
The mate (vph)   139	Peak Hour Factor	0.80	0.80	0.88	0.88	0.86	0.86	
intigrans  figure (mis)  figur	Hourly flow rate (vph)	139	4	က	15	∞	45	
Width (m)           Vidth (m)           Vidth (m)           At Bocksage           Int Blocksage           In storage veh)           In storage veh           In storage veh      <	Pedestrians							
ig Speed (m/s)           it Blockage           turn flare (veh)         None         None           n type         None         None           aem signal (in)         293         11           atom unblocked         4.1         6.4         6.2           atom viol         4.1         6.4         6.2           itage 1 conf vol         4.1         6.4         6.2           inblocked vol         4.1         6.4         6.2           inplocked vol         4.1         6.4         6.2           pacility (vehlh)         1605         8	Lane Width (m)							
nt Blockage nt blockage nt with faire (veh) n storage veh) sem signal (m) sem sig	Walking Speed (m/s)							
turn flare (veh)         None         None           n storage veh)         None         None           n storage veh)         293         11           n storage veh)         293         11           n flicting volume         18         293         11           n flicting volume         18         293         11           n flicting volume         18         293         11           n flock or vol         4.1         6.4         6.2           n floge (s)         4.1         6.4         6.2           n floge (s)         4.1         6.4         6.2           n floge (s)         2.2         3.5         3.3           n floge (s)         2.2         3.5         3.5           n floge (s)         2.2         4.1         4.1 <td>Percent Blockage</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	Percent Blockage							
n type not storage veh)  attorn signal (m)  attorn unblocked  nuflicting volume 18 293 11  tagge 1 conf vol 18 293 11  tagge 2 conf vol 18 293 11  tagge 2 conf vol 18 293 11  tagge 2 conf vol 3 3.5 3.3  ane free % 91 99 96  pacity (veh/h) 1605 89 96  pacity (veh/h) 1605 89 88  te Leff 139 0 8 88  te Leff 139 0 8 88  te Left 139 0 0.01 0.05  act Capacity (veh/h) 7.3 0.0 8.9  act Delay (sveh) 7.3 0.0 8.9  act LOS A A A  act Delay (sveh) 7.3 0.0 8.9  act LOS A A A  act Delay (sveh) 7.3 0.0 8.9  act LOS A A A  act Delay (sveh) 7.3 0.0 8.9  act LOS A A A  act Delay (sveh) 7.3 0.0 8.9  act LOS A A A  act Delay (sveh) 7.3 0.0 8.9  act LOS A A A  act Delay (sveh) 7.3 0.0 8.9  act LOS A A A  act Delay (sveh) 7.3 0.0 8.9  act LOS A A A  act Delay (sveh) 7.3 0.0 8.9  action Summary 7.1 CU Level of Service  sis Period (min) 15	Right turn flare (veh)							
n storage veh) atom unblocked atom u	Median type		None	None				
barn signal (m)  ataga t conf vol  taga	Median storage veh)							
atoon unblocked  atogs 1 control of tage 2 control vol  atage 3 11  6.4 6.2  3.5 3.3  ane free % 91  99 96  pacity (verhr) 1605  aterior 2 atage 3 1077  aterior 2 atage 3 1077  action Capacity 1605  A A A  act Delay (siveh) 7.3 0.0 8.9  action Summary  7.1 CU Level of Service  sis Period (min)  15	Upstream signal (m)							
Inflicting volume 18 293 11  Itage 2 conf vol 18 293 11  Itage 2 conf vol 18 293 11  Itage (s) 4.1 6.4 6.2  Itage (s) 2.2 3.3  Itage (s) 2.2 3.3  Itage (s) 2.2 3.3  Itage (s) 2.2 3.3  Itage (s) 4.4  It	pX, platoon unblocked							
tage 1 conf vol misses to conf v	vC, conflicting volume	18				293	11	
tiage 2 conf vol michocked vol 18 293 11 64 6.2  4.1 6.4 6.2  4.1 6.4 6.2  4.2 3.3 11 6.6  2.2 3.5 3.3  2.2 3.5 3.3  2.2 3.6 3.3  2.2 3.6 3.3  2.2 3.6 3.3  2.2 3.6 3.3  2.2 3.6 3.3  2.2 3.6 3.3  2.2 3.6 3.3  2.2 3.6 3.3  2.2 3.6 3.4  2.3 0.0 15 45  2.4 5.6 8.9  2.5 3.0 1.4  2.6 0.1 0.05  2.7 8.9  2.8 A A A A A A A A A A A A A A A A A A A	vC1, stage 1 conf vol							
rublocked vol 18 293 11 gigle (s) 4.1 6.4 6.2 stage (s) 2.2 3.5 3.3 sue free % 91 99 96 pacity (verhit) 1605 83 1077 ion_Lane # EB1 WB1 SB1 632 1077 ion_Lane # B1 WB1 SB1 632 1077 ion_Lane # B1 WB1 SB1 632 1077 ion_Lane # B1 WB1 SB1 632 1077 ion_Lane # B2	vC2, stage 2 conf vol							
gige (s)         4.1         6.4         6.2           stage (s)         2.2         3.5         3.3           aue free %         91         99         96           pacity (veh/h)         1605         8         1077           ion, Lane #         EB 1         WB 1         SB 1         632         1077           ion, Lane #         EB 1         WB 1         SB 1         632         1077           ion, Lane #         EB 1         WB 1         SB 3         1077           ie Lotal         143         18         53         6           ie Right         1605         1700         973         8           ie Length 95th (m)         2.3         0.0         1.4         8           Length 95th (m)         2.3         0.0         1.4         A           Ach Delay (sveh)         7.3         0.0         8.9         A           action Summary         7.3         0.0         8.9         A           action Summary         7.1         CU Level of Service           general of Minization         7.3         7.1         CU Level of Service	vCu, unblocked vol	18				293	7	
stage (s)         2.2         3.5         3.3           aue free %         9.1         99         96           pacify (vehlh)         1605         8         99         96           pacify (vehlh)         1605         8         1777           ion, Lane #         EB 1         WB 1         SB 1         8           ie Left         143         18         53         8           ie Left         139         0         8         8           ie Right         150         873         8         8           ie Length 95th (m)         2.3         0.0         1.4         8           J Delay (siveh)         7.3         0.0         8.9         8           ach LOS         A         A         A         A           acition Summary         7.3         CO	tC, single (s)	4.1				6.4	6.2	
2.2 3.5 3.3  sale free % 91 91 99 96  pacity (verl/h) 1602 632 1077  fon, Lane # EB1 WB 1 SB 1 632 1077  for I Left 139 0 8 8  te Left 139 0 8 8  te Right 1605 1700 973  te Capacity (a Capacity 0.09 0.01 0.05  ach Delay (siveh) 7.3 0.0 8.9  ach Delay (siveh) 7.3 0.0 8.9  ach Delay (siveh) 7.3 0.0 8.9  action Summary 7.3 0.0 8.9  action Capacity Utilization 15 30.0 8.9  A A A A A A A A A A A A A A A A A A A	tC, 2 stage (s)							
1605 177  EB 1 WB 1 SB 1  143 18 53  139 0 8  0 15 45  1605 1700 973  0.09 0.01 0.05  2.3 0.0 8.9  A A A  7.3 0.0 8.9  A A A  7.3 0.0 8.9  A A A  7.3 1.0 8.9	tF (s)	2.2				3.5	3.3	
1605 632 1077  EB 1 WB 1 SB 1  143 18 53  139 0 8  0 15 45  1605 1700 973  0.09 0.01 0.05  2.3 0.0 1.4  7.3 0.0 8.9  A A A  7.3 0.0 8.9  7.3 1.0 8.9  7.1 ICU Level of Service  15 15	p0 queue free %	91				66	96	
EB1 WB1 SB1  143 18 53  139 0 8  0 15 45  1605 1700 973  0.09 0.01 0.05  2.3 0.0 1.4  7.3 0.0 8.9  A A A  7.3 0.0 8.9  7.3 1.0 8.9  7.3 1.0 8.9  7.1 CU Level of Service  15	cM capacity (veh/h)	1605				632	1077	
143 18 53 139 0 8 0 15 45 1605 1700 973 0.09 0.01 0.05 2.3 0.0 14 7.3 0.0 8.9 A A A 7.3 0.0 8.9 A A A 7.3 1.0 8.9 7.3 1.0 8.9 7.3 1.0 8.9 7.1 1.0 Level of Service	Direction, Lane #	EB 1	WB 1	SB 1				
139 0 8 0 15 45 1605 1700 973 0.09 0.01 0.05 2.3 0.0 1.4 7.3 0.0 8.9 A A A A 7.3 0.0 8.9 7.3 1.0 8.9 A 1.4 7.3 1.0 8.9 A 1.4 7.3 1.0 8.9	Volume Total	143	18	53				
1605 1700 973 1605 1700 973 0.09 0.01 0.05 2.3 0.0 14 7.3 0.0 8.9 A A A A 7.3 0.0 8.9 7.3 1.0 8.9 A A A A A A A A A A A A A A A A A A A	Volume Left	139	0	∞				
1605 1700 973 0.09 0.01 0.05 2.3 0.0 8.9 A A A 7.3 0.0 8.9 A A 7.1 CU Level of Service 15	Volume Right	0	15	45				
0.09 0.01 0.05 2.3 0.0 1.4 7.3 0.0 8.9 7.3 0.0 8.9 7.3 1.0 8.9 7.1 CU Level of Service 15	cSH	1605	1700	973				
2.3 0.0 1.4 7.3 0.0 8.9 A A 7.3 0.0 8.9 A A A A A 1.1 11cation	Volume to Capacity	0.09	0.01	0.05				
7.3 0.0 8.9 A A 7.3 0.0 8.9 A A Ilization	Queue Length 95th (m)	2.3	0.0	4.				
A A A 7.3 0.0 8.9 A A A A A A A A A A A A A A A A A A A	Control Delay (s/veh)	7.3	0.0	8.9				
7.3 0.0 8.9 A 7.1 Ilization 23.0% ICU Level of Service 15	Lane LOS	∢		∢				
A mnary 7.1 7.1 ICU Level of Service (min) 15	Approach Delay (s/veh)	7.3	0.0	8.9				
7.1 T.1 ICU Level of Service 15	Approach LOS			∢				
7.1 Utilization 23.0% ICU Level of Service 15	Intersection Summary							
Utilization 23.0% ICU Level of Service 15	Average Delay			7.1				
15	Intersection Capacity Utilizat	tion		23.0%	<u> </u>	J Level o	Service	∢
	Analysis Period (min)			15				

Proposed Residential Development 20 Caims Crescent, Huntsville Trans-Plan

HCM Unsignalized Intersection Capacity Analysis <Existing> Weekday PM Peak Hour 6: Kitchen Road South/Kithcen Road South & Main Street West/Main StreetWest 08/18/2025

Movement Lane Configurations Traffic Volume (veh/h) Sign Control												
Lane Configurations Traffic Volume (veh/h) Future Volume (Veh/h) Sign Control	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (veh/h) Future Volume (Veh/h) Sign Control	K	4		×	*			4			2	
Future Volume (Veh/h) Sign Control	9	531	7	13	458	0	9	5.	14	0	-	0
Sign Control	9	531	7	13	458	0	9	7	14	0	-	0
Grade		Free			Free			Stop			Stop	
		%0			%0			%0			%0	
Peak Hour Factor	0.88	0.88	0.88	0.93	0.93	0.93	0.50	0.50	0.50	0.38	0.38	0.38
Hourly flow rate (vph)	7	603	80	14	492	0	12	4	28	0	က	0
Pedestrians								2				
Lane Width (m)								3.6				
Walking Speed (m/s)								1.2				
Percent Blockage								0				
Right turn flare (veh)												
Median type	_	TWLTL			None							
Median storage veh)		7										
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	492			613			1145	1143	609	1167	1147	492
vC1, stage 1 conf vol							623	623		250	250	
vC2, stage 2 conf vol							522	520		647	627	
vCu, unblocked vol	492			613			1145	1143	609	1167	1147	492
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	66			66			97	66	94	100	66	100
cM capacity (veh/h)	1082			974			379	388	498	352	383	281
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	7	611	14	492	44	3						
Volume Left	7	0	14	0	12	0						
ne Right	0	∞	0	0	78	0						
	1082	1700	974	1700	448	383						
	0.01	0.36	0.01	0.29	0.10	0.01						
Queue Length 95th (m)	0.2	0.0	0.3	0.0	2.6	0.2						
Control Delay (s/veh)	8.3	0.0	8.7	0.0	13.9	14.5						
Lane LOS	⋖		⋖		മ	ш						
Approach Delay (s/veh)	0.1		0.2		13.9	14.5						
Approach LOS					Ф	Ф						
Intersection Summary												
Average Delay			0.7									
Intersection Capacity Utilization			41.8%	ਠ	ICU Level of Service	f Service			∢			
Analysis Period (min)			15									

Proposed Residential Development 20 Cairns Crescent, Huntsville Synct Trans-Plan

Synchro 12 Report Page 5

HCM Unsignalized Intersection Capacity Analysis <Existing> Weekday PM Peak Hour 7: Kitchen Road South & Caims Crescent 08/18/2025

Aovement	<b>→</b> ■	<b>№</b> 88	<b>√</b> BH	<b>←</b> MBT	→ SBT	SBR	
ane Configurations	>			₩.	4		
Traffic Volume (veh/h)	2 6	യ ഗ	တ တ	တ တ	<u>∞</u> ≪	വവ	
Sign Control	Stop	,	•	Free	Free	,	
Grade	%0			%0	%0		
Peak Hour Factor	0.50	0.50	0.69	69.0	0.75	0.75	
Hourly flow rate (vph)	4	12	13	13	24	7	
Pedestrians	2				_		
-ane Width (m)	3.6				3.6		
Nalking Speed (m/s)	1.2				1.2		
Percent Blockage	0				0		
Right turn flare (veh)							
Median type				None	None		
Median storage veh)							
Jpstream signal (m)							
X, platoon unblocked							
vC, conflicting volume	20	30	33				
/C1, stage 1 conf vol							
/C2, stage 2 conf vol							
'Cu, unblocked vol	2	30	33				
.C, single (s)	6.4	6.2	4.1				
C, 2 stage (s)							
tF (s)	3.5	3.3	2.2				
p0 queue free %	9	66	66				
cM capacity (veh/h)	930	1049	1589				
Direction, Lane #	EB 1	NB 1	SB 1				
/olume Total	16	56	31				
/olume Left	4	13	0				
/olume Right	15	0	7				
SSH	1017	1589	1700				
Volume to Capacity	0.02	0.01	0.02				
Queue Length 95th (m)	0.4	0.2	0.0				
Control Delay (s/veh)	8.6	3.7	0.0				
-ane LOS	∢	∢					
roach Delay (s/veh)	9.8	3.7	0.0				
Approach LOS	A						
ntersection Summary							
Average Delay			3.2				
ntersection Capacity Utilization	E		17.6%	0	U Level o	ICU Level of Service	∢
Analysis Period (min)			15				

Proposed Residential Development 20 Cairns Crescent, Huntsville Trans-Plan

HCM Unsignalized Intersection Capacity Analysis<2028 Background> Weekday AM Peak Hour 08/18/2025 1: Aspin Road/Aspdin Road & Highway 11 Southbound On/Off-Ramp

HCM Unsignalized Intersection Capacity Analysis<2028 Background> Weekday AM Peak Hour

2: Highway 11 Northbound On/Off-Ramp & Aspdin Road/Main Street West

08/18/2025

SBT

SBL

NBR

BE

WBR

EBR

/

Ť

176

22

146 146

-9 19 19 19

00

Future Volume (Veh/h) raffic Volume (veh/h)

Sign Control

Lane Configurations

0.92

0.92 0

0.81

0.81

0.93

0.00

0.88

0.88 0

Peak Hour Factor Hourly flow rate (vph) Pedestrians

Lane Width (m)
Walking Speed (m/s)
Percent Blockage

Right turn flare (veh)

Median type

0.0

Stop 0% 0.92

Stop 0% 0.81

279 279 Free 0% 0.93

317 317 Free 0% 0.88 360

																																						*	A
*	SBR		134	134			69.0	194										182			182	6.2		3.3	77	857													Service
٠	SBL	>	149	149	Stop	%0	69.0	216	2	3.6	1.2	0						209			209	6.5		3.6	21	442	SB 1	410	216	194	573	0.72	25.5	S. C	25.5	٥			CU Level of Service
4	WBR	R.	136	136			0.94	145																			WB 2	145	0	145	1700	0.09	0.0	2.				2	_
ţ	WBT	*	166	166	Free	%0	0.94	177						None													WB 1	177	0	0	1700	0.10	0.0	2.	0.0			9.3	40.3%
†	EBT	*	327	327	Free	%0	0.85	382						None													EB2	385	0	0	1700	0.23	0.0	2.					
1	EB	×	17	17			0.85	20										182			182	4.6		2.6	86	1158	EB 1	20	70	0	1158	0.02	4.0	2.0 A	4.0				ation
	Movement	Lane Configurations	Traffic Volume (veh/h)	Future Volume (Veh/h)	Sign Control	Grade	Peak Hour Factor	Hourly flow rate (vph)	Pedestrians	Lane Width (m)	Walking Speed (m/s)	Percent Blockage	Right turn flare (veh)	Median type	Median storage veh)	Upstream signal (m)	pX, platoon unblocked	vC, conflicting volume	vC1, stage 1 conf vol	vC2, stage 2 conf vol	vCu, unblocked vol	tC, single (s)	tC, 2 stage (s)	tF (s)	p0 queue free %	cM capacity (veh/h)	Direction, Lane #	Volume Total	Volume Left	Volume Right	SSH	Volume to Capacity	Queue Lerigiri 95iri (m)	Collida Delay (3/verr)	Approach Delay (s/veh)	Approach LOS	Intersection Summary	Average Delay	Intersection Capacity Utilization

305

665

882

390

999

999

360

305

Median storage veh)
Upstream signal (m)
pX, platron unblocked
vC, conflicting volume
vC1, stage 1 conf vol
vC2, stage 2 conf vol
vCu, unblocked vol

None

None

305

6.5

882

360

6.5

660

360

305

3.3

383

3.5 100 182

3.4 68 669

4.0 100 383

3.9 92 327

2.2 100 1210

2.2 100 1267

tC, single (s)
tC, 2 stage (s)
tF (s)
p0 queue free %
cM capacity (veh/h)

Synchro 12 Report Page 1 Proposed Residential Development 20 Cairns Crescent, Huntsville Trans-Plan

Proposed Residential Development 20 Cairns Crescent, Hunt France-Plan
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12 Report	Page 2
Synchro	

⋖

ICU Level of Service

3.0 35.4% 15

Intersection Capacity Utilization Analysis Period (min)

244 27 217 600 0.41 15.8 15.1 C

0.09 0.09 0.0

0.0 0.18 0.0 0.0

0.0 0.0 0.0 0.0

0.21 0.21 0.0

cSH Volume to Capacity Queue Length 95th (m) Control Delay (s/veh)

0.0

0.0

Approach Delay (s/veh) Approach LOS

157

360

Volume Total Volume Left Volume Right

tial Develc	Proposed Residential Development 20 Cairns Crescent, Huntsville	
	tial Develop	
	roposed	rans-Pla

HCM Unsignalized Intersection Capacity Analysis<2028 Background> Weekday AM Peak Hour 3: Cairns Drive & Main Street West

HCM Unsignalized Intersection Capacity Analysis<2028 Background> Weekday AM Peak Hour ا مربت کیمیمیٹ ، کیمینی میں 18/2025

SBR 134 0.82

0.60

Free 0% 0.60 7

Free 0% 0.93 4

0.93

Peak Hour Factor
Hourly flow rate (vph)
Pedestrians
Lane Width (m)
Walking Speed (m/s)
Percent Blockage
Right turn flare (veh)

Stop 0% 0.82 50

291

85

Lane Configurations Traffic Volume (veh/h) Future Volume (Veh/h) Sign Control

Trailer Volume (verhi)   160   287   46   129   266   137   172   0   48   126   0   1     Trailer Volume (verhi)   160   287   46   129   266   137   172   0   48   126   0   1     Trailer Volume (verhi)   160   287   46   129   266   137   172   0   48   126   0   1     Trailer Volume (verhi)   160   287   46   129   266   137   172   0   48   126   0   1     Trailer Volume (verhi)   172   309   49   161   302   156   478   0   80   0.93   0.93   0.93     Trailer Volume (verhi)   172   309   49   161   302   156   478   0   80   140   0   1     Trailer Volume (verhi)   172   309   49   161   302   156   478   0   0   0     Trailer Volume (verhi)   172   309   49   161   302   156   478   172   309   49   161   478   479   479     Trailer Volume (verhi)   172   309   49   161   488   40   30   1438   314   435   440   388   40   30   40   40   44   44   479   4		<b>₹</b>	† H	► BR	WBL	<b>★</b> WBT	<b>₩</b>	<b>√</b> NBT	<b>←</b> NBT	<b>✓</b> NBR	<b>≯</b> la	→ SBT	SBR A
287 46 129 266 137 172 0 48 126 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	-	_ر	*	<b>K</b> _	<u>,                                    </u>	æ		-	æ			4	
Free 1, 12	160		287	94	129	266	137	172	0 0	<b>4</b> €	126	0 0	
0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0%	3		Free	2	<u>i</u>	Free	2	<u> </u>	Stop	2	3	Stop	
0,93 0,93 0,80 0,88 0,88 0,36 0,56 0,56 0,90 0,93 1,90 1,2			%0			%0			%0			%0	
309 49 161 302 156 478 0 80 140 0 316 316 11.2 0 11.3 0 11.3 0 11.3 0 11.3 0 11.3 0 11.3 0 11.3 0 11.3 0 11.3 0 11.3 0 11.3 0 11	0.93		0.93	0.93	0.80	0.88	0.88	0.36	0.36	09.0	06.0	0.93	0.93
2 5 6 6 6 6 6 702 702 702 702 702 702 702 702 702 702	172		309	49	161	302	156	478	0	8	140	0	119
3.6  None TWLTL  1.2  None TWLTL  3.63  3.63  4.1  4.1  4.1  4.1  4.1  4.1  4.1  4.			2						2				
None TWLTL  363 1403 1438 314 1435 1409  686 686 686 702 702  745 745 702 702  746 748 314 1435 1409  741 6.5 6.2 7.2 6.5  86 702 702  742 745 745 707  744 770 140 86 0 140 89 0 100  740 170 1700 1714 1700 1712 728 119  741 750 750 1700 1712 728 210  742 745 745 746 80 259  740 740 174 1700 1712 728 210  741 740 1712 728 210  741 740 1712 728 210  742 745 745 80 259  742 745 745 745 741 123  743 746 740 740 741 123  744 74 750 741 123  745 745 745 745 741 123  745 745 745 745 746 140  747 740 740 741 740 741 123  748 74 74 740 740 741 123  748 74 74 740 740 741 123  748 74 74 74 740 740 740 740 740 740  748 74 74 74 740 740 740 740 740 740 740  748 74 74 74 740 740 740 740 740 740 740  748 74 74 74 740 740 740 740 740 740 740 74			3.6						3.6				
TWLTL  363 363 41403 4148 314 1435 1409 688 688 688 702 702 702 702 703 704 41 1403 1488 314 1435 1409 702 703 704 705 706 706 706 706 707 707 707 707 707 707			1.2						1.2				
TWLTL  363 1403 1438 314 1435 1409 658 658 702 702 745 780 773 707 745 780 773 707 745 780 773 707 745 780 773 707 745 780 773 707 745 780 773 707 745 780 773 707 746 780 773 707 747 740 740 142 142 1435 1409 749 161 458 478 80 259 749 161 458 478 80 259 749 0 156 0 80 119 770 1174 1700 112 728 210 78 0.03 0.14 0.27 4.25 0.11 1.23 78 0.0 86 0.0 Err 10.6 1844 78 78 78 78 78 78 78 78 78 78 78 78 78 7			0						0				
TWLTL  363													
2 1403 1438 314 1435 1409 1438 363 1409 1436 1409 1436 1409 1436 1409 1436 1409 1436 1409 1436 1409 1436 1409 1436 1409 1436 1409 1436 1409 1436 1409 1436 1409 1436 1436 1436 1436 1436 1436 1436 1436			None		_	WLTL							
363 1403 1438 314 1435 1409 688 688 688 702 702 702 702 702 702 702 703 703 707 703 703						2							
363 1436 1409 658 688 702 702 702 702 702 702 703 703 703 704 703 703 707 705 705 705 705 705 705 705 705 705													
363 1403 1438 314 1435 1409 658 658 702 702 702 702 702 702 702 702 702 702													
658 658 702 702 702 702 703 703 703 703 703 703 703 703 703 703	428				363			1403	1438	314	1435	1409	382
2.2 7.4 780 773 707 745 780 773 707 745 780 773 707 745 780 773 707 745 780 741 7435 7409 741 741 741 741 741 741 741 741 741 741								658	658		702	702	
363 1403 1438 314 1435 1409 1435 1409 14135 1409 14135 1409 14135 1409 14135								745	780		733	707	
4.1 7.1 6.5 6.2 7.2 6.5 6.2 7.2 6.5 6.2 2.2 7.2 6.5 6.2 2.2 7.2 6.5 6.2 2.2 7.2 6.5 6.2 2.2 3.5 4.0 6.1 5.5 6.2 3.5 4.0 6.1 5.5 6.2 3.5 4.0 6.1 5.5 6.2 3.5 4.0 6.1 5.5 6.2 3.5 4.0 6.1 5.5 6.2 6.5 6.2 6.5 6.2 6.5 6.2 6.2 6.2 6.2 6.2 6.2 6.2 6.2 6.2 6.2	428				363			1403	1438	314	1435	1409	382
2.2 6.1 5.5 6.2 5.5 6.2 6.2 6.2 6.2 6.2 6.2 6.2 6.2 6.2 6.2	4.1				4.1			7.1	6.5	6.2	7.2	6.5	6.3
22 3.5 4.0 3.3 3.6 4.0 1174								6.1	5.5		6.2	2.2	
BB	2.2				2.2			3.5	4.0	3.3	3.6	4.0	3.4
H 1174 H 112 H 172 T 28 H 134 H 195 H 184 H 195 H 184 H 185	84				98			0	100	83	0	9	82
EB 3         WB 1         MB 2         NB 1         MB 2         SB 1           49         161         456         478         80         259           90         161         0         478         0         140           49         0         156         0         80         119           1700         1174         1700         112         210           0.03         0.14         0.27         4.25         0.11         1.23           0.0         8.6         0.0         Err         106         184           A         A         A         A         A         A           2.2         8867.0         1844         A           A         A         A         A         A         F           A         A         A         A         A         F           A         A         A         A         A         F           A         A         A         A         A         A           B         A         A         A         A         A           B         A         A         A         A         A	1103				1174			112	172	728	134	195	649
49 161 458 478 80 259 6 161 0 478 0 140 70 170 170 170 170 172 20 0.03 0.14 0.27 4.25 0.11 1.23 0.0 8.6 0.0 Err 2.9 1068 0.0 8.6 0.0 Err 2.9 1068 0.0 8.6 0.0 Err 2.9 144 A F B F B 2.2 8667.0 184.4 A CANADA REPLACE 184.4 A F B F B F B F B F B F B F B F B F B F	EB 1		EB 2	EB 3	WB 1	WB 2	NB 1	NB 2	SB 1				
0 161 0 478 0 140 49 0 156 0 80 119 1700 1174 1700 172 228 210 0.03 3.8 0.0 Err 2.9 106.8 0.0 8.6 0.0 Err 10.6 184.4 A F B F B F B F C SS67.0 184.4  2457.3 F C Level of Service	172		309	49	161	458	478	80	259				
49 0 156 0 80 119 1700 1174 1700 112 728 210 0.03 0.14 0.27 4.25 0.11 10.83 0.0 8.6 0.0 Err 10.6 1844 0.0 8.6 0.0 Err 10.6 1844 2.2 8867.0 1844 2.2 8867.0 1844 2.2 8867.0 1844 2.1 8867.0 1844 2.2 1867.0 1844 2.2 1867.0 1844 2.3 1868.0 10.1 10.0 10.0 10.0 10.0 10.0 10.0 1	172		0	0	161	0	478	0	140				
1700 1114 1700 112 728 210 0.03 0.14 0.27 4.25 0.11 1.23 0.0 8.6 0.0 Err 2.9 106.8 0.0 8.6 0.0 Err 2.9 106.8 2.2 8867.0 184.4 2.2 8867.0 184.4 2457.3 ICU Level of Service	0		0	49	0	126	0	8	119				
0.03 0.14 0.27 4.25 0.11 1.23 0.0 8.8 0.0 Err 2.9 106.8 0.0 Err 2.9 106.8 2.2 8.667.0 184.4 E E E E E E E E E E E E E E E E E E	1103		1700	1700	1174	1700	112	728	210				
0.0 3.8 0.0 Err 2.9 106.8 0.0 8.6 0.0 Err 10.6 18.44 A F B F B F 2.2 8567.0 184.4 F F F F F F F F F F F F F F F F F F	0.16		0.18	0.03	0.14	0.27	4.25	0.11	1.23				
0.0 8.6 0.0 Err 10.6 184.4 A F B F 2.2 8567.0 184.4 E457.3 CU Level of Service 15	4.4		0.0	0.0	3.8	0.0	ᇤ	2.9	106.8				
A F B F C S 8567.0 1844 F F F F F F F F F F F F F F F F F F F	8.9		0.0	0.0	9.8		Ē	10.6	184.4				
2.2 8667.0 184.4 F F L L L L L L L L L L L L L L L L L	⋖				∢		ш	Ω	ш				
F F F CU Level of Service	2.9				2.2		0.7938		184.4				
ICU Level of Service							ட		ட				
ICU Level of Service													
ICU Level of Service				457.3									
15				61.8%	ᅙ	J Level o	f Service			В			
				15									

3.3

3.5 90 526

91

213 50 163 705 0.30 110.2 12.3 12.3 B

Volume Total
Volume Left
Volume Left
Sch
Sch
Volume to Capacity
Oueue Length 95th (m)
Control Delay (siveh)
Lane LOS
Approach Delay (siveh)
Approach LOS

0.0

0 485 1700 0.29 0.0

95

250 6.2

436

492

Muclan storage veh)
Upstream storage veh)
Upstream signal (m)
Dx. plation unblocked
v.C. conflicting volume
v.C. stage 1 conf vol
v.C., stage 2 conf vol
v.C., single (s)
f.C. stage (s)
f.C. stage (s)
f.C. stage (s)
Oqueue free %
cM capacity (vehh)

250

436

492

None None

Median type

Synchro 12 Report Page 3 Proposed Residential Development 20 Caims Crescent, Huntsville Trans-Plan

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al Development 20 Cair	
d Residential Deve	
Proposed F	Trans-Plan

al Development 20 Cairns Crescent, Huntsville Sy	
ed Residential Development 20	22

ICU Level of Service

4.3 43.7% 15

Average Delay Intersection Capacity Utilization Analysis Period (min)

HCM Unsignalized Intersection Capacity Analysis<2028 Background> Weekday AM Peak Hour 5: Access & Cairns Crescent

HCM Unsignalized Intersection Capacity Analysis<2028 Background> Weekday AM Peak Hour 6: Kitchen Road South/Kithcen Road South & Main Street West/Main StreetWest 08/18/2025

0.75

0

0.64

0.64

0.88

0.88

0.78

0.78

Peak Hour Factor Hourly flow rate (vph) Pedestrians Lane Width (m) Walking Speed (m/s) Percent Blockage

504 504 Free 0% 0.88 573

426 426 426 0.78 0.78

28 28

4 4

Traffic Volume (veh/h) Future Volume (Veh/h)

Sign Control

Lane Configurations

0

3.6

3.6

None

TWLTL 2

Right turn flare (veh)

Median type

Stop 0% 0.75

Stop 0% 0.64

SBL

NBR

BE

WBR

EBR

ʹ

47

573 6.2 3.3 99 99 523

> 3.3 86 533

> 2.2 97 1016

> 2.2 100 1010

tC, single (s)
tC, 2 stage (s)
tF (s)
p0 queue free %
cM capacity (veh/h)

637 673 1210 6.5 6.5 7.0 4.0 100 361

1265 637 628 1265 7.1 6.1 3.5 3.0 306

> 557 6.2

564 637 1201 6.5 6.5 5.5 4.0 100 370

1204 640 640 7.1 7.1 6.1 3.5 97 360

> 565 4.1

> 573

573

222

565

573

Median storage veh)
Upstream signal (m)
pX, platron unblocked
vC, conflicting volume
vC1, stage 1 conf vol
vC2, stage 2 conf vol
vCu, unblocked vol

	†	<i>&gt;</i>	<b>/</b>	ţ	•	•	
Movement	EBT	EBR	WBL	WBT	NBL	NBR	
Lane Configurations	æ			4	<u>}</u>		
Traffic Volume (veh/h)	0	0	0	0	0	0	
Future Volume (Veh/h)	0	0	0	0	0	0	
Sign Control	Free			Free	Stop		
Grade	%0			%0	%0		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	0	0	0	0	0	0	
Pedestrians							
Lane Width (m)							
Walking Speed (m/s)							
Percent Blockage							
Right turn flare (veh)							
	None			None			
Median storage veh)							
Upstream signal (m)							
pX, platoon unblocked							
vC, conflicting volume			0		0	0	
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol			0		0	0	
tC, single (s)			4.1		6.4	6.2	
tC, 2 stage (s)							
tF(s)			2.2		3.5	3.3	
p0 queue free %			100		100	100	
cM capacity (veh/h)			1623		1023	1085	
Direction, Lane #	EB 1	WB 1	NB 1				
Volume Total	0	0	0				
Volume Left	0	0	0				
Volume Right	0	0	0				
CSH	1700	1700	1700				
Volume to Capacity	0.00	0.00	0.00				
Queue Length 95th (m)	0.0	0.0	0.0				
Control Delay (s/veh)	0.0	0.0	0.0				
Lane LOS			∢				
Approach Delay (s/veh)	0.0	0.0	0.0				
Approach LOS			⋖				
Intersection Summary							
Average Delay			0.0				
Intersection Capacity Utilization			%0.0	ᅙ	ICU Level of Service	Service	A
Analysis Period (min)			15				

Proposed Residential Development 20 Cairns Crescent, Huntsville Synchro 12 Report Trans-Plan Page 5

ICU Level of Service

1.2 42.1% 15

> Intersection Capacity Utilization Analysis Period (min)

3 0.01 0.1 11.9 B B

9 73 73 506 0.16 4.6 13.5 13.5

0.34

32 32 0 0.03 0.03 0.8 8.7 A A A

> 0.00 0.00 0.1 8.6 A

cSH
Volume to Capacity
Queue Length 95th (m)
Control Delay (siveh)
Lane LOS
Approach Delay (siveh)
Approach LOS

0.0 0.03 0.00 0.00

Volume Total Volume Left Volume Right

HCM Unsignalized Intersection Capacity Analysis<2028 Background> Weekday AM Peak Hour 7: Kitchen Road South & Cairns Crescent

Movement	EBL	EBR	펄	NBT	SBT	SBR
Lane Configurations	Þ			4	£,	
Traffic Volume (veh/h)	2	40	134	4	51	9
Future Volume (Veh/h)	2	40	134	44	21	9
Sign Control	Stop			Free	Free	
Grade	%0			%0	%0	
Peak Hour Factor	0.50	0.50	0.65	0.65	0.60	09.0
Hourly flow rate (vph)	10	8	206	89	32	10
Pedestrians	14			17	က	
Lane Width (m)	3.6			3.6	3.6	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	-			-	0	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	537	71	26			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	537	71	29			
tC, single (s)	6.4	7.2	4.1			
tC, 2 stage (s)	ļ					
tF(s)	3.5	4.2	2.2			
p0 queue free %	86	80	87			
cM capacity (veh/h)	430	755	1540			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	06	274	45			
Volume Left	9	206	0			
Volume Right	8	0	9			
cSH	969	1540	1700			
Volume to Capacity	0.13	0.13	0.03			
Queue Length 95th (m)	3.5	3.7	0.0			
Control Delay (s/veh)	10.9	.9	0.0			
Lane LOS	Ω :	∢ ;				
Approach Delay (s/veh)	10.9	6.1	0.0			
Approach LOS	മ					
Intersection Summary						
Average Delay			6.5			
Intersection Capacity Utilization	_		31.2%	<u> </u>	J Level o	ICU Level of Service A
Alidiysis Feriou (illiil)			2			

Proposed Residential Development 20 Cairns Crescent, Huntsville Synchro 12 Report Trans-Plan Page 7

HCM Unsignalized Intersection Capacity Analysis<2028 Background> Weekday PM Peak Hour 08/18/2025 1: Aspin Road/Aspdin Road & Highway 11 Southbound On/Off-Ramp

HCM Unsignalized Intersection Capacity Analysis<2028 Background> Weekday PM Peak Hour

2: Highway 11 Northbound On/Off-Ramp & Aspdin Road/Main Street West

08/18/2025

SBT

SBL

NBR

WBR

EBR

/

Ť

260

22

241

17-

421 Free 0% 0.89

443 443 60.83 0.83

Future Volume (Veh/h) raffic Volume (veh/h)

Sign Control

Lane Configurations

0.92

0.92

0.83 313

0.83

0.89

0.89

0.83

0.83 0

Peak Hour Factor Hourly flow rate (vph) Pedestrians

Lane Width (m)
Walking Speed (m/s)
Percent Blockage

Right turn flare (veh)

Median type

Stop 0% 0.83

Stop 0% 0.92

																																						Ą	
•	SBR		170	170		0.91	187										251			251	6.2		3.3	9/	785													Service	
و د	WBR SBL	X-		226 120	Stop	0.87 0.91											944			944	6.4		3.5	54	285	WB 2 SB 1				1700 454	0.0 42.9	0.0 29.5	۵	29.5				ICU Level of Service	
ļ	WBT WE	*			Free		251 2						None													WB 1 WE	251 2	0			0.0			0.0			6.4	50.1%	15
<b>↑</b>	EBL EBT			17 500	Free	Ŭ	22 649						None				251			251	4.3		2.4	98	1216	EB 1 EB 2	22 649	22 0			0.4 0.0		∢	0.3					
`	Movement	Lane Configurations	Traffic Volume (veh/h)	Future Volume (Veh/h)	Sign Control	Peak Hour Factor 0.	ate (vph)	Pedestrians	Lane Width (m)	Walking Speed (m/s)	Percent Blockage	Right turn flare (veh)	Median type	Median storage veh)	Upstream signal (m)	pX, platoon unblocked		vC1, stage 1 conf vol	vC2, stage 2 conf vol	vCu, unblocked vol	tC, single (s)	stage (s)			cM capacity (veh/h) 12	Direction, Lane #		Volume Left	ne Right	•	(F	lay (s/veh)		/ (s/veh)	Approach LOS	Intersection Summary	Average Delay	Intersection Capacity Utilization	Analysis Period (min)

3.3 100 595

4.0 243

3.5 100 58

3.3 43 548

4.0 100 243

3.6 87 211

2.2 100 1044

2.2 100 1099

tC, single (s)
tC, 2 stage (s)
tF (s)
p0 queue free %
cM capacity (veh/h)

473 6.2

1007

1320

534 6.2

1007

7.2

534

473

473

1007

1320

534

1007

1007

534

473

Median storage veh)
Upstream signal (m)
pX, platron unblocked
vC, conflicting volume
vC1, stage 1 conf vol
vC2, stage 2 conf vol
vCu, unblocked vol

None

None

Synchro 12 Report Page 1 Proposed Residential Development 20 Cairns Crescent, Huntsville Trans-Plan

Development 20 Cairns	
Proposed Residential	Trans-Plan

⋖

ICU Level of Service

5.2 47.3% 15

Intersection Capacity Utilization Analysis Period (min)

340 27 313 486 0.70 0.70 D D D D

271 1700 0.16 0.0

0.0 0.28 0.0 0.0

213 213 0.13 0.00

0.31

cSH Volume to Capacity Queue Length 95th (m) Control Delay (s/veh)

0.0

0.0

Approach Delay (s/veh) Approach LOS

271

534

Volume Total Volume Left Volume Right

scent, Huntsville	
20 Cairns Cres	
evelopment 2	
pposed Residential Development 20 Cairns Crescent, Huntsvill	ins-Plan

HCM Unsignalized Intersection Capacity Analysis<2028 Background> Weekday PM Peak Hour 3: Cairns Drive & Main Street West

HCM Unsignalized Intersection Capacity Analysis<2028 Background> Weekday PM Peak Hour نام ۱۳۰۰ منیست • منیسه استیم و 18/18/2025

42

98

Lane Configurations Traffic Volume (veh/h) Future Volume (Veh/h) Sign Control

SBL 138 138 Stop 0% 0.86 160

SBR

0.86

0.88

60% 0.88 5

60% 0.80 5

0.80

Peak Hour Factor
Hourly flow rate (vph)
Pedestrians
Lane Width (m)
Walking Speed (m/s)
Percent Blockage
Right turn flare (veh)

EBL EBT E  117 452 17 462 17 462 17 462 17 462 17 462 17 666 18 686 18 686 19 686 10 10 10 10 10 10 10 10 10 10 10 10 10 1	EBL  Inations  The (vehl/h)  117  The (Vehl/h)  The (Vehl/	# 452 452 452 Free 0% 0.85 532 532 None	EBR 136 136 160 160	1 1 m - 1	WBT 415 415 415 616 00% 00% 00.92 451 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	0.92 108 117	135 135 135 193	NBT 0 0 0 Stop 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.70 0.99	SBL 148 148 0.85	SBT 4	SBR 185 185
rations   1	urations 117 ne (veh/h) 117 ne (veh/h) 117 ne (veh/h) 118 mator 0.85 actor 0.85 actor 0.85 are (vph) 138 m) m) med (mis) ned (mis) ned (mis) ned (mis) ned (mis)	452 452 452 Free 0% 532 532	136 136 160		415 415 415 0.92 451 451	108 0.92 117	135 135 0.70	Stop 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	69 0.7.0 99	148 148 0.85	<b>4</b> 00 c	185
le (veh/h) 117 452 136 44 415 108 135 0 68 148 let (veh/h) 117 452 136 44 415 108 135 0 69 148 let (veh/h) 117 452 136 44 415 108 135 0 69 148 let (veh/h) 138 532 160 48 451 117 193 0 99 174 let (veh/h) 138 532 160 48 451 117 193 0 99 174 let (veh/h) 138 532 160 48 451 117 193 0 99 174 let (veh/h) 138 532 160 48 692 147 let (veh/h) 1014 1014 1014 1014 1014 1014 1014 101	ne (veh/h) 117 ne (veh/h) 117 actor 0.85 actor 0.85 act (vph) 138 m) ed (m/s) ed (m/s) Rage en (veh) N	452 452 Free 0% 0.85 532 None	0.85 136 160 160		415 415 0.92 451 2	0.92	135 135 193	Stop 0.70 0.70 0	69 69 0.70 99	148 148 0.85 174	0 0	185
Prec	ne (Veh/h) 117 actor 0.85 ate (vph) 138 m) 138 ed (m(s) ed (w(s) kage re (veh) N	452 Free 0% 532 532 None	136 0.85 160		415 Free 0.92 451 2	0.92	135	Stop 0,70 0	0.70	0.85	0 0	185
Free Free Froe Stop O%	actor 0.85 atle (vph) 138 m) m) (m) kage re (veh) nod (m)	None None	160		Free 0.92 0.92 451 2	117	193	Stop 0.70 0	0.70	0.85	Ston	
0.85 0.85 0.85 0.92 0.92 0.70 0.70 0.70 0.85 1.38 0.85 0.85 0.92 0.92 0.70 0.70 0.70 0.85 1.34 0.85 0.85 0.85 0.92 0.92 0.70 0.70 0.70 0.85 1.34 0.85 0.85 0.85 0.85 0.85 0.85 0.85 0.85	0.85	0.85 532 None	0.8 <b>5</b> 160		0.92 451 451 2	0.92	193	0.70	0.70	0.85	250	
138 532 160 48 451 117 193 0 0 99 174  138 532 160 48 451 117 193 0 0 99 174  None	138	0.85 532 None	160		0.92 451 VLTL 2	117	193	0.70	0.70	174	%0	
None TWLTL  568 692 1573 1472 532 1513 568 692 692 1573 1472 532 1513 568 692 692 1573 1472 532 1513 568 692 1573 1472 532 1513 568 692 1573 1472 532 1513 569 692 1573 1472 532 1513 575 664 907 755 664 907 756 664 907 757 65 664 907 758 692 1573 1472 532 1513 758 692 1573 1472 532 1513 759 750	138	532 None	160		451 VLTL 2	<del></del>	193	0	66	174	0.85	0.85
None		None			WLTL 2						0	218
None   TMLTL		None			WLTL 2							
) None TWLTL  2		None			MLTL 2							
None		None			WLTL 2							
None		None			WLTL 2							
None		None			WLTL 2							
150   150	Median storage veh)			692	2							
ed 568 692 1573 1472 532 1513 or 1 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	Instream signal (m)			692								
ed 668 689 692 1573 1472 532 1513 668 600 606 606 600 606 600 606 600 600				692								
1	pX, platoon unblocked			692								
1   2.0   2.0   1.0   2.0   1.0   2.0   1.0   2.0   1.0   2.0   1.0   2.0   1.0   2.0   1.0   2.0   1.0   2.0   1.0   2.0   1.0   2.0							1573	1472	532	1513	1574	510
1							808	808		909	909	
568         692         1573         1472         532         1513           4.1         4.1         4.1         4.1         7.1         6.5         6.2         7.1           2.2         2.2         3.5         4.0         3.3         3.5         4.0         7.1         6.1         5.5         6.1         7.1         6.1         7.1         6.1         7.1         6.1         7.1         6.1         7.1         6.1         7.1         6.1         7.1         6.1         7.1         7.1         6.1         7.1         7.1         7.2         7.1         7.2         7.1         7.2         7.1         7.2         7.1         7.2         7.1         7.2         7.1         7.1         7.2         7.1         7.2         7.1         7.2         7.1         7.2         7.1         7.2         7.1         7.2         7.1         7.2         7.2         7.1         7.2         7.2         7.1         7.2         7.1         7.2         7.2         7.2         7.1         7.2         7.2         7.1         7.2         7.2         7.2         7.2         7.2         7.2         7.2         7.2         7.2         7.2         7.2	vC2, stage 2 conf vol						765	999		206	896	
H.1 4.1 4.1 7.1 6.5 6.2 7.1  2.2 2.2 2.2 3.3 6.1  8.6 1 6.1  EB 1 EB 2 EB 3 WB 1 WB 2 NB 1 NB 2 SB 1  138 532 160 48 568 193 99 392  1014 1070 1700 91 170 90 551 286  0.14 0.31 0.09 0.05 0.05 214 0.18 1.38  (m) 3.8 0.0 0.0 1.3 0.0 6.56.2 13.0 224.9  9 1.5 A A A A B A B B B F B B F B B B B B B B				692			1573	1472	532	1513	1574	510
Color   Colo				4.1			7.1	6.5	6.2	7.1	6.5	6.2
2.2 2.2 2.2 3.5 4.0 3.3 3.5 1  86 95 95 0 100 82 1  1014 EB1 EB2 EB3 WB1 WB2 NB1 NB2 SB1 176  138 532 160 48 568 193 99 392	tC, 2 stage (s)						6.1	5.5		6.1	5.5	
He   He   He   He   He   He   He   He				2.2			3.5	4.0	3.3	3.5	4.0	3.3
1014   912   813   WB   NB   NB   SB   176   176   138   532   160   48   568   193   99   392   138   138   0   0   48   0   138   0   174   1014   1014   1000   0   0   0   117   0   99   218   1014   1014   1000   0   0   0   0   0   0   0   0	ene free %			92			0	100	82	-	100	6
Med Delay         EB1         EB2         EB3         WB1         WB2         NB1         NB2         SB1           me Total         138         532         160         48         568         193         99         392           me Left         138         0         160         48         0         174         99         218           me Right         0         160         0         117         0         99         218           me to Capacity         0.14         0.31         0.09         0.05         0.33         2.14         0.18         1.38           Le Longth 95th (m)         3.8         0.0         0.0         1.3         0.0         156.2         164.4           ri CS         A         A         A         A         A         B         F           ri CS         A         A         A         A         A         B         F           ri CS         A         A         A         A         A         B         F           ri CS         A         A         A         A         A         B         F           ri CS         A         A         A				912			6	241	551	176	220	562
me Total 138 532 160 48 568 193 99 392 me Left 138 0 0 48 0 193 0 174 me Right 0 0 0 160 0 117 0 99 218 me Right 1014 1700 1700 912 1700 90 551 285 me to Capacity 0.14 0.31 0.09 0.05 0.33 2.14 0.18 1.38 LeLength 95th (m) 3.8 0.0 0.0 1.3 0.0 136.8 5.2 164.4 rid Delay (siveh) 9.1 0.0 0.0 9.2 0.0 626.2 13.0 224.9 rid Cabacity Siveh) 1.5 A A H8.3 E F Section Summary 1.15 CU Level of Service	EB 1	EB 2			WB 2	NB 1	NB 2	SB 1				
me Left 138 0 0 48 0 193 0 174  me Right 0 160 0 1770 99 218  me to Capacity (siveh) 3.8 0.0 0.0 1.3 0.0 136.8 5.2 1644  rol Delay (siveh) 9.1 0.0 0.0 9.2 0.0 626.2 130 224.9 140S  and LOS  section Summary 1.15	138	532	160	48	568	193	66	392				
me Right 0 0 160 0 117 0 99 218  1014 1700 1700 912 1700 90 551 285  me to Capacity 0.14 0.31 0.09 0.05 0.33 2.14 0.18 1.38  ne Length Sist (m) 3.8 0.0 0.0 1.3 0.0 138.8 5.2 184.4  rol Delay (s/veh) 9.1 0.0 0.0 9.2 0.0 626.2 13.0 224.9  and Delay (s/veh) 1.5 A F F B F  section Summary F F F  99.5  CLU Level of Service	138	0	0	48	0	193	0	174				
1014   1700   1700   912   1700   955   285   286		0	160	0	117	0	66	218				
0.14 0.31 0.09 0.05 0.33 2.14 0.18 1.38 3.8 0.0 0.0 1.3 0.0 136.8 5.2 164.4 9.1 0.0 0.0 9.2 0.0 626.2 13.0 224.9 A A F B F 1.5 0.7 418.3 224.9 F F F 71.1% ICU Level of Service	1014	1700	1700	912	1700	6	551	285				
3.8 0.0 0.0 1.3 0.0 136.8 5.2 164.4 9.1 0.0 0.0 9.2 0.0 626.2 130 224.9 A A A F B F 1.5 0.7 418.3 224.9 F F F 71.1% ICU Level of Service	0.14	0.31	0.09	0.05	0.33	2.14	0.18	1.38				
9.1 0.0 0.0 9.2 0.0 626.2 13.0 224.9 A	3.8	0.0	0.0	1.3	0.0	136.8	5.2	164.4				
A A F B F F 1.5 0.7 418.3 224.9 F F F F F F F F F F F F F F F F F F F	9.1	0.0	0.0	9.5	0.0	626.2	13.0	224.9				
1.5 0.7 418.3 224.9 F F F F F F F F F F F F F F F F F F F				∢		ட	В	Ŀ				
F F 7 71.1% ICU Level of Service				0.7		418.3		224.9				
99.5 71.1% ICU Level of Service	Approach LOS					ட		ш				
99.5 TOU Level of Service	Intersection Summary											
71.1% ICU Level of Service	Acceptance of the second of th		000									
/ I.I% ICU Level OI Selvice	Average Delay		99.0	2	de laure l				c			
	Intersection Capacity Utilization		%!	3	Level or	Service			د			

3.3 95 1019

3.5 72 574

2.2 90 1495

54 6.2

355 6.4

103

Muclan storage veh)
Upstream storage veh)
Upstream signal (m)
Dx. plation unblocked
v.C. conflicting volume
v.C. stage 1 conf vol
v.C., stage 2 conf vol
v.C., single (s)
f.C. stage (s)
f.C. stage (s)
f.C. stage (s)
Oqueue free %
cM capacity (vehh)

54

355

103

None None

Median type

Synchro 12 Report Page 3 Proposed Residential Development 20 Caims Crescent, Huntsville Trans-Plan

-Plan

ICU Level of Service

8.4 30.3% 15

Average Delay Intersection Capacity Utilization Analysis Period (min)

209 160 49 639 0.33 111.4 13.3 B

Volume Total
Volume Left
Volume Left
Sch
Sch
Volume to Capacity
Oueue Length 95th (m)
Control Delay (siveh)
Lane LOS
Approach Delay (siveh)
Approach LOS

0.0

0.00 0.00 0.00

153 148

HCM Unsignalized Intersection Capacity Analysis<2028 Background> Weekday PM Peak Hour 08/18/2025 5: Access & Cairns Crescent

HCM Unsignalized Intersection Capacity Analysis<2028 Background> Weekday PM Peak Hour 6: Kitchen Road South/Kithcen Road South & Main Street West/Main StreetWest 08/18/2025 0.38

0 0.38

0.50

0.50

0.93

0.93

0.88

0.88 8

Peak Hour Factor Hourly flow rate (vph)

Pedestrians Lane Width (m) Walking Speed (m/s) Percent Blockage

Right turn flare (veh) Median storage veh)

Median type

6 3.6 0

None

TWLTL 2

Stop 0% 0.38

Stop 0% 0.50

538 538 Free 0% 0.93 578

630 630 630 Free 0% 0.88

8 24

Traffic Volume (veh/h) Future Volume (Veh/h)

Sign Control

-ane Configurations

SBL

NBR

**WBR** 

EBR

62

578

723

727

578

Upstream signal (m) px, platoon unblocked vC, conflicting volume vC1, stage 1 conf vol vC2, stage 2 conf vol vCu, unblocked vol

578 6.2 3.3 100 519

3.3 63 429

2.2 90 884

2.2 99 1006

tC, single (s)
tC, 2 stage (s)
tF (s)
p0 queue free %
cM capacity (veh/h)

752 743 743 6.5 6.5 6.5 7.0 98 266

1645 752 893 1645 7.1 6.1 3.5 100

723 6.2

739 752 1491 6.5 5.5 4.0 98

739 755 1493 7.1 6.1 3.5 95

727

578 4.1

	†	<u> </u>	<b>&gt;</b>	ţ	•	•	
Aovement	EBT	EBR	WBL	WBT	NBL	NBR	
ane Configurations	æ			÷	>		
raffic Volume (veh/h)	0	0	0	0	0	0	
Future Volume (Veh/h)	0	0	0	0	0	0	
Sign Control	Free			Free	Stop		
Grade	%0			%0	%0		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	0	0	0	0	0	0	
Pedestrians							
-ane Width (m)							
Walking Speed (m/s)							
Percent Blockage							
Right turn flare (veh)							
Median type	None			None			
Median storage veh)							
Jpstream signal (m)							
oX, platoon unblocked							
/C, conflicting volume			0		0	0	
/C1, stage 1 conf vol							
vC2, stage 2 conf vol							
/Cu, unblocked vol			0		0	0	
C, single (s)			4.1		6.4	6.2	
C, 2 stage (s)							
F (s)			2.2		3.5	3.3	
of queue free %			100		100	100	
cM capacity (veh/h)			1623		1023	1085	
Direction, Lane #	EB 1	WB 1	NB 1				
/olume Total	0	0	0				
Volume Left	0	0	0				
/olume Right	0	0	0				
SSH	1700	1700	1700				
/olume to Capacity	0.00	0.00	0.00				
Queue Length 95th (m)	0.0	0.0	0.0				
Control Delay (s/veh)	0.0	0.0	0.0				
ane LOS			∢				
Approach Delay (s/veh)	0.0	0.0	0.0				
Approach LOS			∢				
ntersection Summary							
Average Delay			0.0				
ntersection Capacity Utilization	Ļ		%0.0	<u>0</u>	ICU Level of Service	Service	∢
Analysis Period (min)			15				

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Proposed Residential Development 20 Ca	
Residential D	_
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Synchro	

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ICU Level of Service

3.0 59.8% 15

Intersection Capacity Utilization Analysis Period (min)

178 158 405 0.44 17.5 20.7 C

0.34

87 87 0 0 0.10 2.6 9.5 A A

0.01 0.02 8.6 A 0.1

cSH Volume to Capacity Queue Length 95th (m) Control Delay (s/veh) Lane LOS

Approach Delay (s/veh) Approach LOS

0.0 0.0 0.0 0.0

22

Volume Total Volume Left Volume Right

Huntsville	
Crescent, F	
0 Cairns	
roposed Residential Development 20 Cairns Cre	
Residential	_
roposed	ans-Plan

HCM Unsignalized Intersection Capacity Analysis<2028 Background> Weekday PM Peak Hour 7: Kitchen Road South & Cairns Crescent

		I .																																						
																																							⋖	
_	SBR	Œ	9 9			0.75	œ																																ervice	
<b>•</b>	SBT	<b>,</b>	20 2	Free				_	3.6	1.2	0		None																										ICU Level of Service	
•	NBT	<b>₩</b>	7 2	Free	%0	69.0	107						None																										<u>3</u>	
•	NBL	83	82 8			0.69	119										37			37	4.1		2.2	95	1584	SB 1	35	0	œ	1700	0.02	0.0	0.0		0.0			6.8	30.4%	15
<i>&gt;</i>	EBR	137	137			0.50	274										33			33	6.2		3.3	74	1045	NB 1	226	119	0	1584	0.08	1.9	4.2	∢	4.2					
4	EB	<b>&gt;</b> -"	, w	Stop	%0	0.50	9	2	3.6	1.2	0						379			379	6.4		3.5	66	218	EB 1	280	9	274	1027	0.27	8.9	8.6	∢	8.6	∢			ou	
	Movement	-ane Configurations	Future Volume (Veh/h)	Sign Control	Grade	Peak Hour Factor	Hourly flow rate (vph)	Pedestrians	-ane Width (m)	Valking Speed (m/s)	Percent Blockage	Right turn flare (veh)	Median type	Median storage veh)	Jpstream signal (m)	pX, platoon unblocked	VC, conflicting volume	/C1, stage 1 conf vol	vC2, stage 2 conf vol	/Cu, unblocked vol	C, single (s)	C, 2 stage (s)	IF (s)	p0 queue free %	cM capacity (veh/h)	Direction, Lane #	/olume Total	/olume Left	/olume Right	SSH	/olume to Capacity	Queue Length 95th (m)	Control Delay (s/veh)	ane LOS	Approach Delay (s/veh)	Approach LOS	ntersection Summary	Average Delay	ntersection Capacity Utilization	Analysis Period (min)

Synchro 12 Report Page 7 Proposed Residential Development 20 Cairns Crescent, Huntsville Trans-Plan

08/18/2025 <2028 Total> Weekday AM Peak Hour 1: Aspin Road/Aspdin Road & Highway 11 Southbound On/Off-Ramp HCM Unsignalized Intersection Capacity Analysis

<2028 Total> Weekday AM Peak Hour

08/18/2025

2: Highway 11 Northbound On/Off-Ramp & Aspdin Road/Main Street West

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EBR

HCM Unsignalized Intersection Capacity Analysis

SBT

SBL

NBR

179

22

151

-9 19 19 19

0 0

Traffic Volume (veh/h) Future Volume (Veh/h)

Sign Control

Lane Configurations

0.92

0.92 0

0.81

0.81

0.93

0.00

0.88

0.88 0

Peak Hour Factor Hourly flow rate (vph) Pedestrians Lane Width (m) Walking Speed (m/s) Percent Blockage

0.0

Stop 0% 0.92

Stop 0% 0.81

294 294 Free 0% 0.93 316

320 320 Free 0% 0.88 364

																																								A	
•	SBR		134	134			69.0	194										190			190	6.2		3.3	77	848														f Service	
) J	WBR SBL	X.			Stop			153 219	5	3.6	1.2	0						617			617	6.5		3.6	20	436	WB 2 SB 1	153 413			1700 565		0.0 49.3		٥	26.8	٥			ICU Level of Service	
<b>↓</b>	EBT WBT		329 174		_		0.85 0.94							None None													EB 2 WB 1	_	0 0		1700 1700		0.0 0.0			0.0			2.6	40.6%	15
<u> </u>	EBLE	<u>.</u>	17	17	ш		0.85 0							ž				190			190	4.6		2.6	86	1150	EB 1 E	20	20		1150 17		0.4		∢	0.4				ıtion	
	Movement	Lane Configurations	Traffic Volume (veh/h)	Future Volume (Veh/h)	Sign Control	Grade	Peak Hour Factor	Hourly flow rate (vph)	Pedestrians	Lane Width (m)	Walking Speed (m/s)	Percent Blockage	Right turn flare (veh)	Median type	Median storage veh)	Upstream signal (m)	pX, platoon unblocked	vC, conflicting volume	vC1, stage 1 conf vol	vC2, stage 2 conf vol	vCu, unblocked vol	tC, single (s)	tC, 2 stage (s)	tF(s)	p0 queue free %	cM capacity (veh/h)	Direction, Lane #	Volume Total	Volume Left	Volume Right	SSH	Volume to Capacity	Queue Length 95th (m)	Control Delay (s/veh)	Lane LOS	Approach Delay (s/veh)	Approach LOS	Intersection Summary	Average Delay	Intersection Capacity Utilization	Analysis Period (min)

3.3 100 724

4.0 100 373

3.5 100 173

3.4 67 666

4.0 100 373

3.9 91 316

2.2 100 1206

2.2 100 1250

364

Volume Total Volume Left Volume Right

321 6.2

685

906

364

685

680

364

321

Median storage veh)
Upstream signal (m)
Dy plation unblocked
v.c., conflicting volume
v.C., stage 1 conf vol
v.C., stage 2 conf vol
v.C., stage 2 conf vol
v.C., stage (s)
f.C., stage (s)

321

685

906

364

685

989

364

321

None

None

Right turn flare (veh)

Median type

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al Development 20 Cairns Crescent, Huntsvi
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ICU Level of Service

3.0 35.8% 15

Average Delay Intersection Capacity Utilization Analysis Period (min)

248 27 221 221 594 0.42 116.4 115.3 C

0.0

0.0

cSH
Volume to Capacity
Queue Length 95th (m)
Control Delay (s/veh)
Lane LOS
Approach Delay (s/veh)
Approach LOS

162 162 1700 0.10 0.0

316 0 0 1700 0.19 0.0

0.0 0.0 0.0 0.0

0.21 0.21 0.0

Proposed Residential Development 20 Cairns Crescent, Huntsville	Sy
Trans-Plan	

HCM Unsignalized Intersection Capacity Analysis 3: Caims Drive & Main Street West

<2028 Total> Weekday AM Peak Hour 08/18/2025

•	SBR	1	11	111			0.93	119										382			382	6.3		3.4	82	649															
<b>→</b>	SBT	4	0	0	Stop	%0	0.93	0										1416	702	714	1416	6.5	5.5	4.0	100	192															
٠	SBL		126	126			06.0	140										1435	702	733	1435	7.2	6.2	3.6	0	134															
•	NBR		48	48			09.0	8										314			314	6.2		3.3	8	728														ω	,
<b>←</b>	NBT	æ,	0	0	Stop	%0	0.36	0	2	3.6	1.2	0						1438	658	780	1438	6.5	5.5	4.0	100	171	SB 1	259	140	119	210	1.23	106.8	184.4	ட	184.4	ш				
•	NBL	*	192	192			0.36	533										1403	658	745	1403	7.1	6.1	3.5	0	112	NB 2	80	0	8	728	0.11	2.9	10.6	മ						
4	WBR		137	137			0.88	156																			NB 1	533	533	0	112	4.75	Ä	Ē	ш	8695.5	ш			CU Level of Service	
ţ	WBT	æ,	266	266	Free	%0	0.88	302						TWLTL	2												WB 2	458	0	156	1700	0.27	0.0	0.0						CU Level	
-	WBL	*	129	129			0.80	161										370			370	4.1		2.2	88	1167	WB 1	161	161	0	1167	0.14	3.8	8.6	∢	2.2					
<b>/</b>	EBR	*	25	52			0.93	26																			EB3	26	0	29	1700	0.03	0.0	0.0					2653.3	61.8%	2
Ť	EBT	*	287	287	Free	%0	0.93	309	2	3.6	1.2	0		None													EB 2	309	0	0	1700	0.18	0.0	0.0							
^	图	¥	160	160			0.93	172										458			458	4.1		2.2	84	1103	EB 1	172	172	0	1103	0.16	4 4	8.9	∢	2.8				u	
	Movement	Lane Configurations	Traffic Volume (veh/h)	Future Volume (Veh/h)	Sign Control	Grade	Peak Hour Factor	Hourly flow rate (vph)	Pedestrians	Lane Width (m)	Walking Speed (m/s)	Percent Blockage	Right turn flare (veh)	Median type	Median storage veh)	Upstream signal (m)	pX, platoon unblocked	vC, conflicting volume	vC1, stage 1 conf vol	vC2, stage 2 conf vol	vCu, unblocked vol	tC, single (s)	tC, 2 stage (s)	tF(s)	p0 queue free %	cM capacity (veh/h)	Direction, Lane #	Volume Total	Volume Left	Volume Right	SH	Volume to Capacity	Queue Length 95th (m)	Control Delay (s/veh)	Lane LOS	Approach Delay (s/veh)	Approach LOS	Intersection Summary	Average Delay	Intersection Capacity Utilization	\$ fi - D i - d (i)

Proposed Residential Development 20 Cairns Crescent, Huntsville Trans-Plan

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<2028 Total> Weekday AM Peak Hour 08/18/2025

HCM Unsignalized Intersection Capacity Analysis 4: Caims Crescent & Caims Drive

		Ì		,		,	
Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations		₩	£,		Þ		
Traffic Volume (veh/h)	82	4	.4	311	47	134	
Future Volume (Veh/h)	82	4	4	311	47	134	
Sign Control		Free	Free		Stop		
Grade		%0	%0		%0		
Peak Hour Factor	0.93	0.93	09.0	09.0	0.82	0.82	
Hourly flow rate (vph)	91	4	7	518	22	163	
Pedestrians							
Lane Width (m)							
Walking Speed (m/s)							
Percent Blockage							
Right turn flare (veh)							
Median type		None	None				
Median storage veh)							
Upstream signal (m)							
yo, pratoon unblocked	525				452	266	
vC, collinging volume	050				404	2007	
vC2, stage 2 conf vol							
vCu, unblocked vol	525				452	266	
tC, single (s)	4.2				6.4	6.2	
tC, 2 stage (s)							
tF (s)	2.3				3.5	3.3	
p0 queue free %	91				68	79	
cM capacity (veh/h)	1012				513	770	
Direction, Lane #	EB 1	WB 1	SB 1				
Volume Total	92	525	220				
Volume Left	9	0	22				
Volume Right	0	518	163				
SSH	1012	1700	682				
Volume to Capacity	0.09	0.31	0.32				
Queue Length 95th (m)	2.4	0.0	11.2				
Control Delay (s/veh)	9.8	0.0	12.8				
Lane LOS	∢		മ				
Approach Delay (s/veh)	9.8	0.0	12.8				
Approach LOS			മ				
Intersection Summary							
Average Delay			4.3				
Intersection Capacity Utilization	ation		45 2%	<u></u>	D dva	CLLI evel of Service	A

Proposed Residential Development 20 Caims Crescent, Huntsville Trans-Plan

<2028 Total> Weekday AM Peak Hour 08/18/2025 HCM Unsignalized Intersection Capacity Analysis 5: Access & Cairns Crescent

																																								A	
•	NBR		31	31			0.92	34										4			4	6.2		3.3	97	1080														f Service	
•	NBL	<b>&gt;</b>	70	70	Stop	%0	0.92	22										54			54	6.4		3.5	88	986														CU Level of Service	
ţ	WBT	₩	0	0	Free	%0	0.92	0						None																											
-	WBL		တ	6			0.92	9										7			7	4.1		2.2	66	1614	NB 1	99	22	34	1041	0.05	4.	8.7	∢	8.7	∢		7.6	17.2%	15
<i>&gt;</i>	EBR		9	9			0.92	7																			WB 1	10	9	0	1614	0.01	0.1	7.2	∢	7.2					
†	EBT	<b>2</b>	0	0	Free	%0	0.92	0						None													EB 1	7	0	7	1700	0.00	0.0	0.0		0.0				c	
	Movement	Lane Configurations	Traffic Volume (veh/h)	Future Volume (Veh/h)	Sign Control	Grade	Peak Hour Factor	Hourly flow rate (vph)	Pedestrians	Lane Width (m)	Walking Speed (m/s)	Percent Blockage	Right turn flare (veh)	Median type	Median storage veh)	Upstream signal (m)	pX, platoon unblocked	vC, conflicting volume	vC1, stage 1 conf vol	vC2, stage 2 conf vol	vCu, unblocked vol	tC, single (s)	tC, 2 stage (s)	tF (s)	p0 queue free %	cM capacity (veh/h)	Direction, Lane #	Volume Total	Volume Left	Volume Right	cSH	Volume to Capacity	Queue Length 95th (m)	Control Delay (s/veh)	Lane LOS	Approach Delay (s/veh)	Approach LOS	Intersection Summary	Average Delay	Intersection Capacity Utilization	Analysis Period (min)

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HCM Unsignalized Intersection Capacity Analysis <2028 Total> Weekday AM Peak Hour 6: Kitchen Road South/Kithcen Road South & Main Street West/Main StreetWest 08/18/2025

			٠				-	-	-			
Movement	EBL	EBI	EBR	WBL	WBT	WBR	NBI	NBT	NBR	SBL	SBT	SBR
Lane Configurations	*	2,		¥	*			4			2,	
Traffic Volume (veh/h)	· m	426	14	37	504	0	9	.0	78	0	.0	2
Future Volume (Veh/h)	က	426	14	37	204	0	9	0	78	0	0	2
Sign Control		Free			Free			Stop			Stop	
Grade		%0			%0			%0			%0	
Peak Hour Factor	0.78	0.78	0.78	0.88	0.88	0.88	0.64	0.64	0.64	0.75	0.75	0.75
Hourly flow rate (vph)	4	546	18	42	573	0	တ	0	122	0	0	c
Pedestrians					_			_				
Lane Width (m)					3.6			3.6				
Walking Speed (m/s)					1.2			1.2				
Percent Blockage					0			0				
Right turn flare (veh)												
Median type		TWLTL			None							
Median storage veh)		2										
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	573			265			1224	1221	222	1334	1230	573
vC1, stage 1 conf vol							564	264		657	922	
vC2, stage 2 conf vol							099	657		219	573	
vCu, unblocked vol	573			265			1224	1221	222	1334	1230	573
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	33
p0 queue free %	100			96			6	100	11	100	100	66
cM capacity (veh/h)	1010			1016			351	362	533	257	321	523
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	4	564	42	573	131	3						
Volume Left	4	0	45	0	တ	0						
Volume Right	0	18	0	0	122	က						
CSH	1010	1700	1016	1700	515	523						
Volume to Capacity	0.00	0.33	0.04	0.34	0.25	0.01						
Queue Length 95th (m)	0.1	0.0	1.0	0.0	8.0	0.1						
Control Delay (s/veh)	8.6	0.0	8.7	0.0	14.4	11.9						
Lane LOS	∢		⋖		മ	ш						
Approach Delay (s/veh)	0.1		9.0		14.4	11.9						
Approach LOS					മ	മ						
Intersection Summary												
Average Delay			1.8									
Intersection Capacity Utilization	lou		48.1%	೦	ICU Level of Service	f Service			∢			
Alia Vsis Paliou (IIIIII)			2									

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HCM Unsignalized Intersection Capacity Analysis <2028 Total> Weekday AM Peak Hour 7: Kitchen Road South & Cairns Crescent

	~		15	2		0	10																																ice	
<b>→</b>	SBT SBR		21 1		Free 0%		35 25	က	3.6	1.2	0		None																										ICU Level of Service	
<b>←</b>	NBL NBT		134 44	134 44	Free 0%		206 68	17	3.6	1.2	_		None				74			74	4.1		2.2	98	1520	SB 1	09	0	25	1700	0.04	0.0	0.0		0.0			7.8		15
<b>*</b>	EBR		40				80										79			62	7.2		4.2		747 1	NB1 S	274	206				3.8		∢ ;	٥.				31	
1	EB	*	36	36	Stop 0%	0.50	72	14	3.6	1.2	_						545			545	6.4		3.5	83	424	EB 1	152	72	80	549	0.28	0.6	14.0	<b>m</b> 9	14.0	മ			zation	
	Movement	Lane Configurations	Traffic Volume (veh/h)	Future Volume (Veh/h)	Sign Control Grade	Peak Hour Factor	Hourly flow rate (vph)	Pedestrians	Lane Width (m)	Walking Speed (m/s)	Percent Blockage	Right turn flare (veh)	Median type	Median storage veh)	Upstream signal (m)	pX, platoon unblocked	vC, conflicting volume	vC1, stage 1 conf vol	vC2, stage 2 conf vol	vCu, unblocked vol	tC, single (s)	tC, 2 stage (s)	tF (s)	p0 queue free %	cM capacity (veh/h)	Direction, Lane #	Volume Total	Volume Left	Volume Right	SSH	Volume to Capacity	Queue Length 95th (m)	Control Delay (s/veh)	Lane LOS	Approach Delay (s/ven)	Approach LOS	Intersection Summary	Average Delay	Intersection Capacity Utilization	Analysis Period (min)

Proposed Residential Development 20 Cairns Crescent, Huntsville Synchro 12 Report Trans-Plan Page 7

<2028 Total> Weekday PM Peak Hour 08/18/2025 1: Aspin Road/Aspdin Road & Highway 11 Southbound On/Off-Ramp HCM Unsignalized Intersection Capacity Analysis

<2028 Total> Weekday PM Peak Hour

08/18/2025

2: Highway 11 Northbound On/Off-Ramp & Aspdin Road/Main Street West

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EBR

HCM Unsignalized Intersection Capacity Analysis

SBT

SBL

NBR

268 268

22

24 24 24 34

17-

Future Volume (Veh/h) raffic Volume (veh/h)

Sign Control

Lane Configurations

0.92

0.92

0.83

0.83

0.89

0.89

0.83

0.83 0

Peak Hour Factor Hourly flow rate (vph) Pedestrians

Lane Width (m)
Walking Speed (m/s)
Percent Blockage

Right turn flare (veh)

Median type

429 429 Free 0% 0.89

451 451 Free 0% 0.83 543

Stop 0% 0.83

Stop 0% 0.92

482

1025 6.5

1348

543

1025

1025 7.2

543

482

482

1025

1348

543

1025

1025

543

482

Median storage veh)
Upstream signal (m)
pX, platron unblocked
vC, conflicting volume
vC1, stage 1 conf vol
vC2, stage 2 conf vol
vC2, unblocked vol

None

None

3.3 100 588

4.0 100 237

3.5 100 52

3.3 40 542

4.0 100 237

3.6 87 205

2.2 100 1036

2.2 100 1091

tC, single (s)
tC, 2 stage (s)
tF (s)
p0 queue free %
cM capacity (veh/h)

																																								A
•	SBR		170	170			0.91	187										255			522	6.2		3.3	9/	781														Sarvice
٠	SBL	>	124	124	Stop	%0	0.91	136										954			954	6.4		3.5	25	781	SB 1	323	136	187	446	0.72	45.9	31.5	۵	31.5	۵			CILI eye of Service
✓	WBR	*	230	230			0.87	264																			WB 2	264	0	564	1700	0.16	0.0	0.0						_
ţ	WBT	*	222	222	Free	%0	0.87	255						None													WB 1	255	0	0	1700	0.15	0.0	0.0		0.0			8.9	50 5%
†	EBT	*	204	504	Free	%0	0.77	655						None													EB 2	922	0	0	1700	0.39	0.0	0.0						
•	盟	r	17	17			0.77	22										255			255	4.3		2.4	86	1212	EB 1	22	52	0	1212	0.02	0.4	8.0	∢	0.3				9
	Movement	Lane Configurations	Traffic Volume (veh/h)	Future Volume (Veh/h)	Sign Control	Grade	Peak Hour Factor	Hourly flow rate (vph)	Pedestrians	Lane Width (m)	Walking Speed (m/s)	Percent Blockage	Right turn flare (veh)	Median type	Median storage veh)	Upstream signal (m)	pX, platoon unblocked	vC, conflicting volume	vC1, stage 1 conf vol	vC2, stage 2 conf vol	vCu, unblocked vol	tC, single (s)	tC, 2 stage (s)	tF (s)	p0 queue free %	cM capacity (veh/h)	Direction, Lane #	Volume Total	Volume Left	Volume Right	cSH	Volume to Capacity	Queue Length 95th (m)	Control Delay (s/veh)	Lane LOS	Approach Delay (s/veh)	Approach LOS	Intersection Summary	Average Delay	Intersection Capacity Hillization

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Proposed Resident	<u>.</u>
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ICU Level of Service

5.6 48.2% 15

Intersection Capacity Utilization Analysis Period (min)

350 27 323 481 0.73 47.2 30.0 D

0.0 0.0 0.0 0.0

0 1700 0.28 0.0

213 213 0.13 0.00

0.32

cSH Volume to Capacity Queue Length 95th (m) Control Delay (s/veh) Lane LOS

543

Volume Total Volume Left Volume Right

0.0

0.0

Approach Delay (s/veh) Approach LOS

HCM Unsignalized Intersection Capacity Analysis 3: Caims Drive & Main Street West

FBL   EBT   EBR   WBL   WBT   WBR   NBL   NBT   NBR   SBL   SBT		1	<b>†</b>	<i>&gt;</i>	<b>&gt;</b>	ţ	4	•	<b>←</b>	•	٠	<b>→</b>	•
Configurations         Image (s)	vement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vehith)   117   452   153   44   415   108   146   0   69   148   0     Free   Free   Free   Stop   0%   0%   0%     Free   Free   Stop   0%   0%   0%   0%   0%     Free   Free   Stop   0%   0%   0%   0%   0%   0%     Free   Free   Stop   0%   0%   0%   0%   0%   0%   0%   0	ne Configurations	K	*	ĸ	r	£3		K	2,			4	
Owntrol         (Vehith)         117         452         153         44 415         108         148         0         69         148         0           Control         Free         Stop         OSA         OSA         OSA         OSA         OSA           Hour Factor         0.85         0.85         0.85         0.82         0.92         0.70         0.70         0.70         0.70         0.85         0.85           Hour Factor         0.85         0.85         0.82         0.82         0.70         0.70         0.70         0.70         0.70         0.70         0.78         0.85	affic Volume (veh/h)	117	452	153	4	415	108	146	.0	69	148	.0	185
Solution         Free         Free         Stop         Stop           Hour Factor         0.85	ture Volume (Veh/h)	117	452	153	4	415	108	146	0	69	148	0	185
None   138   532   180   48   451   117   209   0   99   174   0   170   170   0   0   0   0   0   0   0   0   0	In Control		Free			Free			Stop			Stop	
Hour Factor 0.88 0.85 0.85 0.85 0.82 0.92 0.70 0.70 0.70 0.86 0.88 0.88 0.84 451 117 229 0.0 99 174 0.0 4 48 451 117 229 0.0 99 174 0.0 4 48 451 117 229 0.0 99 174 0.0 4 48 451 117 229 0.0 99 174 0.0 4 48 451 117 229 0.0 99 174 0.0 4 48 451 117 229 0.0 99 174 0.0 4 48 451 117 229 0.0 99 174 0.0 4 48 48 48 48 48 48 48 48 48 48 48 48 4	ade		%0			%0			%0			%0	
And below rate (vph)         138         532         180         48         451         117         209         0         99         174         0           Artifation (with) (m.) (with) (m.)         138         532         180         48         451         117         209         0         99         174         0           Artifation (with) (m.)         138 Speed (m.)s)         None         TWLTL         170         171	ak Hour Factor	0.85	0.85	0.85	0.92	0.92	0.92	0.70	0.70	0.70	0.85	0.85	0.85
tytians  Worth (m)  Worth (m)  Worth (m)  Worth (m)  None  In Blockage  Furn flare (veh)  In type  In Stogge veh)  In stogge veh)  In type  In the flag or for for fare flag or flag or fare flag or flag or fare	urly flow rate (vph)	138	532	180	48	451	117	209	0	66	174	0	218
Width (m)         Width (m)           Width (m)         Width (m)           off Speed (m/s)         None         TWLTL           nt Blockage         None         TWLTL           nt storage veril)         Sea         T712         1573         1472         532         1513           atom unblocked will storated void stage 1 conf voil storated will storated void stage 2 conf voil storated will storated void stage 2 conf voil storated will s	destrians												
tg Speed (m/s)         TWLTL         TYLTL           tm Blockage furn (weh)         None         TYLTL           n type         n storage weh)         2           and m signal (m)         808         808         606           atage 1 conf vol         712         1573         1472         532         1513           atage 2 conf vol         4.1         4.1         7.1         6.5         6.2         7.1           stage 2 conf vol         4.1         4.1         7.1         6.5         6.2         7.1           stage 2 conf vol         4.1         4.1         7.1         6.5         6.2         7.1           stage 1 conf vol         568         7.1         6.1         5.5         6.2         7.1           stage 2 conf vol         4.1         4.1         4.1         7.1         6.1         5.5         6.1           stage 1 conf vol         4.1         4.1         4.1         7.1         6.1         5.5         6.1           stage 2 conf vol         4.1         4.1         4.1         4.1         7.1         6.1         5.2         7.1           stage 2 conf vol         4.1         4.1         4.1         7.1	ne Width (m)												
Inter (veit)  None TWLTL  as storage veit)  as an signal (m)  as a	Iking Speed (m/s)												
turn flare (veh)         None         TWLTL         PRACTAL           n styge         n styge         1712         1573         1472         532         1513         1514         152         1513         1513	rcent Blockage												
n type (iii)  In storage verit)  In storage verity  In storage (s)  In storage verity  In storage (s)	tht turn flare (veh)												
atem signal (iii)  atem signal (	dian type		None		ľ	TWLTL							
sem signal (m) attacon unblocked attage 1 conf vol attage 1 conf vol and conf vol attage 2 conf vol and conf vol and conf vol attage 3 conf vol and con and conf vol and conf	dian storage veh)					2							
attoon unblocked  attoon unblocked  attoon unblocked  attoologe conford  attoologe confor	stream signal (m)												
Attace I conf vol         568         712         1573         1472         532         1513           Attace I conf vol         568         712         712         66         606         606           Attace I conf vol         4.1         4.1         7.1         6.5         6.2         7.1           Attack of conf vol         4.1         4.1         7.1         6.5         6.2         7.1           Attack of conf vol         4.1         4.1         7.1         6.5         6.2         7.1           Attack of conf vol         4.1         4.1         7.1         6.5         6.2         7.1           Attack of conf vol         86         95         9         9         241         551         7.1           Attack of conf vol         1014         897         MB         MB         MB         241         551         7.1           Attack of conf conf conf conf conf conf conf c	platoon unblocked												
stage I conf vol         stage I conf vol<	, conflicting volume	268			712			1573	1472	532	1513	1594	510
lage 2 conf vol         568         712         765         664         907           ninblooked vol         568         712         1573         1472         55         65         1513           sigge (s)         4.1         4.1         4.1         6.1         5.5         6.2         7.1           sigge (s)         2.2         2.2         3.5         4.0         3.3         3.5           pacify (verhit)         10.1         4.8         86         95         0         100         82         1           pacify (verhit)         10.1         1.0         4.8         568         209         99         241         551         176           pacify (verhit)         1.0         1.0         4.8         568         209         99         241         551         176           pacify (verhit)         1.38         0         0         48         568         209         99         214         76         77           per Left         1.38         0         0         4.8         0         0         174         1.7         0         99         214         1.7           e Left         1.3         0.1 <th< td=""><td>1, stage 1 conf vol</td><td></td><td></td><td></td><td></td><td></td><td></td><td>808</td><td>808</td><td></td><td>909</td><td>909</td><td></td></th<>	1, stage 1 conf vol							808	808		909	909	
righe (s)         4.1         4.1         4.1         4.2         532         1513           sige (s)         4.1         4.1         4.1         4.1         6.5         6.1         5.5         6.1         5.1         6.5         6.1         7.1         6.5         6.2         7.1         6.5         6.1         7.1         6.5         6.2         7.1         6.5         6.1         7.1         6.5         6.1         7.1         6.5         6.2         7.1         6.5         6.1         7.1         6.5         6.1         7.1         6.5         6.1         7.1         6.5         6.1         7.1         6.1         7.1         6.5         7.1         6.1         7.1         6.1         7.1         6.1         7.1         6.1         7.1         6.1         7.1         6.1         7.1         6.1         7.1         6.1         7.1         6.1         7.1         6.1         7.1         7.1         7.2         7.1         7.2         7.1         7.2         7.1         7.2         7.2         7.2         7.2         7.2         7.2         7.2         7.2         7.2         7.2         7.2         7.2         7.2         7.2         <	2, stage 2 conf vol							765	664		206	886	
large (s)         4.1         4.1         7.1         6.5         6.2         7.1           stage (s)         2.2         6.1         5.5         6.1         5.6         6.1           aue free %         86         95         0         100         82         1           pacity (vehlt)         1014         897         90         241         551         176           pacity (vehlt)         1014         897         MB         MB         NB         281         176           ion, Lane #         EB 1         EB 2         EB 3         MB 1         MB 2         NB 1         NB 2         281         176           ion, Lane #         EB 1         EB 2         EB 3         MB 1         MB 2         NB 1         NB 2         281         176         176         176         176         176         176         176         177         176         177         178         178         178         178 <th< td=""><td>u, unblocked vol</td><td>268</td><td></td><td></td><td>712</td><td></td><td></td><td>1573</td><td>1472</td><td>532</td><td>1513</td><td>1594</td><td>510</td></th<>	u, unblocked vol	268			712			1573	1472	532	1513	1594	510
late (s)  late (	single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
2.2 2.2 3.5 4.0 3.3 3.5 pacifice % 86 95 0 100 82 1 pacify (vehly) 1014 897 0 100 82 1 pacify (vehly) 1014 188 22 180 48 0 209 99 392 per LeLft 138 532 180 48 0 209 99 392 per LeLft 1 0 0 180 0 117 0 99 218 per LeC Capacity 0.14 0.31 0.11 0.05 0.33 2.33 0.18 1.38 per LeC Capacity 0.14 0.31 0.11 0.05 0.33 2.33 0.18 1.38 per LeC Capacity (well) 3.8 0.0 0.14 0.0 14 0.0 152.2 5.2 164.5 per LeC Capacity (well) 3.8 0.0 0.0 1.4 0.0 152.2 5.2 164.5 per LeC Capacity (well) 3.8 0.0 0.0 1.4 0.0 152.2 5.2 164.5 per LeC Capacity (well) 1.5 p	2 stage (s)							6.1	2.5		6.1	2.5	
Bector S, Bell Bell Bell Bell Bell Bell Bell Bel	(8)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
1014   897   897   90   241   551   176     EB	dnene free %	98			92			0	100	85	_	100	61
EB 1   EB 2   EB 3   WB 1   WB 2   NB 1   NB 2   SB 1     138   532   180   48   568   209   99   392     138   0 0   48   0 0   209   0   174     0 0 0 0 0 0   177   0   99   518     1014   1700   1700   897   1700   90   551   285     0 0.14   0.31   0.11   0.05   0.33   2.33   0.18   1.38     3 8   0.0   0.0   1.4   0.0   182.2   5.2   184.5     4	capacity (veh/h)	1014			897			6	241	551	176	215	295
138 532 180 48 568 209 99 392 138 0 0 48 0 209 0 174 1014 1700 1700 897 1700 90 551 285 0.14 0.31 0.11 0.05 0.33 2.33 0.18 1.38 3.8 0.0 0.0 1.4 0.0 1822 5.2 164.5 9.1 0.0 0.0 92 0.0 705.8 13.0 224.9 A A A A F F B F 1.5 0.7 483.1 224.9 1.6 0.7 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2	ection, Lane #	EB 1	EB 2	EB3	WB 1	WB 2	NB 1	NB 2	SB 1				
138 0 0 48 0 209 0 174 0 0 180 0 117 0 99 218 1014 1700 1700 897 1700 90 551 285 0.14 0.31 0.11 0.05 0.33 2.33 0.18 1.38 3.8 0.0 0.0 1.4 0.0 152.2 5.2 164.5 9.1 0.0 0.0 9.2 0.0 765.8 130 224.9 A A A A F F B 1.5 0.7 483.1 224.9 F F Idization 71.1% ICU Level of Service	lume Total	138	532	180	48	268	209	66	392				
0 0 180 0 117 0 99 218 0.14 1700 1700 897 1700 90 551 285 0.14 0.31 0.11 0.02 0.33 2.33 0.18 1.38 3.8 0.0 0.0 14 0.0 152.2 5.2 164.5 9.1 0.0 0.0 9.2 0.0 765.8 13.0 224.9 A A A F B F 1.5 0.7 483.1 224.9 T 110.2 110.2 F 15 1.10.2 110.2 F	lume Left	138	0	0	48	0	500	0	174				
1014 1700 1700 897 1700 90 551 285 0.14 0.31 0.11 0.05 0.33 2.33 0.18 1.38 1.38 0.0 0.0 1.4 0.0 152.2 5.2 164.5 9.1 0.0 0.0 9.2 0.0 705.8 130 224.9 A A B B F B F B F B F B F B F B F B F B	lume Right	0	0	180	0	117	0	66	218				
0.14 0.31 0.11 0.05 0.33 2.33 0.18 1.38 3.8 0.0 0.0 1.4 0.0 192.2 5.2 164.5 9.1 0.0 0.0 9.2 0.0 705.8 130 224.9 A A A A F F B F F 1.5 0.7 483.1 224.9 F F F F 110.2 110.2 F F F 110.2 110.2 F F F F F F F F F F F F F F F F F F F		1014	1700	1700	897	1700	6	551	285				
3.8 0.0 0.0 1.4 0.0 152.2 5.2 164.5 9.1 0.0 0.0 9.2 0.0 765.8 130 224.9 A A A A A F B F B F F F F F F F F F F F	lume to Capacity	0.14	0.31	0.11	0.05	0.33	2.33	0.18	1.38				
9.1 0.0 0.0 9.2 0.0 705.8 13.0 224.9  A A F B F  1.5 0.7 483.1 224.9  F F  110.2  Idization 7.1.1% ICU Level of Service	eue Length 95th (m)	3.8	0.0	0.0	1.4	0.0	152.2	5.2	164.5				
A A F B F B F 1.5 0.7 483.1 224.9 F F B F F B F F B F F B F F F F F F F	ntrol Delay (s/veh)	9.1	0.0	0.0	9.5	0.0	705.8	13.0	224.9				
1.5 0.7 483.1 224.9 F F F F F F F F F F F F F F F F F F F	ne LOS	∢			∢		ட	В	ட				
F F F 110.2 110.2 IOU Level of Service 15.	proach Delay (s/veh)	1.5			0.7		483.1		224.9				
110.2 71.1% ICU Level of Service 15	proach LOS						ш		ш				
110.2 71.1% ICU Level of Service 15	ersection Summary												
71.1% ICU Level of Service	erage Delay			110.2									
-5-	ersection Capacity Utilization	uo		71.1%	<u>0</u>	U Level o	f Service			O			
	Analysis Period (min)			15									

Proposed Residential Development 20 Cairns Crescent, Huntsville Trans-Plan

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<2028 Total> Weekday PM Peak Hour 08/18/2025 HCM Unsignalized Intersection Capacity Analysis 4: Caims Crescent & Caims Drive

Movement	EBL	EBI	WBT	WBR	SBL	SBR	
Lane Configurations		4	£,		2		
Traffic Volume (veh/h)	118	4	4	26	155	42	
Future Volume (Veh/h)	118	4	4	97	155	42	
Sign Control		Free	Free		Stop		
Grade		%0	%0		%0		
Peak Hour Factor	0.80	0.80	0.88	0.88	0.86	98'0	
Hourly flow rate (vph)	148	2	2	110	180	49	
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	115				361	09	
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	115				361	09	
tC, single (s)	4.1				6.4	6.2	
tC, 2 stage (s)							
tF (s)	2.2				3.5	3.3	
p0 queue free %	06				89	95	
cM capacity (veh/h)	1480				269	1011	
Direction, Lane #	EB 1	WB 1	SB 1				
Volume Total	153	115	229				
Volume Left	148	0	180				
Volume Right	0	110	49				
SSH	1480	1700	628				
Volume to Capacity	0.10	0.07	0.36				
Queue Length 95th (m)	2.7	0.0	13.3				
Control Delay (s/veh)	7.5	0.0	14.0				
Lane LOS	∢		Ф				
Approach Delay (s/veh)	7.5	0.0	14.0				
Approach LOS			ω				
Intersection Summary							
Average Delay			8.8				
Intersection Capacity Utilization	tion		31.2%	<u>0</u>	U Level o	ICU Level of Service	¥
American Demind							

Proposed Residential Development 20 Cairns Crescent, Huntsville Trans-Plan

HCM Unsignalized Intersection Capacity Analysis 5: Access & Cairns Crescent

ity Analysis <2028 Total> Weekday PM Peak Hour 08/18/2025

																																								٧
•	NBR		16	16			0.92	17										0			ത	6.2		3.3	86	1073														Sanica
<b>√</b>	WBT NBL		0 11		Free Stop		0.92 0.92							None				63			63	6.4		3.5	66	927														coing of Jones 11101
<b>,</b>	WBL			22	ш		0.92	27						Ž				18			18	4.1		2.2	86	1599	NB 1				1007		0.7			8.7	A		6.1	/07/07
<i>&gt;</i>	EBT EBR	¢\$	0 17	0 17	Free		0.92 0.92							None													EB 1 WB 1	18 27	0 27		1700 1599		0.0 0.4			0.0 7.3				
	Movement	Lane Configurations	Traffic Volume (veh/h)	Future Volume (Veh/h)	Sign Control	Grade	Peak Hour Factor	Hourly flow rate (vph)	Pedestrians	Lane Width (m)	Walking Speed (m/s)	Percent Blockage	Right turn flare (veh)	Median type	Median storage veh)	Upstream signal (m)	pX, platoon unblocked	vC, conflicting volume	vC1, stage 1 conf vol	vC2, stage 2 conf vol	vCu, unblocked vol	tC, single (s)	tC, 2 stage (s)	tF (s)	p0 queue free %	cM capacity (veh/h)	Direction, Lane #	Volume Total	Volume Left	Volume Right	cSH	Volume to Capacity	Queue Length 95th (m)	Control Delay (s/veh)	Lane LOS	Approach Delay (s/veh)	Approach LOS	Intersection Summary	Average Delay	notarilal History actional

Proposed Residential Development 20 Cairns Crescent, Huntsville Synchro 12 Report Trans-Plan Page 5

HCM Unsignalized Intersection Capacity Analysis <2028 Total> Weekday PM Peak Hour 6: Kitchen Road South/Kithcen Road South & Main Street West/Main StreetWest 08/18/2025

			•				-	-				
Movement	EB	EBT	EBR	WBL	WBT	WBR	图	NBT	NBR	SBL	SBT	SBR
Lane Configurations	*	2		×	*			4			£,	
Traffic Volume (veh/h)	7	630	<b>∞</b>	106	538	0	7	.ო	92	0	5	0
Future Volume (Veh/h)	7	630	∞	106	238	0	7	က	92	0	7	0
Sign Control		Free			Free			Stop			Stop	
Grade		%0			%0			%0			%0	
Peak Hour Factor	0.88	0.88	0.88	0.93	0.93	0.93	0.50	0.50	0.50	0.38	0.38	0.38
Hourly flow rate (vph)	8	716	6	114	278	0	14	9	190	0	2	0
Pedestrians								2				
Lane Width (m)								3.6				
Walking Speed (m/s)								1.2				
Percent Blockage								0				
Right turn flare (veh)												
Median type	ĺ	TWLTL			None							
Median storage veh)		2										
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	278			727			1547	1545	723	1731	1549	578
vC1, stage 1 conf vol							739	739		908	908	
vC2, stage 2 conf vol							808	908		925	743	
vCu, unblocked vol	218			727			1547	1545	723	1731	1549	578
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	66			87			92	86	26	100	88	9
cM capacity (veh/h)	1006			884			256	275	429	62	243	519
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	8	725	114	578	210	5						
Volume Left	∞	0	114	0	4	0						
Volume Right	0	တ	0	0	190	0						
SSH	1006	1700	884	1700	404	243						
Volume to Capacity	0.01	0.43	0.13	0.34	0.52	0.02						
Queue Length 95th (m)	0.2	0.0	3.5	0.0	23.2	0.5						
Control Delay (s/veh)	8.6	0.0	9.7	0.0	23.1	20.1						
Lane LOS	∢		∢		O	O						
Approach Delay (s/veh)	0.1		9.		23.1	20.1						
Approach LOS					ပ	ပ						
Intersection Summary												
Average Delay			3.7									
Intersection Capacity Utilization	tion		62.1%	೦	U Level o	ICU Level of Service			Ф			
1000												

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HCM Unsignalized Intersection Capacity Analysis <2028 Total> Weekday PM Peak Hour 7: Kitchen Road South & Cairns Crescent

7: Kitchen Road South & Cairns Crescent	th & C	airns (	rescel	뉟			08/18/2025
	•	<u> </u>	•	<b>←</b>	<b>→</b>	`	
Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations	×			÷	¢		
Traffic Volume (veh/h)	19	137	82	74	20	31	
Future Volume (Veh/h)	13	137	82	7	ನ	31	
Sign Control	Stop			Free	Free		
Grade	%0			%0	%0		
Peak Hour Factor	0.50	0.50	0.69	69.0	0.75	0.75	
Hourly flow rate (vph)	38	274	119	107	27	41	
Pedestrians	7				-		
Lane Width (m)	3.6				3.6		
Walking Speed (m/s)	1.2				1.2		
Percent Blockage	0				0		
Right turn flare (veh)							
Median type				None	None		
Median storage veh)							
Upstream signal (m)							
pX, platoon unblocked							
vC, conflicting volume	396	20	2				
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	396	20	20				
tC, single (s)	6.4	6.2	4.1				
tC, 2 stage (s)							
tF(s)	3.5	33	2.2				
p0 queue free %	93	73	92				
cM capacity (veh/h)	292	1023	1541				
Direction, Lane #	EB 1	NB 1	SB 1				
Volume Total	312	226	89				
Volume Left	38	119	0				
Volume Right	274	0	41				
CSH	931	1541	1700				
Volume to Capacity	0.34	0.08	0.04				
Queue Length 95th (m)	11.9	2.0	0.0				
Control Delay (s/veh)	10.8	43	0.0				
Lane LOS	Ф	∢					
Approach Delay (s/veh)	10.8	4.3	0.0				
Approach LOS	മ						
Intersection Summary							
Average Delay			7.2				
Intersection Capacity Utilization	_		31.3%	<u>ರ</u>	ICU Level of Service	Service A	
Analysis Period (min)			15				

Proposed Residential Development 20 Cairns Crescent, Huntsville Synchro 12 Report Trans-Plan Page 7

HCM Unsignalized Intersection Capacity Analysis<2033 Background> Weekday AM Peak Hour 08/18/2025 1: Aspin Road/Aspdin Road & Highway 11 Southbound On/Off-Ramp

HCM Unsignalized Intersection Capacity Analysis<2033 Background> Weekday AM Peak Hour

2: Highway 11 Northbound On/Off-Ramp & Aspdin Road/Main Street West

08/18/2025

SBT

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190

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158 158

176

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Future Volume (Veh/h) raffic Volume (veh/h)

Sign Control

Lane Configurations

0.92

0.92 0

0.81

0.81

0.93

0.00

0.88

0.88 0

Peak Hour Factor Hourly flow rate (vph) Pedestrians

Lane Width (m)
Walking Speed (m/s)
Percent Blockage

Right turn flare (veh)

Median type

0.0

Stop 0% 0.92

Stop 0% 0.81

304 304 Free 0% 0.93 327

340 340 0% 0.88 386

																																								4	
•	SBR		148	148			69.0	214										198			198	6.2		3.3	75	840														of Service	
بر ر	WBR SBL	X K		148 162	Stop		0.94 0.69	2	2	3.6	1.2	0						658			658	6.5		3.6	43	412	WB 2 SB 1				1700 544		0.0	0.0 35.7	ш	35.7	ш			ICU Level of Service	
<b>↓</b>	WBT W		·	Ì	Free		0.94 0							None													WB 1 W	`	0				0.0			0.0			13.1	43.3%	15
†	EBT	*	354	354	Free	%0	0.85	416						None													EB 2	416	0	0	1700	0.24	0.0	0.0							
1	EBF	<u></u>	19	19			0.85	22										198			198	4.6		2.6	88	1142	EB 1	22	22	0	1142	0.02	0.5	8.2	⋖	0.4				zation	
	Movement	Lane Configurations	Traffic Volume (veh/h)	Future Volume (Veh/h)	Sign Control	Grade	Peak Hour Factor	Hourly flow rate (vph)	Pedestrians	Lane Width (m)	Walking Speed (m/s)	Percent Blockage	Right turn flare (veh)	Median type	Median storage veh)	Upstream signal (m)	pX, platoon unblocked	vC, conflicting volume	vC1, stage 1 conf vol	vC2, stage 2 conf vol	vCu, unblocked vol	tC, single (s)	tC, 2 stage (s)	tF (s)	p0 queue free %	cM capacity (veh/h)	Direction, Lane #	Volume Total	Volume Left	Volume Right	SSH	Volume to Capacity	Queue Length 95th (m)	Control Delay (s/veh)	Lane LOS	Approach Delay (s/veh)	Approach LOS	Intersection Summary	Average Delay	Intersection Capacity Utilization	Analysis Period (min)

332

718

953

386

718

713

386

332

332

718

953

386

718

713

386

332

Median storage veh)
Upstream signal (m)
pX, platron unblocked
vC, conflicting volume
vC1, stage 1 conf vol
vC2, stage 2 conf vol
vCu, unblocked vol

None

None

3.3

4.0 100 357

3.5 100 153

3.4 64 647

4.0 100 357

300

2.2 100 1184

2.2 100 1239

tC, single (s)
tC, 2 stage (s)
tF (s)
p0 queue free %
cM capacity (veh/h)

386

Volume Total Volume Left Volume Right

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ICU Level of Service

3.3 37.6% 15

Intersection Capacity Utilization Analysis Period (min)

265 30 235 572 572 0.46 119.5 16.6 C

0.10 0.10 0.00 0.0

0 0.19 0.0 0.0

0.00 0.00 0.00 0.00

0.23

cSH Volume to Capacity Queue Length 95th (m) Control Delay (s/veh)

0.0

0.0

Approach Delay (s/veh) Approach LOS

HCM Unsignalized Intersection Capacity Analysis<2033 Background> Weekday AM Peak Hour 3: Cairns Drive & Main Street West

HCM Unsignalized Intersection Capacity Analysis<2033 Background> Weekday AM Peak Hour ناوبانا و المالية الم

SBR 148 148 0.82

0.60

Free 0% 0.60 7

Free 0% 0.93 4

101

Peak Hour Factor
Hourly flow rate (vph)
Pedestrians
Lane Width (m)
Walking Speed (m/s)
Percent Blockage
Right turn flare (veh)

Stop 0% 0.82 50

137

94

Lane Configurations Traffic Volume (veh/h) Future Volume (Veh/h) Sign Control

Movement ane Configurations												
diretions	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
9444	*	+	K	×	\$		<i>y</i>	¢			4	
raffic Volume (veh/h)	167	317	47	142	293	146	177	0	53	136	0	116
-uture Volume (Veh/h)	167	317	47	142	293	146	177	0	53	136	0	116
Sign Control		Free			Free			Stop			Stop	
		%0			%0			%0			%0	
Peak Hour Factor	0.93	0.93	0.93	0.80	0.88	0.88	0.36	0.36	09.0	0.00	0.93	0.93
Hourly flow rate (vph)	180	341	21	178	333	166	492	0	88	151	0	125
Pedestrians		7						2				
ane Width (m)		3.6						3.6				
Valking Speed (m/s)		1.2						1.2				
Percent Blockage		0						0				
Right turn flare (veh)												
Median type		None		ľ	TWLTL							
Median storage veh)					2							
Jostream signal (m)												
oX, platoon unblocked												
/C, conflicting volume	499			397			1522	1561	346	1561	1529	418
C1, stage 1 conf vol							902	902		772	772	
AC2, stage 2 conf vol							816	855		789	757	
/Cu, unblocked vol	499			397			1522	1561	346	1561	1529	418
C, single (s)	4.1			4.1			7.1	6.5	6.2	7.2	6.5	6.3
C, 2 stage (s)							6.1	2.5		6.2	2.5	
	2.2			2.2			3.5	4.0	3.3	3.6	4.0	3.4
p0 queue free %	83			84			0	100	87	0	100	80
oM capacity (veh/h)	1065			1141			20	133	669	06	158	619
Direction, Lane #	EB 1	EB 2	EB3	WB 1	WB 2	NB 1	NB 2	SB 1				
/olume Total	180	341	51	178	499	492	88	276				
/olume Left	180	0	0	178	0	492	0	151				
/olume Right	0	0	51	0	166	0	88	125				
	1065	1700	1700	1141	1700	2	669	146				
/olume to Capacity	0.17	0.20	0.03	0.16	0.29	2.06	0.13	1.89				
Queue Length 95th (m)	4.9	0.0	0.0	4.4	0.0	Ē	3.4	168.9				
Control Delay (s/veh)	9.1	0.0	0.0	8.7	0.0	Ē	10.9	475.1				
	∢			∢		ட	Ф	ш				
Approach Delay (s/veh)	5.9			2.3		8483.6		475.1				
pproach LOS						ட		ட				
ntersection Summary												
Average Delay			2401.3									
ntersection Capacity Utilization	tion		65.0%	೦	U Level o	ICU Level of Service			ပ			
Analysis Period (min)			15									

3.3 81 928

3.5 92 613

2.3 92 1298

230 50 180 835 0.28 9.0 10.9 B

Volume Total
Volume Left
Volume Left
Sch
Sch
Volume to Capacity
Control Delay (siven)
Lane LOS
Approach Delay (siveh)
Approach LOS

0.0

235 0 228 1700 0.14 0.0

105

121 6.2

327

235

Muclan storage veh)
Upstream storage veh)
Upstream signal (m)
Dx. plation unblocked
v.C. conflicting volume
v.C. stage 1 conf vol
v.C., stage 2 conf vol
v.C., single (s)
f.C. stage (s)
f.C. stage (s)
f.C. stage (s)
Oqueue free %
cM capacity (vehh)

12

327

235

None None

Median type

Synchro 12 Report Page 3 Proposed Residential Development 20 Caims Crescent, Huntsville Trans-Plan

Development 2	
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12 Report	Page 4
Synchro '	

Proposed Residential Development 20 Cairns Crescent, Huntsville	(C)
Trans-Plan	

ICU Level of Service

5.8 35.5% 15

Average Delay Intersection Capacity Utilization Analysis Period (min)

HCM Unsignalized Intersection Capacity Analysis<2033 Background> Weekday AM Peak Hour 08/18/2025 5: Access & Cairns Crescent

HCM Unsignalized Intersection Capacity Analysis<2033 Background> Weekday AM Peak Hour 6. Kitchen Road South/Kithcen Road South & Main Street West/Main StreetWest 08/18/2025 0.75

0

0.64

0.64

0.88

0.88

0.78

0.78

Peak Hour Factor Hourly flow rate (vph) Pedestrians Lane Width (m) Walking Speed (m/s) Percent Blockage

551 551 Free 0% 0.88 626

467 467 467 Free 0% 0.78 599

23 23

16

Traffic Volume (veh/h) Future Volume (Veh/h) Sign Control

Lane Configurations

0

3.6

3.6

None

TWLTL 2

Right turn flare (veh)

Median type

621

626

Median storage veh)
Upstream signal (m)
pX, platron unblocked
vC, conflicting volume
vC1, stage 1 conf vol
vC2, stage 2 conf vol
vCu, unblocked vol

Stop 0% 0.75

Stop 0% 0.64

SBL

NBR

層

WBR

EBR

8 8

626 6.2 3.3 99 488

3.3 85 496

2.2 97 969

2.2 100 965

tC, single (s)
tC, 2 stage (s)
tF (s)
p0 queue free %
cM capacity (veh/h)

692 629 1321 6.5 6.5 7.0 100 334

692 683 1375 7.1 6.1 3.5 100 276

612 6.2

619 692 1311 6.5 5.5 4.0 100

1314 695 695 7.1 7.1 6.1 3.5 97

621

626

	†	<i>&gt;</i>	<b>\</b>	ţ	•	•	
Movement	EBT	EBR	WBL	WBT	NBL	NBR	
Lane Configurations	æ			÷	Þ		
Traffic Volume (veh/h)	0	0	0	0	0	0	
Future Volume (Veh/h)	0	0	0	0	0	0	
Sign Control	Free			Free	Stop		
Grade	%0			%0	%0		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	0	0	0	0	0	0	
Pedestrians							
Lane Width (m)							
Walking Speed (m/s)							
Percent Blockage							
Right turn flare (veh)							
	None			None			
Median storage veh)							
Upstream signal (m)							
pX, platoon unblocked							
vC, conflicting volume			0		0	0	
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol			0		0	0	
tC, single (s)			4.1		6.4	6.2	
tC, 2 stage (s)							
tF(s)			2.2		3.5	3.3	
p0 queue free %			100		100	100	
cM capacity (veh/h)			1623		1023	1085	
Direction, Lane #	EB 1	WB 1	NB 1				
Volume Total	0	0	0				
Volume Left	0	0	0				
Volume Right	0	0	0				
cSH	1700	1700	1700				
Volume to Capacity	0.00	0.00	0.00				
Queue Length 95th (m)	0.0	0.0	0.0				
Control Delay (s/veh)	0.0	0.0	0.0				
Lane LOS			∢				
Approach Delay (s/veh)	0.0	0.0	0.0				
Approach LOS			⋖				
Intersection Summary							
Average Delav			0.0				
Intersection Capacity Utilization			%0.0	ਠ	ICU Level of Service	Service	A
Analysis Period (min)			15				
,							

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esidential D	
oposed R	ans-Plan

ICU Level of Service

1.1 44.6% 15

Intersection Capacity Utilization Analysis Period (min)

3 488 0.01 0.1 12.4 12.4 B B

9 9 75 77 471 0.18 5.1 B B B

33 33 00 0.03 0.8 8.8 8.8

0.00 0.00 0.1 8.7 A A

Volume Total
Volume Left
Volume Left
Volume Right
SSH
Volume to Capacity
Queue Length 95th (m)
Control Delay (siveh)
Lane LOS
Approach Delay (siveh)
Approach LOS

21 1700 0.36 0.0

0 0 1700 0.37 0.0

HCM Unsignalized Intersection Capacity Analysis<2033 Background> Weekday AM Peak Hour 7: Kitchen Road South & Cairns Crescent

																																							A	
	œ	g	9			0	10																																rice	
*	SBR					0																																	of Sen	
-	SBT	<b>₹</b> .%	23	Free	%0	09.0	38	က	3.6	1.2	0		None																										ICU Level of Service	
<b>←</b>	NBT	<b>₽</b> 2	45	Free	%0	0.65	69	17	3.6	1.2	-		None																										≗	
•	NBL	135	135			0.65	208										62			62	4.1		2.2	98	1536	SB 1	48	0	10	1700	0.03	0.0	0.0		0.0			6.4	31.3%	15
<i>&gt;</i>	EBR	40	9			0.50	80										74			74	7.2		4.2	83	752	NB 1	277	208	0	1536	0.14	3.7	6.1	∢	6.1					
4	EB	<b>}</b> _10	വ	Stop	%0	0.50	10	14	3.6	1.2	-						545			545	6.4		3.5	86	424	EB 1	06	10	80	692	0.13	3.6	11.0	В	11.0	В			L	
	Movement	-ane Configurations Fraffic Volume (veh/h)	Future Volume (Veh/h)	Sign Control	Grade	Peak Hour Factor	Hourly flow rate (vph)	Pedestrians	-ane Width (m)	Nalking Speed (m/s)	Percent Blockage	Right turn flare (veh)	Median type	Median storage veh)	Jpstream signal (m)	pX, platoon unblocked	vC, conflicting volume	/C1, stage 1 conf vol	vC2, stage 2 conf vol	/Cu, unblocked vol	C, single (s)	C, 2 stage (s)	IF (s)	p0 queue free %	cM capacity (veh/h)	Direction, Lane #	/olume Total	/olume Left	/olume Right	SSH	/olume to Capacity	Queue Length 95th (m)	Control Delay (s/veh)	ane LOS	Approach Delay (s/veh)	Approach LOS	ntersection Summary	Average Delay	ntersection Capacity Utilization	Analysis Period (min)

Proposed Residential Development 20 Cairns Crescent, Huntsville Synchro 12 Report Trans-Plan Page 7

HCM Unsignalized Intersection Capacity Analysis<2033 Background> Weekday PM Peak Hour 1: Aspin Road/Aspdin Road & Highway 11 Southbound On/Off-Ramp

HCM Unsignalized Intersection Capacity Analysis<2033 Background> Weekday PM Peak Hour

2: Highway 11 Northbound On/Off-Ramp & Aspdin Road/Main Street West

08/18/2025

SBT

SBL

NBR

WBR

EBR

/

284

**5** 54

261 261

<del>1</del>35

0 0

Traffic Volume (veh/h) Future Volume (Veh/h)

Sign Control

Lane Configurations

457 457 Free 0% 0.89 513

470 470 Free 0% 0.83

0.92

0.92

0.83

0.83

0.89

0.89

0.83

0.83

Peak Hour Factor Hourly flow rate (vph) Pedestrians

Lane Width (m)
Walking Speed (m/s)
Percent Blockage

Right turn flare (veh)

Median type

Stop 0% 0.83

Stop 0% 0.92 513

1079

1421

999

1079

1079

566

513

Median storage veh)
Upstream signal (m)
pX, platron unblocked
vC, conflicting volume
vC1, stage 1 conf vol
vC2, stage 2 conf vol
vCu, unblocked vol

None

None

**513** 6.2

1079

1421

566

1079

1079

566 4.1

513

3.3 100 565

4.0 220

3.5

3.3 35 526

4.0 100 220

3.6 85 188

2.2 100 1016

2.2 100 1063

tC, single (s)
tC, 2 stage (s)
tF (s)
p0 queue free %
cM capacity (veh/h)

																																								A
<b>\</b>	SBR		188	188			0.91	207										271			271	6.2		3.3	73	765														of Service
و ا	WBR SBL		246 130		Stop		0.87 0.91	283 143										1015			1015	6.4		3.5	44	257	WB 2 SB 1				1700 424		0.0 61.9	42	ш	42.8	ш			ICU Level of Service
ţ	WBT		236		Free									None													WB1 W	271					0.0	0.0		0.0			9.4	53.5%
†	EBT	*	534	534	Free	%0	0.77	694						None													EB 2	694	0	0	1700	0.41	0.0	0.0						
1	EBL	F	19	19			0.77	25										271			271	4.3		2.4	86	1195	EB 1	22	22	0	1195	0.02	0.5	 	∢	0.3				ы
	Movement	Lane Configurations	Traffic Volume (veh/h)	Future Volume (Veh/h)	Sign Control	Grade	Peak Hour Factor	Hourly flow rate (vph)	Pedestrians	Lane Width (m)	Walking Speed (m/s)	Percent Blockage	Right turn flare (veh)	Median type	Median storage veh)	Upstream signal (m)	pX, platoon unblocked	vC, conflicting volume	vC1, stage 1 conf vol	vC2, stage 2 conf vol	vCu, unblocked vol	tC, single (s)	tC, 2 stage (s)	tF (s)	p0 queue free %	cM capacity (veh/h)	Direction, Lane #	Volume Total	Volume Left	Volume Right	cSH	Volume to Capacity	Queue Length 95th (m)	Control Delay (s/veh)	Lane LOS	Approach Delay (s/veh)	Approach LOS	Intersection Summary	Average Delay	Intersection Capacity Utilization

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ICU Level of Service

7.1 50.3%

Average Delay Intersection Capacity Utilization Analysis Period (min)

371 29 342 461 0.80 59.5 37.8 E E E

293 293 1700 0.17 0.0

> 0 0.30 0.0 0.0

235 0 235 0.14 0.0

0.33

cSH Volume to Capacity Queue Length 95th (m) Control Delay (s/veh)

999

Volume Total Volume Left Volume Right 0.0

0.0

Approach Delay (s/veh) Approach LOS

HCM Unsignalized Intersection Capacity Analysis<2033 Background> Weekday PM Peak Hour 3: Cairns Drive & Main Street West

HCM Unsignalized Intersection Capacity Analysis<2033 Background> Weekday PM Peak Hour ن ۲۰۰۰ منیمت • ∩ منیمه 08/18/2025

0.86

0.88

60% 0.88 5

6.0% 0.80 5

0.80

Peak Hour Factor
Hourly flow rate (vph)
Pedestrians
Lane Width (m)
Walking Speed (m/s)
Percent Blockage
Right turn flare (veh)

46

88 88

131

Traffic Volume (veh/h) Future Volume (Veh/h) Sign Control

Lane Configurations

SBL 139 139 139 0% 0.86 162

SBR

> → → → ← →	3L NBT NBR SBL SBT SBR	4	12 0 77 157 0 191	0 77 157 0	Stop	%0	0.70 0.70	0 110 185 0										1595 586 1643 1	866 667	729 976 1026	1595 586 1643	6.5 6.2 7.1 6.5	5.5 6.1	4.0 3.3 3.5 4.0	100 79 0	215 514 143 197	2 SB1		0 185		14 238			.9 377.0	В	377.0	ш			
€	NBL	*	142				0.70											1696	998	830	1696	7.1	6.1	3.5	0	26	NB 2	1				_		. 13.9					ĺ	
<b>√</b>	T WBR		9 114	9 114	o.		2 0.92								2												2 NB 1	3 203			) 56				L	6489.9	L			
<b>+</b>	L WBT	£	49 459		Free		12 0.92							TWLTL	.,			e			746	4.1		2.2	4	<del>-</del>	1 WB2	•	53 0		.1 1700		1.6 0.0		∢	7.				
<b>*</b>	R WBI	R.		136 4			0.85 0.92											746			74	4		2	94	87	3 WB1				00 871	_				0				
•	3T EBR	L	498 13	ľ	Free	%0								e.													EB 2 EB 3		0				0.0 0.0							
_   	EBL EBJ	سا	119 49		Ē									None				623			623	4.1		2.2	98	89	EB 1 EB		140		968 17			9.3 0	⋖	5				
7	ā		_	_			Ö	<u>_</u>										9			9	4		. 4		6	EE	-	-		Ó	0	7	0,		,-				
	Movement	Lane Configurations	Traffic Volume (veh/h)	Future Volume (Veh/h)	Sign Control	Grade	Peak Hour Factor	Hourly flow rate (vph)	Pedestrians	Lane Width (m)	Walking Speed (m/s)	Percent Blockage	Right turn flare (veh)	Median type	Median storage veh)	Upstream signal (m)	pX, platoon unblocked	vC, conflicting volume	vC1, stage 1 conf vol	vC2, stage 2 conf vol	vCu, unblocked vol	tC, single (s)	tC, 2 stage (s)	tF (s)	p0 queue free %	cM capacity (veh/h)	Direction, Lane #	Volume Total	Volume Left	Volume Right	cSH	Volume to Capacity	Queue Length 95th (m)	Control Delay (s/veh)	Lane LOS	Approach Delay (s/veh)	Approach LOS	Intercontion Cummons	Illersection Summary	

3.3 95 1018

3.5 70 543

2.2 89 1493

55 6.2

388

105

Muclan storage veh)
Upstream storage veh)
Upstream signal (m)
Dx. plation unblocked
v.C. conflicting volume
v.C. stage 1 conf vol
v.C., stage 2 conf vol
v.C., single (s)
f.C. stage (s)
f.C. stage (s)
f.C. stage (s)
Oqueue free %
cM capacity (vehh)

22

388

105

None None

Median type

Proposed Residential Development 20 Cairns Crescent, Huntsville Synchro 12 Report Trans-Plan Page 3

Residential Development 20 Cairns Creso	<b>=</b>
Proposed Residenti	Trans-Plan

cent, Huntsville

ICU Level of Service

8.8 31.3% 15

Average Delay Intersection Capacity Utilization Analysis Period (min)

215 162 53 613 0.35 12.6 14.0 B

> 0 1493 0.11 3.0 7.5 A A 7.5

Volume Total
Volume Left
Volume Left
Sch
Sch
Volume to Capacity
Oueue Length 95th (m)
Control Delay (siveh)
Lane LOS
Approach Delay (siveh)
Approach LOS

0.0

0.06 0.06 0.00 0.00

169 164

HCM Unsignalized Intersection Capacity Analysis<2033 Background> Weekday PM Peak Hour 08/18/2025 5: Access & Cairns Crescent

HCM Unsignalized Intersection Capacity Analysis<2033 Background> Weekday PM Peak Hour 6: Kitchen Road South/Kithcen Road South & Main Street West/Main StreetWest 08/18/2025 0.38

0

0.38

0.50

0.50

0.93

0.93

0.88

0.88 6

Peak Hour Factor Hourly flow rate (vph) Pedestrians

Lane Width (m)
Walking Speed (m/s)
Percent Blockage

Right turn flare (veh)

Median type

6 3.6 0

None

TWLTL 2

Stop 0% 0.38

Stop 0% 0.50

588 588 Free 0% 0.93 632

689 689 689 Free 0% 0.88

83 83

Traffic Volume (veh/h) Future Volume (Veh/h)

Sign Control

Lane Configurations

SBL

NBR

BE

WBR

EBR

/

2 2

	†	<u> </u>	<b>&gt;</b>	ţ	•	•	
Movement	EBT	EBR	WBL	WBT	NBL	NBR	
Lane Configurations	æ			¥	×.		
Traffic Volume (veh/h)	0	0	0	0	0	0	
Future Volume (Veh/h)	0	0	0	0	0	0	
Sign Control	Free			Free	Stop		
Grade	%0			%0	%0		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	0	0	0	0	0	0	
Pedestrians							
Lane Width (m)							
Walking Speed (m/s)							
Percent Blockage							
Right turn flare (veh)							
	None			None			
Median storage veh)							
Upstream signal (m)							
pX, platoon unblocked							
vC, conflicting volume			0		0	0	
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol			0		0	0	
tC, single (s)			4.1		6.4	6.2	
tC, 2 stage (s)							
tF (s)			2.2		3.5	3.3	
p0 queue free %			100		100	100	
cM capacity (veh/h)			1623		1023	1085	
Direction, Lane #	EB 1	WB 1	NB 1				
Volume Total	0	0	0				
Volume Left	0	0	0				
Volume Right	0	0	0				
CSH	1700	1700	1700				
Volume to Capacity	0.00	0.00	0.00				
Queue Length 95th (m)	0.0	0.0	0.0				
Control Delay (s/veh)	0.0	0.0	0.0				
Lane LOS			∢				
Approach Delay (s/veh)	0.0	0.0	0.0				
Approach LOS			⋖				
Intersection Summary							
Average Delay			0.0				
Intersection Capacity Utilization			%0.0	<u>0</u>	ICU Level of Service	Service	×
Analysis Period (min)			15				

632 6.2 3.3 100 484

3.3 59 393

2.2 89 834

2.2 99 960

tC, single (s)
tC, 2 stage (s)
tF (s)
p0 queue free %
cM capacity (veh/h)

6.5 6.5 6.5 843 6.5 6.5 7.0 80 240

966 97.1 7.1 6.1 3.5 100 84

808 808 810 1618 6.5 5.5 4.0 98 268

1621 808 813 1621 7.1 6.1 3.5 94 248

4.1

632

790

632

290

795

632

Median storage veh)
Upstream signal (m)
pX, platron unblocked
vC, conflicting volume
vC1, stage 1 conf vol
vC2, stage 2 conf vol
vCu, unblocked vol

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Proposed Residential Development 20 Cairns	Development 20	Cairns
Trans-Plan		

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ICU Level of Service

3.2 63.7% 15

Intersection Capacity Utilization Analysis Period (min)

0.02 0.02 0.5 20.3 C

184 162 368 0.50 0.50 C C C

89 834 0.11 2.9 9.8 4 A

0.01 0.02 0.2 8.8 A A

cSH
Volume to Capacity
Queue Length 95th (m)
Control Delay (s/veh)
Lane LOS
Approach Delay (s/veh)
Approach LOS

632 0 0 1700 0.37 0.0

793 10 1700 0.47 0.0

Volume Total Volume Left Volume Right

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HCM Unsignalized Intersection Capacity Analysis<2033 Background> Weekday PM Peak Hour 7: Kitchen Road South & Cairns Crescent

Movement Lane Configurations Traffic Volume (veh/h)						
Lane Configurations Traffic Volume (veh/h)	田田	EBR	NBL	NBT	SBT	SBR
Traffic Volume (veh/h)	>			₩	£	
	က	138	83	75	55	9
ne (Veh/h)	3	138	83	75	22	9
Sign Control	Stop			Free	Free	
	%0			%0	%0	
	0.50	0.50	69.0	69.0	0.75	0.75
ate (vph)	9	276	120	109	59	80
Pedestrians	7				-	
Lane Width (m)	3.6				3.6	
Walking Speed (m/s)	1.2				1.2	
Percent Blockage	0				0	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	385	32	36			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	385	32	33			
tC, single (s)	6.4	6.2	4			
tC, 2 stage (s)	ı	0	0			
tF (s)	3.5	e :	2.2			
p0 queue free %	66	74	95			
cM capacity (veh/h)	573	1042	1581			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	282	229	37			
	9	120	0			
ne Right	276	0	∞			
	1024	1581	1700			
	0.28	0.08	0.02			
Queue Length 95th (m)	9.0	2.0	0.0			
Control Delay (s/veh)	8. 6	4.2	0.0			
Lane LOS	∢	∢				
Approach Delay (s/veh)	8.6	4.2	0.0			
Approach LOS	∢					
Intersection Summary						
Average Delay			8.9			
Intersection Capacity Utilization			30.6%	<u>ರ</u>	J Level o	ICU Level of Service A
Analysis Period (min)			2			

Proposed Residential Development 20 Cairns Crescent, Huntsville Synchro 12 Report Trans-Plan Page 7

HCM Unsignalized Intersection Capacity Analysis <2033 Total> Weekday AM Peak Hour 1: Aspin Road/Aspdin Road & Highway 11 Southbound On/Off-Ramp 08/18/2025

HCM Unsignalized Intersection Capacity Analysis <2033 Total> Weekday AM Peak Hour 2: Highway 11 Northbound On/Off-Ramp & Aspdin Road/Main Street West 08/18/2025

094 069 0.69 166 238 214 5 3.6 1.2 0 669 206 669 206 6.5 6.2 3.6 3.3 41 74 405 831 41 74 405 831 700 538 0.0 0.84 0.0 38.2 E 38.2 E 1CU Level of Service A
238 214 5 3.6 1.2 0 669 206 6.5 6.2 3.6 3.3 41 74 405 831 538 214 538 70.6 83.2 E 83.2 E 538.2
1.2 669 206 669 206 6.5 6.2 3.6 3.3 41 74 405 831 442 238 214 536 0.84 70.6 38.2 E E 8.2 E 8.2 E 8.2 E 8.3 E 8.4 E 8.5 E 8.5 E 8.6 E 8.7 E 8.8 E 8.8 E 8.8 E 8.8 E 8.8 E 8.8 E 8.8 E 8.8 E 8.8 E 8.2 E 8.2 E 8.2 E 8.2 E 8.2 E 8.3 E 8.4 E 8.5 E 8.6 E 8
669 206 669 206 6.5 6.2 3.6 6.2 47 445 831 482 238 214 638 C0.84 70.6 38.2 E E E E CU Level of Service
669 206 669 206 6.5 6.2 3.6 3.3 4.1 74 405 831 SB1 538 214 70.6 38.2 E 38.2 E 38.2 E 38.2 CLU Level of Service
669 206 669 206 6.5 6.2 3.6 3.3 41 74 405 831 881 452 238 214 536 0.84 70.6 38.2 E 38.2 E 38.2
669 206 6.5 6.2 3.6 3.3 4.1 74 405 831 238 214 6.84 70.6 38.2 E E 38.2 E
669 206 6.5 6.2 3.6 3.3 4.1 74 405 831 8B.1 452 238 214 6.84 70.6 38.2 E E S38.2 E E S38.2 E E S38.2 E E S38.2 E E S38.2 E E S38.2 E E S38.2 E E S38.2 E E S38.2 E E S38.2 E E S38.2 E E S38.2 E S38.2 E E S38.2 E E S38.2 E E S38.2 E E S38.2 E E E E E E E E E E E E E E E E E E E
6.5 6.2 3.6 3.3 41 74 405 831 288 238 214 638 70.6 38.2 E E E S8.2 E
3.6 3.3 41 74 405 831 <b>SB1</b> 452 238 214 536 0.84 70.6 38.2 E 8.2 8.2 E 38.2 E 38.2 CU Level of Service
41 74 405 831 881 452 238 214 536 0.84 70.6 38.2 E 38.2 E 38.2 E 38.2 CU Level of Service
SB1 452 452 238 214 535 0.84 70.6 38.2 E 38.2 E 38.2 E 38.2 CU Level of Service
452 238 214 535 0.84 70.6 38.2 E 38.2 E 38.2 E
238 214 535 0.84 70.6 38.2 E 38.2 E
214 535 0.84 70.6 38.2 E 38.2 E CUL avel of Service
0.84 70.6 38.2 E 38.2 E CUL avel of Service
70.6 38.2 5.2 E E CU Level of Service
38.2 8.2 E E CU Level of Service
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Proposed Residential Development 20 Cairns Crescent, Huntsville Synchro 12 Report Trans-Plan Page 1

FBL   EBT   EBR   WBL   WBT   WBR   NBL   NBT   NBR   SBL   SBT   SBT				-	•			-		•			
orifigurations		EBL	EBI	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Colume (vehh)         0         343         176         0         319         163         24         0         193         0         0           Owlume (vehh)         Reg         Free         Free         Stop         193         0         0           Owlume (vehh)         Reg         0.98         0.98         0.99         0.93	Lane Configurations		*	R.		*	¥.		>				
Ovolume (Vehith)         0         343         176         0         319         163         24         0         183         0         0           own reactor         0.88         0.88         0.89         0.90         0.93         0.83         0.81         0.84         0.89         0.90         0.93         0.83         0.81         0.84         0.89         0.80<	Traffic Volume (veh/h)	0	343	176	0	319	163	54	.0	193	0	0	0
our Factor         Free         Stop         Stop         Stop         Stop         Stop         O%         O	Future Volume (Veh/h)	0	343	176	0	319	163	24	0	193	0	0	0
our Factor         0.88         0.98         0.08         0.08         0.08         0.08         0.08         0.09         0.00	Sign Control		Free			Free			Stop			Stop	
Hour Factor 0.88 0.88 0.88 0.99 0.93 0.93 0.81 0.81 0.81 0.92 0.92 0.92 0.92 0.93 0.90 0.93 0.93 0.81 0.81 0.81 0.82 0.92 0.92 0.93 0.90 0.93 0.93 0.93 0.93 0.93 0.93			%0			%0			%0			%0	
March   Marc		0.88	0.88	0.88	0.00	0.93	0.93	0.81	0.81	0.81	0.92	0.92	0.92
Width (ms)         None         1.2           Width (ms)         None         None         1.2           In Ipockage (mis)         None         None         1.2           and signal (m)         American signal (m)         American signal (m)         American signal (m)         American signal (m)           and signal (m)         American signal (m)	Hourly flow rate (vph)	0	390	200	0	343	175	30	0	238	0	0	0
Width (m)         Width (m)           Width (m)         Width (m)           width (ms)         None         12           rt Blocksge         None         None         12           num blocksge         Mone         None         12           num storage with         348         390         733         738         390         976         738           ama signal (m)         348         390         733         738         390         976         738           adoction unblocked with all stage 1 conf will all stage 2 conf will all stage 8.         2.2         2.2         3.9         4.0         3.4         3.5         4.0         3.4         3.5         4.0         3.4         3.5         4.0         3.4         3.5         4.0         3.4         3.5         4.0         3.4         3.5         4.0         3.4         3.5         4.0         3.4         3.5         4.0         3.4         3.5         4.0         3.4         3.5         4.0         3.4         3.5         4.0         3.4         3.5         4.0         3.4         3.5         4.0         3.4         3.5         4.0	Pedestrians											2	
12 peack (m/s)  13 peack (m/s)  14 peack (m/s)  15 peack (m/s)  16 peack (m/s)  17 peack (m/s)  18 peack (m/s)	Lane Width (m)											0.0	
turn flane (veit)  None  None  None  In Spockage  In None  In None  In Stage (s)  In S	Walking Speed (m/s)											1.2	
turn flare (veh)         None         None           nn kyce         None         None           nn kyce         348         390         773         738         390         976         738           atroon unblocked volume approach volume shorted         348         390         773         738         390         976         738           atroop conf vol         348         390         773         738         390         976         738           stage 2 conf vol         4.1         4.1         4.1         7.5         6.5         6.3         7.1         6.5           stage 2 conf vol         4.1         4.1         7.5         6.5         6.3         7.1         6.5           stage 2 conf vol         4.1         4.1         7.5         6.5         6.3         7.1         6.5           stage (s)         2.2         2.2         3.9         4.0         3.4         3.5         4.0           stage (s)         1.22         3.9         4.0         3.4         3.5         4.0           stage (s)         2.2         2.2         3.9         4.0         3.4         3.5         4.0           stage (s)         2.2	Percent Blockage											0	
In type and storage verity are are significantly action unblocked with attoon unblocked will attoon unblocked void stage 2 conf void void void stage 2 conf void void void stage 3 soo 348 attoon value free % 100	Right turn flare (veh)												
na storage veh)  ama signal (iii)  ama signal (iii)  auton unblocked  atage 1 conf vol  atage 2 conf vol  atage 3 conf vol  atage 5 conf vol  atage 6 conf vol  atage 6 conf vol  atage 6 conf vol  atage 8 conf vol  atage 1 conf vol  atage 1 conf vol  atage 1 conf vol  atage 2 conf vol  atage 3 conf vol  atage 6 conf vol  atage 2 conf vol  atage 3 conf vol  atage 2 conf vol  atage 2 conf vol  atage 3 conf vol  atage 3 conf vol  atage 2 conf v	Median type		None			None							
ama signal (m) ama signal conf vol atage 2 conf vol ambiocked vol ambiocked vol ambiocked vol ambiocked vol ambiocked vol and atage 2 conf vol atage	Median storage veh)												
ation unblocked  ation controlled by a control	Upstream signal (m)												
stage 1 conf vol stage 2 conf vol stage 348 390 773 738 738 390 976 738 stage 1 conf vol stage 2 conf vol st	oX, platoon unblocked												
stage 1 conf vol         stage 2 conf vol         stage 3 stage	vC, conflicting volume	348			330			733	738	330	926	738	348
stage 2 conf vol         348         390         733         738         390         976         738           ninbloked vol (s)         4.1         4.1         7.5         6.5         6.3         7.1         6.5           siage (s)         4.1         4.1         7.5         6.5         6.3         7.1         6.5           siage (s)         2.2         3.9         4.0         3.4         3.5         4.0         6.5           siage (s)         100         100         100         2.2         3.9         4.0         3.4         3.5         4.0           eue free free free free free free free f	/C1, stage 1 conf vol												
rublocked vol         348         390         773         738         390         976         738           sige (s)         4.1         4.1         4.1         7.5         6.5         6.3         7.1         6.5           sige (s)         2.2         2.2         3.9         4.0         3.4         3.5         4.0           sue free %         100         100         90         100         63         100         100           pacity (with)         1222         1180         3.9         4.0         3.4         3.5         4.0           pacity (with)         1222         1180         90         100         63         100         100           pacity (with)         1222         WB 1         NB 2         NB 1         A 34         4.0         3.4         4.0         3.4         4.0         100 <th< td=""><td>/C2, stage 2 conf vol</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></th<>	/C2, stage 2 conf vol												
type (s)         4.1         4.1         7.5         6.5         6.3         7.1         6.5           stage (s)         2.2         2.2         3.9         4.0         3.4         3.5         4.0           eue free %         100         100         90         100         63         100         100           pacity (vehh)         1222         1180         290         348         643         146         348           ion, Lane #         EB 1         EB 2         WB 1         NB 2         NB 6         43         146         348           ion, Lane #         EB 1         EB 2         WB 1         NB 2         NB 6         43         146         348           ion, Lane #         EB 1         EB 2         WB 1         NB 2         NB 6         43         146         348           ion Leaf elf         0         0         0         0         0         30         30         169         16	/Cu, unblocked vol	348			330			733	738	330	926	738	348
stage (s)  2.2  2.2  2.2  2.2  2.2  2.2  2.3  3.9  4.0  3.4  3.5  4.0  90  100  90  100  90  100  100  100	.C, single (s)	4.1			4.1			7.5	6.5	6.3	7.1	6.5	6.2
Long Lane #         2.2         3.9         4.0         3.4         3.5         4.0           pacity (verhft)         122         3.9         4.0         3.4         3.5         4.0           pacity (verhft)         122         WB 1         NB 1         PB 2         NB 1         AB 2         NB 3         100	C, 2 stage (s)												
100	F (s)	2.2			2.2			3.9	4.0	3.4	3.5	4.0	3.3
1222 1180 290 348 643 146 348 EB1 EB2 WB 1 WB2 NB1 290 348 643 146 348 EB1 EB2 WB 1 WB2 NB1 290 348 643 146 348 EB1 EB2 WB 1 WB2 NB1 290 348 643 146 348 EB1 EB2 WB 1 WB2 NB1 290 348 643 146 348 EB1 EB2 WB 1 WB 2 NB 1 T70		9			100			8	100	63	100	100	100
EB 1 EB 2 WB 1 WB 2 NB 1  390 200 343 175 268  0 200 0 175 268  1700 1700 1700 1700 586  0.23 0.12 0.20 0.10 0.47  n) 0.0 0.0 0.0 0.0 16.9  h) 0.0 0.0 0.0 16.9  c C		222			1180			290	348	643	146	348	700
390 200 343 175 268 0 0 0 0 0 30 1 200 0 1 0 30 1 200 0 1 0 30 1 200 0 1 0 30 1 200 0 10 0 202 1 0.23 0.12 0.20 0.10 0.47 1 0.0 0.0 0.0 0.0 16.9 1 0.0 0.0 0.0 0.0 16.9 1 0.0 0.0 0.0 16.9 1 0.0 0.0 3.3 1 0.0 0.0 0.0 16.9 1 0.0 0.0 0.0 16.9 2 0.0 0.0 0.0 16.9 2 0.0 0.0 0.0 16.9 3 0.0 0.0 0.0 16.9 3 0.0 0.0 0.0 16.9		-B	EB 2	WB 1	WB 2	NB 1							
0 0 0 0 30 0 200 0 175 238 1700 1700 1700 566 0.23 0.12 0.20 0.10 0.47 n) 0.0 0.0 0.0 0.0 16.9 c) 0.0 0.0 0.0 16.9 h) 0.0 0.0 0.0 16.9 c) 0.0 0.0 18.9 c) 0.0 0.0 18.9 Utilization 38.0% ICU Level of Service	Volume Total	330	200	343	175	268							
0 200 0 175 238 1700 1700 1700 1700 566 10.23 0.12 0.10 0.10 0.47 10) 0.0 0.0 0.0 0.0 20.2 11) 0.0 0.0 0.0 16.9 12) 0.0 0.0 0.0 16.9 13.3 CU Level of Service	Volume Left	0	0	0	0	30							
1700 1700 1700 566  10.23 0.12 0.20 0.10 0.47  10.0 0.0 0.0 0.0 20.2  10.0 0.0 0.0 0.0 16.9  10.0 0.0 0.0 16.9  10.0 0.0 18.9  10.0 0.0 0.0 16.9  10.0 0.0 18.9  10.0 0.0 0.0 18.9  10.0 0.0 0.0 18.9  10.0 0.0 0.0 18.9  10.0 0.0 0.0 18.9  10.0 0.0 0.0 0.0 18.9	ne Right	0	200	0	175	238							
n) 0.23 0.12 0.20 0.10 0.47 n) 0.0 0.0 0.0 0.0 20.2 i) 0.0 0.0 0.0 16.9 c ii) 0.0 0.0 16.9 C iii) 3.3 C C C C C C C C C C C C C		200	1700	1700	1700	266							
n) 0.0 0.0 0.0 20.2 0.0 0.0 0.0 16.9 c h) 0.0 0.0 16.9 C C C C C C C C C C C C C		0.23	0.12	0.20	0.10	0.47							
0.0 0.0 0.0 16.9 C C C A 3.3 CUtization 38.0% ICU Level of Service	Queue Length 95th (m)	0.0	0.0	0.0	0.0	20.2							
C 0.0 0.0 16.9 C C C 3.3 C IC I	Control Delay (s/veh)	0.0	0.0	0.0	0.0	16.9							
0.0 0.0 16.9 C C 3.3 Ilization 38.0% ICU Level of Service	Lane LOS					ပ							
C  3.3  Utilization 38.0% ICU Level of Service	Approach Delay (s/veh)	0.0		0.0		16.9							
3.3 Utilization 38.0% ICU Level of Service	Approach LOS					ပ							
3.3 Utilization 38.0% ICU Level of Service	Intersection Summary												
Utilization 38.0% ICU Level of Service	Average Delay			3.3									
	Intersection Capacity Utilization			38.0%	೦	U Level o	of Service			∢			

<2033 Total> Weekday AM Peak Hour 08/18/2025 HCM Unsignalized Intersection Capacity Analysis 3: Cairns Drive & Main Street West

EBL EBT EB 167 317 167 317 167 317 168 341 2 2 3 6 0 0 0 0 0 0 1065 1700 17 1085 1700 17 1085 1700 17 1085 1700 17 1085 1700 17 1085 1700 17 1085 1700 17 1087 1700 17 1087 1700 17 1087 1700 17 1087 1700 17 1088 1700 17 1088 1700 17 1089 1700 1700 1700 1700 1700 1700 1700 170		^	†	۴	<b>\</b>	ļ	4	•	<b>—</b>	•	٠	<b>→</b>	•
Ordigurations         Interest (with)         Interest (wi	Movement	图	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (verln)         167         317         53         142         283         146         187         0         53         136           Volume (verln)         167         317         53         142         283         146         187         0         53         136           Volume (verln)         167         317         53         146         187         0         53         136           Owr         00x         00x         0x8         0.88         0.88         0.88         0.86         0.90           Interest (min)         3.6         3.6         3.7         1.7         3.8         1.2         3.8         1.5           Interest (min)         3.6         3.8         0.88         0.88         0.88         0.89         1.5         1.2 <td>Lane Configurations</td> <td>*</td> <td>*</td> <td>*</td> <td>*</td> <td>2</td> <td></td> <td>*</td> <td>¢\$</td> <td></td> <td></td> <td>4</td> <td></td>	Lane Configurations	*	*	*	*	2		*	¢\$			4	
Volume (Vehh)         167         317         53         142         293         146         197         0         53         136           Annoted         Free         Free         Free         Stop         Stop         136	Traffic Volume (veh/h)	167	317	23	142	293	146	197	.0	23	136	.0	116
Prese   Prese   Stop	Future Volume (Veh/h)	167	317	23	142	293	146	197	0	23	136	0	116
Our Feator         0%         0%         0%           Our Feator         0,93         0,93         0,93         0,93         0,90           Row rate (vph)         180         3,1         5         178         333         166         547         0         89         151           ridan         2         178         33         166         547         0         89         151           ridate         3         1,2         1,2         3,6         3,6         1,2         3,6         151           In Blocked         1,2	Sign Control		Free			Free			Stop			Stop	
180 341 57 178 333 166 547 0 88 151 2 3.6 3.6 1.2 1.2 1.2 2 3.6 1.2 2 3.6 1.2 2 3.6 1.2 2 3.6 1.2 2 3.6 1.2 2 3.6 1.2 2 3.6 1.2 2 3.6 1.2 2 3.6 1.2 2 3.6 1.2 2 3.6 2 3.	Grade		%0			%0			%0			%0	
180 341 57 178 333 166 547 0 88 151 3 6 3 6 1 2 1 2 0 0 100e  1 2	Peak Hour Factor	0.93	0.93	0.93	0.80	0.88	0.88	0.36	0.36	09.0	06.0	0.93	0.93
12   12   12   12   12   12   12   12	Hourly flow rate (vph)	180	341	22	178	333	166	547	0	88	151	0	125
3.6  1.2  None  TWLTL  4.9  4.0  4.1  4.1  4.1  4.1  4.1  4.1  4.1	Pedestrians		7						2				
12 None TWLTL  499 403 1522 1561 346 1561 41 41 41 71 65 62 722 83 440 84 61 1522 1561 346 1561 706 706 706 706 706 706 706 706 706 706	Lane Width (m)		3.6						3.6				
None	Walking Speed (m/s)		1.2						1.2				
None	Percent Blockage		0						0				
None	Right turn flare (veh)												
2  499  403  403  406  411  429  403  403  403  406  411  411  411  411  411  411  411	Median type		None		ĺ	LWLTL.							
499 403 1522 1561 346 1561 499 403 403 1522 1561 346 1561 772 1561 772 1561	Median storage veh)					2							
499 403 1522 1561 346 1561 772 1562 1561 346 1561 772 1562 1561 346 1561 772 1562 1563 772 1563 772 1563 141 1562 1563 141 1562 1563 141 1562 1563 141 1562 1563 141 1562 1563 141 1562 1563 141 1562 1563 141 1562 1563 141 1562 1563 141 1562 1563 141 1562 1563 141 1562 1563 141 1562 1563 141 1562 1563 141 1563	Upstream signal (m)												
499 403 1522 1561 346 1561 499 403 403 1522 1561 346 1561 41 4.1 4.1 4.1 7.1 6.5 6.2 7.2 2.2 2.2 2.2 4.6 133 699 90 1065 1730 0 0 0 178 41 57 178 499 547 88 276 180 0 0 178 40 547 88 125 180 1065 1700 1135 1700 69 699 145 180 0 0 170 0 1135 1700 69 699 145 180 0 0 170 0 1135 1700 69 699 145 180 0 0 170 0 1135 1700 69 699 145 180 0 0 170 0 1135 1700 69 699 145 180 0 170 0 1135 1700 69 699 145 180 0 170 0 1135 1700 69 699 145 180 0 170 0 1135 1700 69 699 145 180 0 170 0 1135 1700 69 699 145 180 0 170 0 1135 1700 69 699 145 180 0 170 0 1135 1700 69 699 145 180 0 170 0 1135 1700 69 699 145 180 0 170 0 1135 1700 69 699 145 180 0 170 0 1135 1700 69 699 145 180 0 170 0 1135 1700 69 699 145 180 0 170 0 1135 1700 69 699 145 180 0 170 0 1135 1700 69 699 145 180 0 170 0 1135 1700 69 699 145 180 0 170 0 1135 1700 69 699 145 180 0 170 0 1135 1700 69 699 145 180 0 170 0 1135 1700 69 699 145 180 0 170 0 1135 1700 69 699 145 180 0 170 0 1135 1700 69 699 145 180 0 1700 0 1135 1700 69 699 145 180 0 1700 0 1135 1700 69 699 145 180 0 1700 0 1135 1700 69 699 145 180 0 1700 0 1135 1700 69 699 145 180 0 1700 0 1135 1700 69 699 145 180 0 1700 0 1135 1700 69 699 145 180 0 1700 0 1135 1700 69 699 145 180 0 1700 0 1135 1700 69 699 145 180 0 1700 0 1135 1700 69 699 145 180 0 1700 0 1135 1700 69 699 145 180 0 1700 0 1135 1700 69 699 145 180 0 1700 0 1700 0 1135 1700 69 699 145 180 0 1700 0 1135 1700 69 699 145 180 0 1700 0 1135 1700 69 699 145 180 0 1700 0 1135 1700 69 699 145 180 0 1700 0 1135 1700 69 699 145 180 0 1700 0 1700 0 1135 1700 69 699 145 180 0 1700 0 1135	pX, platoon unblocked												
100	vC, conflicting volume	499			403			1522	1561	346	1561	1535	418
499   403   1522   1561   346   1561   41   4.1   4.1   4.1   4.1   4.1   4.1   4.1   4.1   4.1   4.1   4.1   4.1   4.1   4.1   4.1   4.1   4.1   5.2   1561   346   1561   5.2	vC1, stage 1 conf vol							902	902		772	772	
499 403 1522 1561 346 1561 1 4.1 4.1 4.1 7.1 6.5 6.2 7.2 2.2 3.5 4.0 3.3 8.6 12.2 3.5 4.0 1005 1105 1135 6.9 10.0 87 0 1005 1135 6.9 10.0 87 0 1005 1130 6.9 10.0 87 0 1005 1130 6.9 10.0 1005 1130 6.9 10.0 1005 1130 6.9 10.0 1005 1130 6.9 10.0 1005 1130 1130 1130 1130 1130 1130 113	vC2, stage 2 conf vol							816	822		789	763	
4.1 4.1 4.1 7.1 6.5 6.2 7.2 2.2 2.2 2.2 6.9 133 6.9 1065 1135 84 0 100 87 0 108 341 57 178 499 547 88 276 108 1700 1700 1135 1700 69 699 145 0.17 0.20 0.03 0.16 0.29 7.88 0.13 1.89 0.17 0.20 0.03 0.16 0.29 7.88 0.13 1.89 0.17 0.20 0.23 8.8 0.0 Err 18 8 0.17 0.20 2.3 8614.8 775.2 0.18 2.3 8614.8 775.2 0.19 1 0.0 0.0 84 0.0 Err 18 1.89 0.10 1.35 1.30 8614.8 775.2 0.10 1.35 1.35 8614.8 775.2 0.10 1.35 1.35 8614.8 775.2 0.10 1.35 1.35 8614.8 775.2 0.10 1.35 1.35 8614.8 775.2 0.10 1.35 1.35 8614.8 775.2 0.10 1.35 1.35 8614.8 775.2 0.10 1.35 1.35 8614.8 775.2 0.10 1.35 1.35 8614.8 775.2 0.10 1.35 1.35 8614.8 775.2 0.10 1.35 1.35 8614.8 775.2 0.10 1.35 1.35 8614.8 775.2 0.10 1.35 1.35 8614.8 775.2 0.10 1.35 1.35 1.35 8614.8 775.2 0.10 1.35 1.35 1.35 1.35 1.35 1.35 1.35 1.35	vCu, unblocked vol	499			403			1522	1561	346	1561	1535	418
6.1 5.5 6.2  8.3 84 84 8.4  1065 1135 69 133 8.6  1180 341 57 178 499 547 88 125  106 1700 1700 1700 186 699 146  0.17 0.20 0.03 0.16 0.29 7.88 0.13 1.89  1.9 0.0 0.0 4.4 0.0 Err 3.4 188.9  9.1 0.0 0.0 8.8 0.0 Err 10.8 15.5  1.8 8 125  1.8 9 16  1.8 18 9 16  1.8 18 9 18  1.8 18 18  1.8 18 18  1.8 18 18  1.8 18 18  1.	tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.2	6.5	6.3
2.2 2.2 3.5 4.0 3.3 3.6 10.0 87 0 10	tC, 2 stage (s)							6.1	5.5		6.2	5.5	
83	tF(s)	2.2			2.2			3.5	4.0	3.3	3.6	4.0	3.4
1065 1135 69 133 699 90  EB 1 EB 2 EB 3 WB 1 WB 2 NB 1 NB 2 SB 1  180 341 57 178 499 547 88 276  180 0 0 178 0 547 0 151  1005 1700 1700 1135 1700 69 699 145  0.17 0.20 0.03 0.16 0.29 7.88 0.13 1.89  1. 0.0 0.0 8 8 0.0 Err 3.4 168.9  9. 1 0.0 0.0 8 8 0.0 Err 475.2  A A A B B A F B F B  1. 2.8 2.3 8614.8 475.2  EB 4 75.2  A A A B A B B A B B A B B B B B B B B	p0 queue free %	83			84			0	100	87	0	100	80
EB 1   EB 2   EB 3   WB 1   WB 2   NB 1   NB 2   SB 1     180   341   57   178   499   547   88   276     180   0   0   178   0   547   8   276     1065   1700   1700   1135   1700   69   699   146     0.17   0.20   0.03   0.16   0.29   7.88   0.13   1.89     4.9   0.0   0.0   4.4   0.0   Err   3.4   168.9     4.9   0.0   0.0   8.8   0.0   Err   10.9   475.2     A A A A F F F F F F F F F F F F F F F	cM capacity (veh/h)	1065			1135			69	133	669	6	156	619
180 341 57 178 499 547 88 276 180 0 0 178 0 647 0 151 180 0 0 57 0 166 0 88 125 1065 1700 1700 1135 1700 69 699 146 0.17 0.20 0.03 0.16 0.29 7.88 0.13 1.89 4.9 0.0 0.0 4.4 0.0 Err 3.4 168.9 9.1 0.0 0.0 8.8 0.0 Err 10.9 475.2 A A A A F F B F F 1 2.8 2.3 8614.8 475.2 G587.6 ICU Level of Service	Direction, Lane #	EB 1	EB 2	EB3	WB 1	WB 2	NB 1	NB 2	SB 1				
180 0 0 178 0 547 0 151 0 0 0 57 0 166 0 88 125 1065 1700 1700 1135 1700 69 699 146 0.17 0.20 0.03 0.16 0.29 7.88 0.13 1.89 4.9 0.0 0.0 4.4 0.0 Err 10.9 475.2 A A A A A A F F B F F L S87.6 Idization 650.% ICU Level of Service	Volume Total	180	341	22	178	499	547	88	276				
1065 1700 1700 1135 1700 69 699 146 0.17 0.20 0.03 0.16 0.29 7.88 0.13 1.89 0.1 0.0 0.0 8.8 0.0 Err 10.9 475.2  A A A F B F  A A A F B F  B F  Comparison 650.0% ICU Level of Service 15	Volume Left	180	0	0	178	0	547	0	151				
1065 1700 1700 1135 1700 69 699 146 0.17 0.20 0.03 0.16 0.29 7.88 0.13 1.89 4.9 0.0 0.0 4.4 0.0 Err 3.4 168.9 9.1 0.0 0.0 8.8 0.0 Err 10.9 475.2 A A B B B B F B F B A F B F B A F B F B A F B F B A F B B B F B A F B B B B B B B B B B B B B B B B B	Volume Right	0	0	22	0	166	0	88	125				
0.17 0.20 0.03 0.16 0.29 7.88 0.13 1.89 4.9 0.0 0.0 4.4 0.0 Err 10.3 476.2 9.1 0.0 0.0 8.8 0.0 Err 10.9 475.2 1 2.8 2.3 8614.8 475.2 1 2.8 2.3 8614.8 475.2 1 2.8 2.3 8614.8 7.5 E	SSH	1065	1700	1700	1135	1700	69	669	146				
49 0.0 0.0 44 0.0 Err 34 168.9 9.1 0.0 0.0 88 0.0 Err 10.9 475.2 A A A F F B F 2.8 2.3 8614.8 475.2 F F E F E F E F E F E F E F E F E F E F	Volume to Capacity	0.17	0.20	0.03	0.16	0.29	7.88	0.13	1.89				
9.1 0.0 0.0 8.8 0.0 Err 10.9 475.2 A F B F F h) 2.8 2.3 8614.8 475.2 / Z587.6 ICU Level of Service 55.0% ICU Level of Service 15.0%	Queue Length 95th (m)	4.9	0.0	0.0	4.4	0.0	ä	3.4	168.9				
h) 2.8 2.3 8614.8 475.2 (1) 2.8 2.3 8614.8 475.2 F F F F F F F F F F F F F F F F F F F	Control Delay (s/veh)	9.1	0.0	0.0	8.8	0.0	Ē	10.9	475.2				
h) 2.8 2.3 8614.8 475.2 F F F F F F F F F F F F F F F F F F F	Lane LOS	∢			∢		ш	В	щ				
/ 2587.6 Utilization 65.0% ICU Level of Service 15.0%	Approach Delay (s/veh)	2.8			2.3		8614.8		475.2				
/ 2587.6 Utilization 65.0% ICU Level of Service 15.0% 15.00 Utilization 65.0% ICU Level of Service 15.00 Utilization 15.	Approach LOS						ட		ட				
2687.6 Utilization 65.0% ICU Level of Service 15	Intersection Summary												
Utilization 65.0% ICU Level of Service 15	Average Delay			2587.6									
	Intersection Capacity Utilizat	tion		%0.59	೦	U Level o	f Service			ပ			
	Analysis Period (min)			15									

Proposed Residential Development 20 Cairns Crescent, Huntsville Trans-Plan

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<2033 Total> Weekday AM Peak Hour 08/18/2025 HCM Unsignalized Intersection Capacity Analysis 4: Caims Crescent & Caims Drive

Movement	EB	EB	WBT	WBR	SBL	SBR	
Lane Configurations		4	£,		ž		
Traffic Volume (veh/h)	94	4	.4	157	47	148	
Future Volume (Veh/h)	95	4	4	157	47	148	
Sign Control		Free	Free		Stop		
Grade		%0	%0		%0		
Peak Hour Factor	0.93	0.93	09.0	09.0	0.82	0.82	
Hourly flow rate (vph)	101	4	7	262	22	180	
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	269				344	138	
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	569				344	138	
tC, single (s)	4.2				6.4	6.2	
tC, 2 stage (s)							
tF (s)	2.3				3.5	3.3	
p0 queue free %	92				6	80	
cM capacity (veh/h)	1261				298	806	
Direction, Lane #	EB 1	WB 1	SB 1				
Volume Total	105	269	237				
Volume Left	101	0	22				
Volume Right	0	262	180				
SSH	1261	1700	807				
Volume to Capacity	0.08	0.16	0.29				
Queue Length 95th (m)	2.1	0.0	8.6				
Control Delay (s/veh)	7.8	0.0	11.3				
Lane LOS	∢		മ				
Approach Delay (s/veh)	7.8	0.0	11.3				
Approach LOS			Ω				
Information Cumman							
Minersection Summary			5.7				
Avelage Delay			07.407	2			*
Intersection Capacity Utilization	of to						•

Proposed Residential Development 20 Caims Crescent, Huntsville Trans-Plan

HCM Unsignalized Intersection Capacity Analysis 5: Access & Cairns Crescent

<2033 Total> Weekday AM Peak Hour 08/18/2025

•	NBR		31	31			0.92	34										4			4	6.2		3.3	97	1080														
<b>√</b>	WBT NBL		0 20		Free Stop		0.92 0.92	0 22						None				24			24	6.4		3.5	86	986														
\ <u>\</u>	EBR WBL		6 9	6 9			0.92 0.92	7 10										7			7	4.1		2.2	66	1614	WB 1 NB 1		10 22				0.1 1.4			7.2 8.7	A		9.7	
†	EBT	<b>2</b>	.0	0	Free	%0	0.92	0						None													EB 1	7	0	7	1700		0.0	0.0		0.0				
	Movement	Lane Configurations	Traffic Volume (veh/h)	Future Volume (Veh/h)	Sign Control	Grade	Peak Hour Factor	Hourly flow rate (vph)	Pedestrians	Lane Width (m)	Walking Speed (m/s)	Percent Blockage	Right turn flare (veh)	Median type	Median storage veh)	Upstream signal (m)	pX, platoon unblocked	vC, conflicting volume	vC1, stage 1 conf vol	vC2, stage 2 conf vol	vCu, unblocked vol	tC, single (s)	tC, 2 stage (s)	tF (s)	p0 queue free %	cM capacity (veh/h)	Direction, Lane #	Volume Total	Volume Left	Volume Right	SSH	Volume to Capacity	Queue Length 95th (m)	Control Delay (s/veh)	Lane LOS	Approach Delay (s/veh)	Approach LOS	Intersection Summary	Average Delay	

Proposed Residential Development 20 Cairns Crescent, Huntsville Trans-Plan

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HCM Unsignalized Intersection Capacity Analysis <2033 Total> Weekday AM Peak Hour 6: Kitchen Road South/Kithcen Road South & Main Street West/Main StreetWest 08/18/2025

	١	Ť	~	•	,	/		_	Ĺ	•	+	,
Movement	EB	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	<u>r</u>	2,		K	*			÷			2,	
Traffic Volume (veh/h)	· m	467	16	88	551	0	9	.0	79	0	0	2
Future Volume (Veh/h)	က	467	16	38	221	0	9	0	79	0	0	2
Sign Control		Free			Free			Stop			Stop	
Grade		%0			%0			%0			%0	
Peak Hour Factor	0.78	0.78	0.78	0.88	0.88	0.88	0.64	0.64	0.64	0.75	0.75	0.75
Hourly flow rate (vph)	4	299	21	43	979	0	တ	0	123	0	0	3
Pedestrians					_			-				
Lane Width (m)					3.6			3.6				
Walking Speed (m/s)					1.2			1.2				
Percent Blockage					0			0				
Right turn flare (veh)												
Median type		TWLTL			None							
Median storage veh)		7										
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	929			621			1334	1331	612	1443	1341	626
vC1, stage 1 conf vol							619	619		712	712	
vC2, stage 2 conf vol							715	712		731	629	
vCu, unblocked vol	929			621			1334	1331	612	1443	1341	626
tC, single (s)	4.1			4 1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	2.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			96			97	100	75	100	100	8
cM capacity (veh/h)	965			696			322	337	496	230	325	488
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	4	620	43	626	132	3						
Volume Left	4	0	43	0	6	0						
Volume Right	0	74	0	0	123	က						
SSH	965	1700	696	1700	479	488						
Volume to Capacity	0.00	0.36	0.04	0.37	0.28	0.01						
Queue Length 95th (m)	0.1	0.0	<del>-</del>	0.0	8.9	0.1						
Control Delay (s/veh)	8.7	0.0	8.9	0.0	15.4	12.4						
Lane LOS	∢		∢		ပ	В						
Approach Delay (s/veh)	0.1		9.0		15.4	12.4						
Approach LOS					ပ	മ						
Intersection Summary												
Average Delay			1.7									
Intersection Capacity Utilization	tion		49.0%	ᅙ	) Level o	ICU Level of Service			⋖			
Analysis Doriog (min)												

ntial Development 20 Cairns Crescent, Huntsville	
Proposed Residential Devel	Trans-Plan

HCM Unsignalized Intersection Capacity Analysis <2033 Total> Weekday AM Peak Hour 7: Kitchen Road South & Cairns Crescent

7: Kitchen Road South & Cairns Crescent	h & C	airns (	resce	Į.			08/18/2025
	4	>	•	•	-	•	
Movement	표	FRR	R	NRT	SRT	and S.	
Lane Configurations	Þ	i		4	<b>2</b>		
Traffic Volume (veh/h)	36	40	135	45	23	15	
Future Volume (Veh/h)	36	40	135	45	23	15	
Sign Control	Stop			Free	Free		
Grade	%0			%0	%0		
Peak Hour Factor	0.50	0.50	0.65	0.65	09.0	09.0	
Hourly flow rate (vph)	72	80	208	69	38	25	
Pedestrians	14			17	က		
Lane Width (m)	3.6			3.6	3.6		
Walking Speed (m/s)	1.2			1.2	1.2		
Percent Blockage	-			-	0		
Right turn flare (veh)							
Median type				None	None		
Median storage veh)							
Upstream signal (m)							
pX, platoon unblocked							
vC, conflicting volume	553	82	22				
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	223	87	11				
tC, single (s)	6.4	7.2	4 1				
tC, 2 stage (s)							
tF (s)	3.5	4.2	2.2				
p0 queue free %	83	8	98				
cM capacity (veh/h)	419	744	1517				
Direction, Lane #	EB 1	NB 1	SB 1				
Volume Total	152	277	63				
Volume Left	72	208	0				
Volume Right	8	0	52				
SSH.	244	1517	1700				
Volume to Capacity	0.28	0.14	0.04				
Queue Length 95th (m)	9.1	3.8	0.0				
Control Delay (s/veh)	14.2	6.1	0.0				
Lane LOS	n (	∢ ;	d				
Approach Delay (s/ven)	14.2	6.1	0.0				
Approach LOS	മ						
Intersection Summary							
Average Delay			7.8				
Intersection Capacity Utilization Analysis Period (min)			32.0%	<u> </u>	ICU Level of Service	Service	<b>V</b>
			:				

Proposed Residential Development 20 Cairns Crescent, Huntsville Synchro Trans-Plan

08/18/2025 <2033 Total> Weekday PM Peak Hour 1: Aspin Road/Aspdin Road & Highway 11 Southbound On/Off-Ramp HCM Unsignalized Intersection Capacity Analysis

<2033 Total> Weekday PM Peak Hour

HCM Unsignalized Intersection Capacity Analysis <2033 Total> Wee 2: Highway 11 Northbound On/Off-Ramp & Aspdin Road/Main Street West

08/18/2025

SBT

SBL

NBR

WBR

EBR

292

**5** 54

264 264

195

00

Traffic Volume (veh/h) Future Volume (Veh/h)

Sign Control

Lane Configurations

465 465 Free 0% 0.89 522

478 478 Free 0% 0.83 576

0.92

0.92

0.83

0.83

0.89

0.89

0.83

0.83 0

Peak Hour Factor Hourly flow rate (vph) Pedestrians Lane Width (m) Walking Speed (m/s) Percent Blockage

Stop 0% 0.83

Stop 0% 0.92

522 6.2

1098 6.5

7.1

576 6.2

1098

7.2

576 4.1

522

Median storage veh)
Upstream signal (m)
Dy plation unblocked
v.c., conflicting volume
v.C., stage 1 conf vol
v.C., stage 2 conf vol
v.C., stage 2 conf vol
v.C., stage (s)
f.C., stage (s)

522

1098

1450

9/9

1098

1098

929

522

None

None

Right turn flare (veh)

Median type

3.3 100 559

4.0 100 215

3.5 35

3.3 32 519

4.0

3.6 84 183

2.2 100 1007

2.2 100 1055

None  None  1025 276  WB 1 WB 2 SB 1  276 287 147 207  None  1025 276  1025 276  1025 276  1025 276  1026 0 147  0 0 147  0 1287 207  100 0.0 66.3  0.0 0.0 66.3  0.0 0.0 46.8  10.2  10.2  10.2  10.2  10.2  10.3  10.3  10.4  10.4  10.5	\$38 538 538
1025 276 1025 276 6.4 6.2 3.5 3.3 42 73 254 760 WB 2 SB 1 287 354 0 147 287 207 170 0.85 0.0 66.3 0.0 46.8 E 46.8 E 46.8 E 46.8	0.77 0.77 699
1025 276 1025 276 6.4 6.2 3.5 3.3 42 73 254 760 WB 2 SB 1 287 354 0 147 287 207 170 0.416 0.17 0.85 0.0 66.3 0.0 46.8 E 46.8 E 46.8 E 46.8	
1025 276 1026 276 6.4 6.2 3.5 3.3 42 73 284 760 WB 2 SB 1 287 354 0 147 287 207 1700 468 0.0 66.3 0.0 46.8 E 46.8 E 46.8	None
1025 276 6.4 6.2 8.5 3.3 42 73 254 760 WB 2 SB 1 287 354 0 147 287 207 1700 416 0.17 0.85 0.0 66.3 0.0 46.8 E 46.8 E 1CU Level of Service	
1025 276 6.4 6.2 3.5 3.3 4.2 73 284 760 287 384 0 147 287 354 0 147 287 287 0.0 66.3 0.0 66.3 0.0 66.3 0.0 46.8 E 46.8 E 46.8	
3.5 3.3 42 73 2.54 760 WB 2 SB 1 287 354 287 207 1700 416 0.17 0.85 0.0 66.3 0.0 46.8 E 46.8 E 46.8	
254 760 WB 2 SB 1 287 354 0 147 287 354 0 147 287 207 1700 416 0.17 0.85 0.0 66.3 0.0 46.8 E 46.8 E A6.8	
WB 2 SB 1 287 354 0 147 287 207 1700 416 0.17 0.85 0.0 66.3 0.0 46.8 E 46.8 E Ac.8	
287 354 20 147 287 207 1700 416 0.17 0.85 0.0 663 0.0 46.8 E 46.8 E AG.8 ICU Level of Service	EB2 V
287 207 1700 416 0.17 0.85 0.0 66.3 0.0 46.8 E 46.8 E CU Level of Service	0
0.17 0.85 0.0 66.3 0.0 46.8 E E 46.8 E ICU Level of Service	0 1700
0.0 46.8 E E 46.8 E E CU Level of Service	0.41
E 46.8 E ICU Level of Service	8.1 0.0
E ICU Level of Service	
ICU Level of Service	
	75

Synchro 12 Report Page 1 Proposed Residential Development 20 Cairns Crescent, Huntsville Trans-Plan

Crescent,	
Cairns (	
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Synchro 12 Report Page 2

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ICU Level of Service

8.0 51.2% 15

Average Delay Intersection Capacity Utilization Analysis Period (min)

381 29 352 455 0.84 65.5 65.5 42.0

297 0 297 1700 0.17 0.0

0 0 0.31 0.0

235 0 235 0.14 0.0

0.34

cSH Volume to Capacity Queue Length 95th (m) Control Delay (s/veh) Lane LOS

9/9

Volume Total Volume Left Volume Right

0.0

0.0

Approach Delay (s/veh) Approach LOS

<2033 Total> Weekday PM Peak Hour 08/18/2025 HCM Unsignalized Intersection Capacity Analysis 3: Caims Drive & Main Street West

Part		4	†	<u>/</u>	<b>&gt;</b>	ţ	4	•	<b>←</b>	•	٠	<b>→</b>	•
Configurations	Aovement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (veh/h) 119 498 153 49 459 114 153 500 100 100 100 100 100 100 100 100 100	ane Configurations	-	*	<b>k</b> _	r	<b>\$</b>		<u>,                                    </u>	43			4	
s Volume (Vehrh) 119 498 153 49 459 114 153 Ontrol One (Vehrh) 119 498 153 49 459 114 153 Ontrol One	raffic Volume (veh/h)	119	498	153	49	459	114	153	0	11	157	0	191
Control         Free         Free           Four Feator         0%         0%         0%           Four Feator         0.85         0.85         0.82         0.92         0.70           Hour Feator         0.85         0.85         0.85         0.92         0.70         0.70           Athalians         Athalians         140         586         180         53         499         124         219         179         170	uture Volume (Veh/h)	119	498	153	49	459	114	153	0	77	157	0	191
trians  Muth (m)  yes and black age (veh)  trians  Muth (m)  yes and LOS  yes a 0.95  0.85  0.85  0.85  0.85  0.85  0.85  0.85  0.85  0.85  0.85  0.85  0.85  0.85  0.85  0.85  0.85  0.85  0.92  0.92  0.92  0.92  0.92  0.92  0.92  0.92  0.92  0.92  0.92  0.92  0.92  0.92  0.92  0.93  0.93  0.93  0.93  0.93  0.93  0.93  0.93  0.94  0.95  0.95  0.92  0.93  0.94  0.94  0.94  0.94  0.94  0.94  0.94  0.94  0.94  0.94  0.94  0.95  0.95  0.94  0.94  0.94  0.94  0.95  0.94  0.94  0.94  0.94  0.94  0.94  0.95  0.94  0.94  0.94  0.94  0.94  0.95  0.94  0.94  0.94  0.94  0.94  0.95	ign Control		Free			Free			Stop			Stop	
Mode (wh)         140         586         0.85         0.85         0.92         0.92         0.70           Aflow rate (vph)         140         586         180         53         499         124         219           Avidth (m)         Av	rade		%0			%0			%0			%0	
Marker (whi)   140   586   180   53   499   124   219     Muth (mi)	eak Hour Factor	0.85	0.85	0.85	0.92	0.92	0.92	0.70	0.70	0.70	0.85	0.85	0.85
Width (mis)         Figure 1896           Width (mis)         None         TWLTL           nt Blockage         TWLTL         1696           turn flare (veh)         None         TWLTL           nstorage weh)         2         866           aem signal (m)         766         1696           aem signal (m)         766         1696           aem signal (m)         766         1696           aem signal (m)         4.1         7.1           aem signal (m)         4.1         7.66         866           stage 2 conf vol         4.1         4.1         1.696         1.696           stage 2 conf vol         4.1         4.1         1.696         1.696         1.696           stage 2 conf vol         4.1         4.1         4.1         1.696         1.696         1.696           pacity (veh/h)         968         186         94         0         1.61         1.0<	lourly flow rate (vph)	140	286	180	23	499	124	219	0	110	185	0	225
Width (m)         Width (m)           htt Blockage         It Blockage           turn flare (veh)         None         TWLTL           n kyge         766         1696           n kyge         1696         1696           nam signal (m)         776         1696           nam signal (m)         4.1         7.1           atoo unblocked vol         623         766         1696           stage 2 con'r vol         4.1         4.1         7.1           stage 2 con'r vol         4.1         4.1         7.1           stage 2 con'r vol         4.1         4.1         7.1           stage 1 con'r vol         4.1         4.1         7.1           stage 6 s)         2.2         2.2         86           stage 8 so 2 so 1 vol         96         94         0           pacity (veh/h)         968         86         94         0           pacity (veh/h)         968         86         94         0           te Left         0         140         0         53         623         19           te Left         0         140         0         140         0         10         10         10	edestrians												
rum flance (hile)  rum flance (helt)  rum flance (h	ane Width (m)												
the Blockage from flater (veh) Institute (veh)	Valking Speed (m/s)												
turn flare (veh)         None         TWLTL           n type         1 TWLTL           aem signal (m)         2           aem signal (m)         623         1666           atoon unblocked         1696         1696           hage 1 conf vol         4.1         4.1         1696           stage 2 conf vol         4.1         4.1         1696           stage 2 conf vol         4.1         4.1         1696           stage 2 conf vol         4.1         4.1         17.1           stage 1 conf vol         623         766         86           stage 2 conf vol         623         766         86           inplocked vol         623         766         86           packty (verhk)         968         94         0           packty (verhk)         968         180         85         6.1           packty (verhk)         968         180         85         6.1         10           inclal         140         0         124         0         110         110         110         110         110         110         110         110         110         110         110         110         110         110	ercent Blockage												
n type name name name name name name name nam	light turn flare (veh)												
n storage veh)  and signal (in)  attage 2 conf vol  inthocked vol  623  766  866  870  871  871  871  871  872  873  873  874  875  871  871  872  873  873  874  875  875  875  875  875  875  875	ledian type		None			LWLTL							
beam signal (m)  attacon unblocked  attage 1 conf vol  attage 2 conf vol  attage 2 conf vol  attage 2 conf vol  attage 3 conf vol  attage 4 conf vol  attage 5 conf vol  attage 5 conf vol  attage 6 conf vol  attage 6 conf vol  attage 7 conf vol  attage 7 conf vol  attage 7 conf vol  attage 7 conf vol  attage 8 conf vol  attage 8 conf vol  attage 9 conf vol  attage 9 conf vol  attage 1 conf vol  attage 2 conf vol  attage 3 con  attage 4 con  attage 2 con  attage 3 con  attage 2 con  attage 2 con  attage 2 con  attage 2 con  attage 3 con  attage 2 con	ledian storage veh)					7							
atoon unblocked  military dulume 623 766 1696 1696 14992 Conf vol military dulume 623 766 860 1696 1696 1696 1696 1696 1696 1696 16	pstream signal (m)												
rufficting volume 623 766 1696 866 866 866 866 866 866 866 866 866	X, platoon unblocked												
stage 1 conf vol         66         866           stage 2 conf vol         623         766         1896           nnboked vol         623         766         1896         1896           stage (s)         4.1         4.1         7.1         1896	3, conflicting volume	623			99/			1696	1595	286	1643	1713	261
ltage 2 conf vol         stage 2 conf vol         830           ninblocked vol (s)         4.1	C1, stage 1 conf vol							998	998		299	299	
rublocked vol 623 766 1696 171 1896 1896 (s) 4.1 4.1 4.1 7.1 1896 (s) 2.2 2.2 2.2 2.2 2.2 3.5 94 0.0	32, stage 2 conf vol							830	729		926	1046	
gge (s)         4.1         4.1         4.1         7.1           stage (s)         2.2         6.1         7.1           sue free %         86         94         0           pacity (veh/h)         968         856         94         0           pacity (veh/h)         968         BB         856         55           ion, Lane #         EB 1         EB 2         EB 3         WB 1         MB 2         NB 2         5           ion, Lane #         EB 1         EB 2         EB 3         WB 1         MB 2         NB 1         NB 2         5           ion, Lane #         EB 1         EB 2         EB 3         WB 1         MB 2         NB 1         NB 2         5           ion, Lane #         EB 1         EB 2         EB 3         WB 1         MB 2         NB 2         5           ion, Lane #         EB 1         BB 3         WB 1         MB 2         NB 3         10         10           e Fight         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10	Su, unblocked vol	623			992			1696	1595	286	1643	1713	561
stage (s)         2.2         3.5           aue free %         86         94         0           pacity (verlh)         968         856         94         0           pacity (verlh)         968         856         826         55         0           pacity (verlh)         968         180         856         180         856         170         86         170         85         170         17	;, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
aue free % 86 94 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	;, 2 stage (s)							6.1	5.5		6.1	2.2	
968 856 55 968 866 55 968 180 55 623 219 110 140 0 6 180 0 124 0 110 968 1700 1700 866 1700 55 514 40 0.0 0.0 15 0.0 Err 13.9 3.9 9.3 0.0 0.9 5.5 0.0 Err 13.9 3.3 A A A A A 0.7 114 0.7 1112ation 74.8% ICU Level of Service	(s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
968 856 856 856 55 868 868 868 868 868 86	) dueue free %	86			94			0	100	79	0	100	22
EB 1   EB 2   EB 3   WB 1   WB 2   NB 1   NB 2	// capacity (veh/h)	968			826			22	215	514	143	193	525
140 586 180 53 623 219 110 140 0 0 53 0 219 110 0 0 180 0 124 0 110 968 1700 1700 866 1700 55 514 4.0 0.0 0.0 1.6 0.0 Err 6.4 2 9.3 0.0 0.0 9.5 0.0 Err 13.9 3.1 1.4 A 0.1 0.14 0.15 0.16 0.15 B 1.4 A 0.1 0.16 0.16 0.10 Err 13.9 3.10 0.10 0.10 0.10 Err 13.9 3.10 0.10 0.10 Err 13.9 3.10 0.10 0.10 Err 13.9 3.10 0.10 Err 13.9 0	irection, Lane #	EB 1	EB 2	EB3	WB 1	WB 2	NB 1	NB 2	SB 1				
140 0 0 53 0 219 0 0 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	olume Total	140	286	180	53	623	219	110	410				
0 0 180 0 124 0 110 968 1700 1700 866 1700 55 514 0.14 0.34 0.11 0.06 0.37 3.95 0.21 9.3 0.0 0.0 9.5 0.0 Err 13.9 3. A A A A A A 0.7 6660.5 31 1.4 0.7 6660.5 31 Ilization 74.8% ICU Level of Service	olume Left	140	0	0	23	0	219	0	185				
968 1700 1700 856 1700 55 514 0.14 0.34 0.11 0.06 0.37 3.95 0.21 4.0 0.0 0.0 1.6 0.0 Err 6.4 9.3 0.0 0.0 9.5 0.0 Err 13.9 A A A A A C A A B B 1.4 0.7 6660.5 Ilization 74.8% IOU Level of Service	olume Right	0	0	180	0	124	0	110	225				
0.14 0.34 0.11 0.06 0.37 3.95 0.21 4.0 0.0 0.0 1.6 0.0 Err 6.4 9.3 0.0 0.0 9.5 0.0 Err 13.9 A A F F B 1.4 0.7 6660.5 F F IOU Level of Service	盂	896	1700	1700	826	1700	22	514	238				
4.0 0.0 0.0 1.6 0.0 Err 6.4 9.3 0.0 0.0 9.5 0.0 Err 13.9 A A F B A 6660.5 F 1.4 1011.5 1011.5 IOU Level of Service	olume to Capacity	0.14	0.34	0.11	90.0	0.37	3.95	0.21	1.72				
9.3 0.0 0.0 9.5 0.0 Err 13.9 A A F B A 6660.5 1.4 0.7 6660.5 F 1011.5 1011.5 ICU Level of Service	ueue Length 95th (m)	4.0	0.0	0.0	1.6	0.0	ä	6.4	217.0				
A A F B  1.4 0.7 6660.5 F  1011.5 IOU Level of Service	ontrol Delay (s/veh)	9.3	0.0	0.0	9.5	0.0	Ē	13.9	377.0				
1.4 0.7 6660.5 F F 1011.5 IOU Level of Service	ane LOS	∢			∢		ட	Ω	ш				
1011.5	pproach Delay (s/veh)	1.4			0.7		6660.5		377.0				
1011.5	pproach LOS						ш		ட				
1011.5 74.8%	Itersection Summary												
74.8%	verage Delay			1011.5									
	itersection Capacity Utilization			74.8%	೦	U Level o	f Service			△			
Analysis Period (min) 15	nalysis Period (min)			15									

Proposed Residential Development 20 Cairns Crescent, Huntsville Trans-Plan

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<2033 Total> Weekday PM Peak Hour 08/18/2025 HCM Unsignalized Intersection Capacity Analysis 4: Caims Crescent & Caims Drive

Movement							
	田田	EBT	WBT	WBR	SBL	SBR	
Lane Configurations		4	2,		×		
Traffic Volume (veh/h)	131	4	4	66	156	46	
Future Volume (Veh/h)	131	4	4	66	156	46	
Sign Control		Free	Free		Stop		
Grade		%0	%0		%0		
Peak Hour Factor	0.80	0.80	0.88	0.88	98.0	0.86	
Hourly flow rate (vph)	164	2	2	112	181	53	
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	117				394	61	
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	117				394	61	
tC, single (s)	4.1				6.4	6.2	
tC, 2 stage (s)							
tF (s)	2.2				3.5	3.3	
p0 queue free %	88				99	92	
cM capacity (veh/h)	1478				238	1010	
Direction, Lane #	EB 1	WB 1	SB 1				
Volume Total	169	117	234				
Volume Left	164	0	181				
Volume Right	0	112	23				
cSH	1478	1700	601				
Volume to Capacity	0.11	0.07	0.39				
Queue Length 95th (m)	3.0	0.0	14.7				
Control Delay (s/veh)	7.5	0.0	14.7				
Lane LOS	∢		В				
Approach Delay (s/veh)	7.5	0.0	14.7				
Approach LOS			Ф				
Intersection Summary							
Average Delay			9.1				
Intersection Capacity Utilization	ation		32.3%	<u> </u>	J Level o	ICU Level of Service	∢
Analysis Period (min)			1,				

Proposed Residential Development 20 Caims Crescent, Huntsville Trans-Plan

HCM Unsignalized Intersection Capacity Analy 5: Access & Cairns Crescent

ak Hour DM D ۴

ıy PM Peak	08/18
<2033 Total> Weekday PM Peak	
<2033 To	
alysis	

/2025

	†	<i>&gt;</i>	<b>&gt;</b>	ţ	•	•	
Movement	EBT	EBR	WBL	WBT	NBL	NBR	
Lane Configurations	£,			4	Þ		
Traffic Volume (veh/h)	0	17	52	0	Ξ	16	
Future Volume (Veh/h)	0	17	52	0	#	16	
Sign Control	Free			Free	Stop		
Grade	%0			%0	%0		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	0	18	27	0	12	17	
Pedestrians							
Lane Width (m)							
Walking Speed (m/s)							
Percent Blockage							
Right turn flare (veh)							
Median type	None			None			
Median storage veh)							
Upstream signal (m)							
pX, platoon unblocked							
vC, conflicting volume			18		63	<b>о</b>	
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol			9		63	o	
tC, single (s)			4		6.4	6.2	
tC, 2 stage (s)							
tF(s)			2.2		3.5	3.3	
p0 queue free %			86		66	86	
cM capacity (veh/h)			1599		927	1073	
Direction, Lane #	EB 1	WB 1	NB 1				
Volume Total	18	27	59				
Volume Left	0	27	12				
Volume Right	18	0	17				
cSH	1700	1599	1007				
Volume to Capacity	0.01	0.02	0.03				
Queue Length 95th (m)	0.0	9.0	0.7				
Control Delay (s/veh)	0.0	7.3	8.7				
Lane LOS		∢	⋖				
Approach Delay (s/veh)	0.0	7.3	8.7				
Approach LOS			⋖				
Intersection Summary							
Average Delay			6.1				
Intersection Capacity Utilization	_		18.1%	⊇	ICU Level of Service	Service	A
Analysis Period (min)			15				

Proposed Residential Development 20 Cairns Crescent, Huntsville Trans-Plan

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<2033 Total> Weekday PM Peak Hour 6. Kitchen Road South/Kithcen Road South & Main Street West/Main StreetWest 08/18/2025 864 813 813 1677 6.5 5.5 4.0 98 218 Stop 0% 0.38 1862 864 998 7.1 7.1 6.1 3.5 29 0 SBL NBR 97 0.50 790 790 3 Stop 0% 0.50 6 3.6 0 1672 808 864 1672 6.5 5.5 4.0 98 0.50 675 808 867 675 7.1 6.1 6.1 3.5 93 231 图 0.93 **WBR** 588 588 Free 0% 0.93 632 None HCM Unsignalized Intersection Capacity Analysis 0.93 795 4.1 / 8 8 0.88 EBR TWLTL 2 689 689 689 Free 0% 0.88 0.88 6 632 632 Madian storage veh)
Upstream signal (m)
Dy patron unblocked
VC, conflicting volume
VC, stage 1 conf vol
VCL, stage 2 conf vol
VCL, stage 8 (s)
TC, stage (s)
TC, stage (s)
DQ queue free %
CM capacity (veh/h) Peak Hour Factor Hourly flow rate (vph) Pedestrians Lane Width (m)
Walking Speed (m/s)
Percent Blockage Traffic Volume (veh/h) Future Volume (Veh/h) Right turn flare (veh) Lane Configurations Median type Sign Control

0.38

632

632 6.2 3.3 484

3.3 51

2.2 86 834

2.2 99 960

632

Volume Total Volume Left Volume Right

ntial Development 20 Cairns Crescent, Huntsville	
Proposed Residential Develop	Trans-Plan

ပ

ICU Level of Service

4.2 66.1% 15

Average Delay Intersection Capacity Utilization Analysis Period (min)

218 0.02 0.02 0.6 21.9 C

216 16 194 368 0.59 28.7 27.8 D D

0.00 0.00 0.0

116 0 0 834 0.14 3.9 3.9 B 1.6

0.01 0.02 0.2 8.8 A A

cSH
Volume to Capacity
Queue Length 95th (m)
Control Delay (s/veh)
Lane LOS
Approach Delay (s/veh)
Approach LOS

0.0 0.0 0.0 0.0

<2033 Total> Weekdav PM Peak Hour HCM Unsignalized Intersection Capacity Analysis 7: Kitchen Road South & Cairns Crescent

Movement   EBL   EBR   NBL   NBT   SBT   SBR	HCM Unsignalized Intersection Capacity Analysis 7: Kitchen Road South & Cairns Crescent	ntersed uth & C	ction C airns (	apacity Cresce	/ Analy nt	sis,	<2033 10	<2033 Total> Weekday PM Peak Hour 08/18/2025
Marie   EBL   BBR   NBL   NBT   SBT   SBR		1	<i>&gt;</i>	•	<b>←</b>	<b>→</b>	<b>*</b>	
Configurations Yer 19 138 83 75 22 31  Volume (veh/h) 19 138 83 75 22 31  Volume (veh/h) 19 138 83 75 22 31  Volume (veh/h) 19 138 75 22 31  Sontol 0% 0% 0% 0% 0% 14  Hour Factor 0% 0.69 0.69 0.75 0.75  Hour Factor 0% 0.69 0.69 0.75 0.75  Hour Factor 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0%	Movement	EBL	EB	NBL	NBT	SBT	SBR	
Volume (veh/h)   19   138   83   75   22   31	Lane Configurations	>			÷	æ		
19   138   83   75   22   31     200	Traffic Volume (veh/h)	19	138	83	75	22	31	
Sipp   Free Free Free Free Free Free Free Fr	Future Volume (Veh/h)	19	138	83	75	22	31	
the Teactor 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0%	Sign Control	Stop			Free	Free		
Hour Factor 0.50 0.69 0.75 0.75  Hour tactor 0.50 0.60 0.69 0.75 0.75  Attians  Width (m) 3.6 1.2 1.2 1.2  Width (m) 3.6 3.6  Width (m) 3.6 3.6  Width (m) 3.6 3.6  Width (m) 3.6 3.6  It Blockage 0 0 0.00 0.00  It Blockage with 1.2 1.2  It Blockage with	Grade	%0			%0	%0		
Alians	Peak Hour Factor	0.50	0.50	69.0	0.69	0.75	0.75	
strians         2         1           with (m)         3.6         3.6           un flanckage         0         0           tr Blockage         0         0           tur flanc (veh)         None         None           ner signal (m)         None         None           aem signal (m)         A         C         72           stage 1 cord vol         A         C         72           stage 2 cord vol         A         C         A           stage (s)         3.5         3.3         2.2           stage (s)         3.5         3.3         2.2           packity (veh)h)         560         1020         15.38           pockity (veh)h)         560         1020         15.38           pockity (veh)h)         560         10.20         A           e Left         <	Hourly flow rate (vph)	88	276	120	109	59	41	
Width (m)         3.6         3.6           Width (m)         1.2         1.2           It Blockage         0         0           turn flare (veh)         0         0           In type         0         0           nonticting volume         402         52         72           nonticting volume         402         52         72           nonticked vol         402         52         72           nonticked vol         402         52         72           stage 1 conf vol         402         52         72           stage 2 conf vol         402         52         72           nonticked vol         402         52         72           stage 1 conf vol         402         52         72           stage 2 conf vol         402         52         72           stage 8         73         92         8           pacity (veh/h)         560         1020         1538           pacity (veh/h)         560         1020         1538           pacity (veh/h)         560         1020         170           ne Edit         23         103         0.0           ne Left	Pedestrians	2				-		
12 Annual Speed (im/s) 12 12 12 14 12 14 12 14 15 16 16 16 16 16 16 16 16 16 16 16 16 16	Lane Width (m)	3.6				3.6		
nt Blockage 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Walking Speed (m/s)	1.2				1.2		
In type in start even)  and signal (m)  am signal (	Percent Blockage	0				0		
in storage with a manifest and storage with a same signal (m) aem	Modian time (veri)				Ough	o o o		
ans signal (n) atoon unblocked atoon unblocked atoon unblocked vol atoon unblocked vol atoon or vol atoon atoon or vol atoon atoon or vol atoon a	Modian storage year)				20	200		
adono unblocked  and control of the	Instream signal (m)							
Attacher and stage 1 conf vol stage 1 conf vol stage 2 conf vol stage 2 conf vol stage 2 conf vol stage 2 conf vol stage 3 conf vol stage (s) 6.4 6.2 4.1 stage (s) 3.5 3.3 2.2 stage (s) 3.5 3.3 2.2 stage (s) 3.5 3.3 2.2 stage 5 conf vol stage (s) 6.4 6.2 4.1 stage (s) 7.3 5 0.2 ctage 6 conf vol stage (s) 7.3 5 0.2 ctage 6 ctage 7 ct	openicam signal ()							
stage 1 conf voil stage 2 conf voil stage 2 conf voil stage (s) 6.4 6.2 7.2 stage (s) 8.4 6.2 4.1 stage (s) 8.4 6.2 4.1 stage (s) 8.4 6.2 4.1 stage (s) 8.5 3.3 2.2 stage (s) 8.5 3.3 2.2 stage (s) 8.5 3.3 2.2 stage (s) 1702 1538 stage (s) 1702 1538 stage (s) 102 1538 stage (s) 102 1538 stage (s) 102 1538 stage (s) 102 1538 stage (s) 103 0.0 stage (s) 10	vC. conflicting volume	402	22	22				
stage (s)         6.4         6.2         4.1           inblocked vol         6.4         6.2         4.1           stage (s)         6.4         6.2         4.1           stage (s)         3.5         3.3         2.2           ene free %         93         73         92           perity (verlnf)         560         1538           poor, Lane #         EB 1         NB 1         SB 1           ion, Lane #         EB 1         NB 1         SB 1           ion, Lane #         EB 1         NB 1         SB 1           ion, Lane #         EB 1         NB 1         SB 1           ion, Lane #         EB 1         NB 1         SB 1           ion, Lane #         EB 1         NB 2         70           ion, Lane #         EB 1         NB 2         70           ion Lotal Si Si Ton Park #         A 2         0.0           ion Right         324         0.0         0.0           Los Right         A 2         0.0           Los Right         A 2         0.0           Los Acth Cols Si Si Si Si Norio         B A         A 2           act Doley (siveh)         B 3.4%         IOU Level of Service	vC1, stage 1 conf vol							
rublocked vol 402 52 72 stage (s) 6.4 6.2 4.1 stage (s) 3.5 3.3 2.2 eue free % 93 73 92 pacify (vehlh) 560 1020 1538 ion_Lane # EB1 NB1 SB1 en Total 314 229 70 en Total 314 229 70 en Eight 276 0 41 en Capacity 0.34 0.08 0.04 en to Capacity (sveh) 10.9 4.2 0.0 cach Delay (sveh) 10.9 4.2 0.0 debay (sveh) 10.9 4.2 0.0 declor Summary 7.1 ection Capacity Utilization 31.4% IOU Level of Service	vC2, stage 2 conf vol							
type (s)         6.4         6.2         4.1           siage (s)         3.5         3.3         2.2           eue free %         93         73         92           pacity (ve/h/h)         560         1020         1538           pacity (ve/h/h)         560         1020         1538           ion. Lane #         EB 1         NB 1         SB 1           ion. Lane #         EB 1         NB 1         SB 1           ion. Lane #         EB 1         NB 1         SB 1           ion. Lane #         EB 1         NB 1         AD 0           ion. Lane #         EB 1         NB 1         AD 0           ion. Lane #         EB 1         NB 1         AD 0           ion. Right         120         0.0         AD 0           ion. Lost         AD 0.0         AD 0.0         AD 0.0           catch Delay (siveh)         10.9         4.2         0.0           ach Delay (siveh)         B         A         Co.0           ach Delay         AD 0.0         AD 0.0         AD 0.0           ach Delay         AD 0.0         AD 0.0         AD 0.0           ach Delay         AD 0.0         AD 0.0         AD 0.0<	vCu, unblocked vol	402	25	72				
stage (s)  3.5 3.3 2.2 aue free % 93 73 92 pacify (vehh) 560 1020 1538 pacify (vehh) 560 1020 1020 1020 1020 1020 1020 1020 10	tC, single (s)	6.4	6.2	4.1				
3.5 3.3 2.2 pacity (vehln) 538 73 92 pacity (vehln) 6.00 1538 pacity (vehln) 7.8 pacity 7	tC, 2 stage (s)							
93 73 92 560 1020 1538 EB 1 NB 1 SB 1 38 120 0 276 0 41 928 1538 1700 0.34 0.08 0.04 n) 120 0.0 10.9 4.2 0.0 B A A ICU Level of Service	tF(s)	3.5	3.3	2.2				
560 1020 1538  EB 1 NB 1 SB 1 314 229 70 38 120 0 276 0 41 928 1538 1700 0.34 0.08 0.04 10.9 4.2 0.0 B A 110.9 4.2 0.0 B A 110.9 4.2 0.0 C B 110.9 4.2 0.0 C C C C C C C C C C C C C C C C C C C	p0 queue free %	83	73	95				
EB 1 NB 1 SB 1  314 229 70  318 120 0  276 0 41  928 1538 1700  0.34 0.08 0.04  m) 12.0 2.0 0.0  h) 10.9 4.2 0.0  B A  7.1  Utilization 31.4% ICU Level of Service	cM capacity (veh/h)	260	1020	1538				
314 229 70 38 120 0 276 0 41 928 1538 1700 0.34 0.08 0.04 112.0 2.0 0.0 10.9 4.2 0.0 B A In) 10.9 4.2 0.0 B A In) 10.9 4.2 0.0 B A In) 10.9 4.2 0.0 In) 10.9 4.2 0.0 In) 10.9 4.2 0.0 In) 10.9 4.2 0.0	Direction, Lane #	EB 1	NB 1	SB 1				
38 120 0 276 0 41 928 1700 0.34 0.08 0.04 112.0 2.0 0.0 10.9 4.2 0.0 B A A B A A A A A A A A A A A A A A A A	Volume Total	314	229	20				
276 0 41 928 1538 1700 0.34 0.004 m) 12.0 2.0 0.00 10.9 4.2 0.0 B A In) 10.9 4.2 0.0  V 7.1 Utilization 31.4% ICU Level of Service	Volume Left	88	120	0				
928 1538 1700 0.34 0.08 0.04 m) 12.0 0.0 10.9 4.2 0.0 B A 0.0 v 7.1 Utilization 31.4% ICU Level of Service	Volume Right	276	0	4				
m) 120 2.0 0.04  m) 120 2.0 0.0  m) 10.9 4.2 0.0  B A A 0.0  M A A 1.0  M A A 1.0  M	cSH	928	1538	1700				
n) 12.0 2.0 0.0 10.9 4.2 0.0 B A B sh) 10.9 4.2 0.0 B A C C C C C C C C C C C C C C C C C C	Volume to Capacity	0.34	0.08	0.04				
10.9 4.2 0.0 B A In) 10.9 4.2 0.0 B 7.1 Utilization 31.4% ICU Level of Service	Queue Length 95th (m)	12.0	2.0	0.0				
B         A           y (s/veh)         10.9         4.2         0.0           mmany         7.1         7.1           pacity Utilization         31.4%         IOU Level of Service           1 (min)         15	Control Delay (s/veh)	10.9	4.2	0.0				
y (s/veh) 10.9 4.2 0.0  mmany 7.1  pacity Utilization 31.4% ICU Level of Service 1 (min)	Lane LOS	Ω	∢					
B   7.1   Pacity Utilization   31.4%   ICU Level of Service   16   15   15   15   15   15   15   15	Approach Delay (s/veh)	10.9	4.2	0.0				
mmany 7.1 7.1 Pacity Utilization 31.4% ICU Level of Service 1 (min) 15	Approach LOS	В						
7.1 7.1 Pacity Utilization 31.4% ICU Level of Service 1 (min)	Intersection Summary							
31.4% ICU Level of Service	Average Delay			7.1				
	Intersection Capacity Utilizatic	nc		31.4%	<u>ठ</u>	J Level o	f Service	¥
	Analysis Period (min)			15				

Proposed Residential Development 20 Cairns Crescent, Huntsville Trans-Plan

HCM Unsignalized Intersection Capacity Analysis<2038 Background> Weekday AM Peak Hour 08/18/2025 1: Aspin Road/Aspdin Road & Highway 11 Southbound On/Off-Ramp

HCM Unsignalized Intersection Capacity Analysis<2038 Background> Weekday AM Peak Hour

2: Highway 11 Northbound On/Off-Ramp & Aspdin Road/Main Street West

08/18/2025

SBT

SBL

NBR

BE

WBR

EBR

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207

26 26

173

195

0 0

Future Volume (Veh/h) raffic Volume (veh/h)

Sign Control

Lane Configurations

0.92

0.92 0

0.81

0.81

0.93

0.00

0.88

0.88 0

Peak Hour Factor Hourly flow rate (vph) Pedestrians Lane Width (m) Walking Speed (m/s) Percent Blockage

0.0

Stop 0% 0.92

Stop 0% 0.81

332 332 Free 0% 0.93 357

366 366 Free 0% 0.88 416

																																								A	
•	SBR		163	163			69.0	236										215			215	6.2		3.3	71	821														f Service	
و م	WBR SBL		162 177		Stop			172 257	2	3.6	1.2	0						717			717	6.5		3.6	32	379	WB 2 SB 1	172 493			1700 510		0.0 100.4		L 6	60.3	ட			ICU Level of Service	
<b>↓</b>	EBT WBT		384 197		_		0.85 0.94							None None													EB 2 WB 1	2	0 0		1700 1700		0.0 0.0		d	0.0			22.1	46.7%	15
≺	EBL		21		ш			75						Ż				215			215	4.6		2.6	86	1124	EB 1 E	, 25	22		1124 1		0.5		₹ ?	4.0				ation	
	Movement	Lane Configurations	Traffic Volume (veh/h)	Future Volume (Veh/h)	Sign Control	Grade	Peak Hour Factor	Hourly flow rate (vph)	Pedestrians	Lane Width (m)	Walking Speed (m/s)	Percent Blockage	Right turn flare (veh)	Median type	Median storage veh)	Upstream signal (m)	pX, platoon unblocked	vC, conflicting volume	vC1, stage 1 conf vol	vC2, stage 2 conf vol	vCu, unblocked vol	tC, single (s)	tC, 2 stage (s)	tF(s)	p0 queue free %	cM capacity (veh/h)	Direction, Lane #	Volume Total	Volume Left	Volume Right	CSH.	Volume to Capacity	Queue Length 95th (m)	Control Delay (s/veh)	Lane LOS	Approach Delay (s/ven)	Approach LOS	Intersection Summary	Average Delay	Intersection Capacity Utilization	Analysis Period (min)

362

6.5

1034

416

6.5

773

416

362

362

778

1034

416

778

773

416

362

Median storage veh)
Upstream signal (m)
pX, platron unblocked
vC, conflicting volume
vC1, stage 1 conf vol
vC2, stage 2 conf vol
vC2, unblocked vol

None

None

Right turn flare (veh)

Median type

3.3 100 687

4.0 330

3.5 100 125

3.4 59 622

4.0 330

3.9 88 272

2.2 100 1154

2.2 100 1208

tC, single (s)
tC, 2 stage (s)
tF (s)
p0 queue free %
cM capacity (veh/h)

Direction, Lane # Volume Total Volume Left Volume Right

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Proposed Residential Development 20 Cairn Trans-Plan
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ICU Level of Service

3.7 40.2% 15

Intersection Capacity Utilization Analysis Period (min)

288 32 256 256 544 0.53 24.6 18.8 C

0.0 1700 0.11 0.0

0.0 0.21 0.0 0.0

222 0 222 0.13 0.13 0.00

0.24

cSH Volume to Capacity Queue Length 95th (m) Control Delay (s/veh) Lane LOS

0.0

0.0

Approach Delay (s/veh) Approach LOS

186

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HCM Unsignalized Intersection Capacity Analysis<2038 Background> Weekday AM Peak Hour 3: Cairns Drive & Main Street West

HCM Unsignalized Intersection Capacity Analysis<2038 Background> Weekday AM Peak Hour ناما المالية ا

SBR 163 163 0.82

0.60

Free 0% 0.60 7

Free 0% 0.93 4

0.93

Peak Hour Factor
Hourly flow rate (vph)
Pedestrians
Lane Width (m)
Walking Speed (m/s)
Percent Blockage
Right turn flare (veh)

SBL 42 42 Stop 0% 0.82 51

139

**5** 5

Traffic Volume (veh/h) Future Volume (Veh/h) Sign Control

Lane Configurations

Lane Configurations								
(m) 545 (m) 175 350 48 157 170 175 350 48 157 170 170 170 170 170 170 170 170 170 17	EBR WBL	'BT WBR	NBL	NBT	NBR	SBL	SBT	SBR
(m) 175 350 48 157  (n) 175 350 48 157  (n) 188 376 52 196  (n) 545  (n) 545  (n) 546  (m) 547  (m) 548  (m) 548  (m) 549  (m) 540  (m) 640  (m) 64	* * *		×	\$			4	
(m) 175 350 48 157  Free	350 48 157	324 156	183	0	26	147	0	122
Free (198    198	350 48 157		183	0	29	147	0	122
(m) 5.45 (106 (106 (106 (106 (106 (106 (106 (106		Free		Stop			Stop	
(m) 5.45 (196 (196 (196 (196 (196 (196 (196 (196				%0	000		%0	0
106   370   32   190     1.2   3.6     1.2   3.6     1.2   0.00     1.2   0.00     1.2   0.00     1.2   0.00     1.2   0.00     1.2   0.00     1.2   0.00     1.2   0.00     1.2   0.00     1.2   0.00     1.2   0.00     1.3   0.00     1.4   0.00     1.5   0.00     1.6   0.00     1.7   0.00     1.8   0.00	0.93 0.80	88 0.88	0.36	0.36	0.60	0.30	0.93	0.93
3.6  1.2  None  None  545  1.4  1.7  None  1.8  1.8  1.8  1.8  1.8  1.8  1.8  1.	961 7c		2002	o  د	SS SS	203	>	2
Sin 1.2	7			0				
12 None TW  None 545 433  ed 545 433  bd 545 433  ed 641 545 433  ed 741 4.1  1024 1106  1024 1700 1700 1106  1024 1700 1700 1106  1024 1700 1700 1106  103 54 0.0 0.0 5.1  eh) 5.4 0.0 0.0 5.1  A A A A  leh) 2.8 2.4	3.6			3.6				
None   TW	1.2			1.2				
None	0			0				
None								
1   1   1   1   1   1   1   1   1   1		린						
ed 545 433  la 545 433  la 545 433  2.2 2.2 2.2  82 433  4.1 4.1  4.1  2.2 2.2 2.2  82 1024  1024 1700 1700 1106 1  1024 1700 1700 1106 1  (m) 5.4 0.0 0.0 5.1  ) A A A A A A A A A A A A A A A A A A		2						
ed 545 433  Jal 545 433  Jal 545 433  Jal 545 433  Jan 545 433  Jan 547 431  Jan 547 431  Jan 548 76 52 196  Jan 700 52 0.03 0.18 (106  Jan 54 0.0 0.0 5.1  Jan 54 0.0 0.0 9.0  Jan 55 0.0 0.0 9.0  Jan 55 0.0 0.0 9.0  Jan 54 0.0 0.0 9.0 9.0  Jan 54 0.0								
Per 545 433 433								
545 433 4.1 4.1 4.1 4.1 4.1 4.1 2.2 2.2 82 82 1024 1106 1024 1700 1700 1186 1 1024 1700 1700 1186 1 10.14 0.22 0.03 0.18 0 10.24 1700 1700 1186 1 10.18 0.0 0.0 5.1 10.18 0.0 0.0 5.1 10.18 0.0 0.0 5.1 10.18 0.0 0.18 0.18 0.18 0.18 0.18 0.18	433		1650	1694	381	1699	1658	459
545 433 4.1 4.1 2.2 2.2 82 1024 1054 106 188 0 0 196 0 52 0 0 1024 1700 1700 1106 1 0.18 0.2 0.03 0.18 (1 0.18 0.2 0.2 0.3 (1) (1 0.18 0.2 0.3 (1) (1) (1) (1) (1) (1) (1) (1) (1) (1)			757	757		849	849	
545 433 4.1 4.1 2.2 2.2 82 82 1024 1106 188 76 52 196 0 62 0.0 1024 1700 1700 1106 1 10 5.4 0.0 0.0 5.1 (m) 5.4 0.0 0.0 5.1 (m) 5.4 0.0 0.0 9.0 (m) 2.8 2.4			893	937		820	808	
2.2 2.2 8.2 10.24 11.06 10.24 11.06	433		1650	1694	381	1699	1658	459
2.2 2.2 8.2 8.2 8.2 8.2 8.2 8.2 8.2 8.2	4.1		7.1	6.5	6.2	7.2	6.5	6.3
2.2 2.2 2.2 2.2 2.2 2.2 2.2 2.2 2.2 2.2			6.1	5.5		6.2	2.5	
1024 106 1024 106 108 108 106 108 108 0 0 196 0 0 52 0 0 1024 1700 1700 1106 1 10 5.4 0.0 0.0 5.1 10 9.3 0.0 0.0 9.0 10 2.8 2.4	2.2		3.5	4.0	3.3	3.6	4.0	3.4
(m) 5.4 0.0 0.0 9.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	82		0	100	82	0	100	78
flore, Lane #         EB 1         EB 2         EB 3         WB 1         VMB 1           ne Total         188         376         52         196           ne Left         188         0         0         196           ne Right         0         0         0         196           ne to Capacity         0.18         0.22         0.03         0.18           e Length 95th (m)         5.4         0.0         0.0         5.1           LOS         A         A         A         A           sach Delay (s/veh)         2.8         A         A           Acaton Los         2.8         2.4           acaton Los         2.8         2.4           acaton Summary         355.1         255.1	1106		46	94	899	44	121	287
ne Total 188 376 52 196 ne Left 188 0 0 196 ne Right 0 0 52 0 0 ne Right 10.4 1700 1700 1700 ne to Capacity 0.18 0.22 0.03 0.18 10.18 LOS A 0.0 0.0 5.1 LOS A A A A A Acach Delay (siveh) 2.8 A A A A A A A A A A A A A A A A A A A	EB 3 WB 1	B2 NB1	NB 2	SB 1				
ne Left 188 0 0 196 ne Right 0 0 52 0 ne Right 1024 1700 1700 1106 ne to Capacity 0.18 0.22 0.03 0.18 e Length 95th (m) 5.4 0.0 0.0 5.1 LOS A A 0.0 0.0 9.0 LOS A A A A A Acach Delay (s/veh) 2.8 2.4 acach LOS acach LO	376 52 196	545 508	86	294				
ne Right 0 0 52 0 0 1 1024 1700 1700 1706 1700 1706 1706 1706 1706	0 0 196	0 508	0	163				
1024 1700 1700 1106 ne to Capacity 0.18 0.22 0.03 0.18 ol Defay (siveh) 5.4 0.0 0.0 5.1 ol Defay (siveh) 8.3 0.0 0.0 9.0 LOS A acch Delay (siveh) 2.8 A acch CoS acch	0 52 0		86	131				
0.18 0.22 0.03 0.18 54 0.0 0.0 5.1 9.3 0.0 0.0 9.0 A A A A A A A A A A A A A A A A A A A	1700 1700 1106		899	75				
5.4 0.0 0.0 5.1 9.3 0.0 0.0 9.0 A A A A A A A A A A A A A A A A A A A	0.22 0.03 0.18	_	0.15	3.91				
9.3 0.0 0.0 9.0 A A A A A A A A A A A A A A A A A A A	0.0 0.0	0.0 Err	4.	ü				
A 2.8 3555.1	0.0 0.0		11.3	Ë				
2.8		ட	В	ட				
mmary		8383.8		ᇤ				
nmary		ட		ட				
Utilization 68.6%		ICU Level of Service			ပ			
Analysis Period (min)	15							

3.3 78 925

3.5 91 589

2.3 91 1293

123 6.2

351 6.4

239

Muclan storage veh)
Upstream storage veh)
Upstream signal (m)
Dx. plation unblocked
v.C. conflicting volume
v.C. stage 1 conf vol
v.C., stage 2 conf vol
v.C., single (s)
f.C. stage (s)
f.C. stage (s)
f.C. stage (s)
Oqueue free %
cM capacity (vehh)

123

321

239

None None

Median type

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ICU Level of Service

6.1 37.2% 15

Average Delay Intersection Capacity Utilization Analysis Period (min)

250 51 199 829 0.30 11.2 11.2 B

Volume Total
Volume Left
Volume Left
Sch
Cost Colume to Capacity
Control Delay (siveh)
Lane LOS
Approach Delay (siveh)
Approach LOS

0.0

239 0.14 0.00

HCM Unsignalized Intersection Capacity Analysis<2038 Background> Weekday AM Peak Hour 08/18/2025 5: Access & Cairns Crescent

HCM Unsignalized Intersection Capacity Analysis<2038 Background> Weekday AM Peak Hour 6: Kitchen Road South/Kithcen Road South & Main Street West/Main StreetWest 08/18/2025 0.75

0

0.64

0.64

0.88

0.88

0.78

0.78

Peak Hour Factor Hourly flow rate (vph) Pedestrians

Lane Width (m)
Walking Speed (m/s)
Percent Blockage

Right turn flare (veh)

Median type

3.6

3.6

None

TWLTL 2

681

989

Median storage veh)
Upstream signal (m)
pX, platron unblocked
vC, conflicting volume
vC1, stage 1 conf vol
vC2, stage 2 conf vol
vCu, unblocked vol

Stop 0% 0.75

Stop 0% 0.64

604 604 604 0% 0.88 686

513 513 Free 0% 0.78 658

38

17

Traffic Volume (veh/h) Future Volume (Veh/h)

Sign Control

Lane Configurations

SBL

NBR

層

**WBR** 

EBR

/

49

989

6.2 6.2 3.3 99 99

3.3 83 459

2.2 96 920

2.2 100 917

tC, single (s)
tC, 2 stage (s)
tF (s)
p0 queue free %
cM capacity (veh/h)

1443 689 1443 6.5 5.5 4.0 100 308

754 774 1498 7.1 7.1 6.1 3.5 100 247

671

1432 678 1432 6.5 5.5 4.0 100 318

435 678 757 7.1 7.1 6.1 3.5 96

4.1

4.1

	†	<i>&gt;</i>	<b>&gt;</b>	ļ	•	•	
Movement	EBT	EBR	WBL	WBT	NBL	NBR	
Lane Configurations	æ			÷	<b>&gt;</b>		
Traffic Volume (veh/h)	0	0	0	0	0	0	
Future Volume (Veh/h)	0	0	0	0	0	0	
Sign Control	Free			Free	Stop		
Grade	%0			%0	%0		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	0	0	0	0	0	0	
Pedestrians							
Lane Width (m)							
Walking Speed (m/s)							
Percent Blockage							
Right turn flare (veh)							
	None			None			
Median storage veh)							
Upstream signal (m)							
pX, platoon unblocked							
vC, conflicting volume			0		0	0	
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol			0		0	0	
tC, single (s)			4.1		6.4	6.2	
tC, 2 stage (s)							
tF(s)			2.2		3.5	3.3	
p0 queue free %			100		100	100	
cM capacity (veh/h)			1623		1023	1085	
Direction, Lane #	EB 1	WB 1	NB 1				
Volume Total	0	0	0				
Volume Left	0	0	0				
Volume Right	0	0	0				
CSH	1700	1700	1700				
Volume to Capacity	0.00	0.00	0.00				
Queue Length 95th (m)	0.0	0.0	0.0				
Control Delay (s/veh)	0.0	0.0	0.0				
Lane LOS			⋖				
Approach Delay (s/veh)	0.0	0.0	0.0				
Approach LOS			⋖				
Intersection Summary							
Average Delay			0.0				
Intersection Capacity Utilization			%0.0	<u></u>	ICU Level of Service	Service	
Analysis Period (min)			15				

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ICU Level of Service

1.2 48.4% 15

Average Delay Intersection Capacity Utilization Analysis Period (min)

3 451 0.01 13.0 B B

88 11 77 77 77 6.20 6.1 6.1 15.5 C

0.0 0.40 0.0 0.0

0.0 0.40 0.0 0.0

34 0 0 0.04 0.09 9.1 A A 0.4

0.00 0.00 0.1 8.9 A A O.1

cSH
Volume to Capacity
Queue Length 95th (m)
Control Delay (s/veh)
Lane LOS
Approach Delay (s/veh)
Approach LOS

989

Volume Total Volume Left Volume Right

HCM Unsignalized Intersection Capacity Analysis<2038 Background> Weekday AM Peak Hour 7: Kitchen Road South & Cairns Crescent

																																								⋖	
*	SBR		7	7			09'0	12																																f Service	
<b>→</b>	SBT	2	52	52	Free	%0	09.0	42	က	3.6	1.2	0		None																										ICU Level of Service	
<b>←</b>	NBT	4	45	45	Free	%0	0.65	69	11	3.6	1.2	-		None																										_	
•	NBL		136	136			0.65	509										89			89	4.1		2.2	98	1528	SB 1	54	0	12	1700	0.03	0.0	0.0		0.0			6.4	31.4%	15
<b>/</b>	EBR		40	40			0.50	80										79			79	7.2		4.2	88	746	NB 1	278	500	0	1528	0.14	3.8	6.1	∢	6.1					
4	EBL	ž	. 9	9	Stop	%0	0.50	12	4	3.6	1.2	-						225			225	6.4		3.5	6	420	EB 1	95	12	8	8/9	0.14	3.7	1.1	ш	1.1	മ			_	
	Novement	-ane Configurations	raffic Volume (veh/h)	-uture Volume (Veh/h)	Sign Control	Grade	Peak Hour Factor	Hourly flow rate (vph)	Pedestrians	ane Width (m)	Walking Speed (m/s)	Percent Blockage	Right turn flare (veh)	Median type	Median storage veh)	Jpstream signal (m)	oX, platoon unblocked	,C, conflicting volume	vC1, stage 1 conf vol	vC2, stage 2 conf vol	/Cu, unblocked vol	.C, single (s)	C, 2 stage (s)	IF (s)	p0 queue free %	cM capacity (veh/h)	Direction, Lane #	/olume Total	/olume Left	Volume Right	SH	/olume to Capacity	Queue Length 95th (m)	Control Delay (s/veh)	ane LOS	Approach Delay (s/veh)	Approach LOS	ntersection Summary	Average Delay	ntersection Capacity Utilization	Analysis Period (min)

Proposed Residential Development 20 Cairns Crescent, Huntsville Synchro 12 Report Trans-Plan Page 7

HCM Unsignalized Intersection Capacity Analysis<2038 Background> Weekday PM Peak Hour 08/18/2025 1: Aspin Road/Aspdin Road & Highway 11 Southbound On/Off-Ramp

HCM Unsignalized Intersection Capacity Analysis<2038 Background> Weekday PM Peak Hour

2: Highway 11 Northbound On/Off-Ramp & Aspdin Road/Main Street West

08/18/2025

SBT

SBL

NBR

BE

WBR

EBR

/

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309

26 26

283

497 497 60.89 558

499 499 0% 0.83 601

Future Volume (Veh/h) raffic Volume (veh/h)

Sign Control

Lane Configurations

0.92

0.92

0.83

0.83

0.89

0.89

0.83

0.83 0

Peak Hour Factor Hourly flow rate (vph) Pedestrians

Lane Width (m)
Walking Speed (m/s)
Percent Blockage

Right turn flare (veh)

Median type

Stop 0% 0.83

Stop 0% 0.92

3.3 100 533

4.0 100 197

3.5 100 25

3.3 26 502

4.0 100 197

3.6 81 166

2.2 100 986

2.2 100 1023

tC, single (s)
tC, 2 stage (s)
tF (s)
p0 queue free %
cM capacity (veh/h)

601

Volume Total Volume Left Volume Right

31 372 434 0.93 83.9 58.1

0.0 0.0 0.0 0.0

558 0 0 1700 0.33 0.0

0.0 0.0 0.0 0.0

1700 0.35 0.0

cSH Volume to Capacity Queue Length 95th (m) Control Delay (s/veh)

58.1

0.0

0.0

Approach Delay (s/veh) Approach LOS

558

1159

1531

601

1159

1159

601

228

Median storage veh)
Upstream signal (m)
pX, platron unblocked
vC, conflicting volume
vC1, stage 1 conf vol
vC2, stage 2 conf vol
vCu, unblocked vol

None

None

558 6.2

1159

7.1

601

1159

7.2

4.1

4.1

Synchro 12 Report Page 1 Proposed Residential Development 20 Cairns Crescent, Huntsville Trans-Plan

Residential Development 20 Cairns Crescent,	
Proposed Resic	Trans-Plan

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ICU Level of Service

10.9 53.5% 15

Intersection Capacity Utilization Analysis Period (min)

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HCM Unsignalized Intersection Capacity Analysis<2038 Background> Weekday PM Peak Hour 3: Cairns Drive & Main Street West

HCM Unsignalized Intersection Capacity Analysis<2038 Background> Weekday PM Peak Hour ن ۲۰۰۰ منیمه و مینیمه ( 8/18/2025

SBR

51

80 80

**4** 4

Lane Configurations Traffic Volume (veh/h) Future Volume (Veh/h) Sign Control

SBL 140 140 0% 0.86 0.86 163

0.86

0.88

60% 0.88 5

Free 0% 0.80 5

0.80

Peak Hour Factor
Hourly flow rate (vph)
Pedestrians
Lane Width (m)
Walking Speed (m/s)
Percent Blockage
Right turn flare (veh)

Movement	EBR WBL 137 54 137 54 137 54 161 59	WBT WBR 56 120 506 120 Free 0% 0.92 0.92 550 130 TWLTL	NBL 149 149 170 213 1833 931	Stop 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	NBR 85 85	SBL	ZBZ <del>←</del>	SBR
121 550 137 121 550 137 121 550 137 121 550 137 122 647 161 142 647 161 142 647 161 142 647 161 142 647 161 142 647 161 142 647 161 142 647 161 142 647 161 142 647 161 143 0.0 0.0 150 338 0.09 (0 150 338 0.09 (0 150 338 0.09 (0 170 338 0.	137 54 137 54 137 54 161 59		0.70 0.70 213 1833 931	Stop 0.70 0.70 0.70	85 85		4	
121 550 137  121 550 137  121 550 137  142 647 161  None  680  4.1  2.2  86  922  86  922  142 647 161  142 647 161  142 647 161  142 647 161  142 647 161  143 00 00  15 0.38 0.09 (0  16 0.38 0.09 (0  17 0.43 0.0 0.0  18 0.0 0.0  19 0.0 0.0  10 0.0  11 0.0 0.0  12 0.0 0.0  13 0.0 0.0  14 0.0 0.0  15 0.0 0.0  16 0.0 0.0  17 0.0 0.0  18 0.0 0.0  18 0.0 0.0  18 0.0 0.0  19 0.0 0.0  10 0.0 0.0 0.0  10 0.0 0.0 0.0  10 0.0 0.0 0.0  10 0.0 0.0 0.0 0.0  10 0.0 0.0 0.0 0.0  10 0.0 0.0 0.0 0.0 0.0  10 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	137 54 137 54 0.85 0.92 161 59		0.70 0.70 213 931	Stop 0 0 0.70 0.70	85		•	
121 550 137 Free 0.85 0.85 0.85 0.85 0.85 0.85 0.85 0.85	137 54 0.8 <b>5</b> 0.92 161 59		0.70 213 1833 931	Stop 0% 0% 0.70	88	166	.0	199
Free 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0%	0.85 161 59		0.70 213 1833 931	Stop 0.70 0		166	0	199
0.85 0.85 0.85 0.85 0.85 0.85 0.85 0.85	0.85 0.92		0.70 213 1833 931	0.70			Stop	
0.85 0.85 0.85 0.85 0.85 0.85 0.85 0.85	0.85 0.92 161 59		0.70 213 11833 931	0.70			%0	
None  None  680  4.1  2.2 85 922 85 922 142 67 142 0 0 0 0 0 0 142 0 0 0 0 0 0 143 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	161 59		213 1833 931	0	0.70	0.85	0.85	0.85
Mone 680 680 4.1 4.1 647 161 142 647 161 10 0 0 10 0 0 0 0 0 0 0 0 0 0 0 0 0	C	WLTL 2	1833 931		121	195	0	234
Mone  880  4.1  2.2  85  922  85  922  86  922  700  142  647  161  142  647  161  142  0  0  143  0  0  15  170  170  170  170  170  170	cc	WLTL 2	1833 931					
None  680  4.1  2.2  85  922  85  922  142  647  161  142  0  0  0  15  0  15  0  17  143  0  0  16  0  17  17  17  17  17  17  17  17  17	cc	WLTL 2	1833					
Ad 680 680 4.1 680 680 680 680 680 680 680 680 680 680	cc	WLTL 2	1833					
B 680 680 4.1 2.2 85 922 85 922 142 647 142 67 142 67 142 142 142 142 142 142 142 142		WLTL 2	1833					
Mone  680 680 4.1 4.1 2.2 85 922 85 922 87 142 647 161 142 0 0 16 922 1700 1700 0 15 926 0.0 0 0 14 928 1700 1700 0 15 938 0.09 0 17 14 14	c	WLTL 2	1833					
680 680 4.1 2.2 86 922 922 142 647 161 142 0 0 0 0 1700 1700 1700 1700 1700 1700 1	c c	2	1833					
680 680 4.1 2.2 85 922 85 922 142 0 0 0 161 922 1700 1701 0 0.15 0.38 0.09 (0 0 15 0.38 0.09 (0 0 15 0.38 0.09 (0 0 15 0.38 0.09 (0 0 1 1.4			1833					
680 680 4.1 2.2 85 922 142 647 142 647 161 161 162 163 163 164 164 170 164 164 170 170 170 170 170 170 170 170			1833					
680 680 4.1 4.1 4.1 2.2 85 922 85 922 142 647 161 142 0 0 0 0 16 0 17 0 0 18 0 0 0 0 0 0 0 0 0 0 0 0 0	000		1833 931					
680 4.1 2.2 86 922 142 647 161 142 0 0 0 0 0 1700 1700 1700 0.15 0.38 0.09 ( 0.15 0.38 0.09 ( 0.15 0.38 0.09 ( 0.15 1.38 0.09 ( 0.15 1.38 0.09 ( 0.15 1.38 0.09 ( 0.15 1.38 0.09 ( 0.16 1.38 0.09 ( 0.17 0.18 0.09 ( 0.18 0.18 0.09 ( 0.18 0.18 0.09 ( 0.19 0.18 0.09 ( 0.19 0.18 0.09 ( 0.19 0.18 0.09 ( 0.11	808		931	1729	647	1785	1825	615
680 4.1 2.2 85 922 85 922 142 647 161 142 0 0 0 0 161 922 1700 1700 0.15 0.38 0.09 (0 0.15 0.38 0.09 (0 0.15 0.38 0.09 (0 0.17 0.00 (0 0.18 0.00 (0 0.19 0.00 (0 0.10 0				931		733	733	
680 4.1 2.2 86 922 142 647 161 142 647 161 142 0 0 0 0 0 161 922 1700 1700 0.15 0.38 0.09 C m) 4.3 0.0 0.0 A A O O.0			902	798		1052	1092	
2.2 85 922 87 142 647 161 142 647 161 142 0 0 0 0 0 0.15 0.38 0.09 C m) 4.3 0.0 0.0 A A 0.0 0.0	808		1833	1729	647	1785	1825	615
2.2 85 922 142 647 161 142 0 0 0 142 0 0 0 15 0.38 0.09 0 0 16 0.00 0.00 0.00 0.00 0.00 0.00 0.00	4.1		7.1	6.5	6.2	7.1	6.5	6.2
22 85 922 142 EB 1 EB 2 EB 3 W 142 0 0 0 161 922 1700 1700 0.15 0.38 0.09 0.0 0.15 0.38 0.09 0.0 0.15 0.38 0.09 0.0 0.17 0.38 0.09 0.0 0.18 0.09 0.00 0.0			6.1	5.5		6.1	5.5	
85 922 142 647 161 142 647 161 142 0 0 0 0 0 161 922 1700 1700 0.15 0.38 0.09 C m) 4.3 0.0 0.0 A A O O O	2.2		3.5	4.0	3.3	3.5	4.0	3.3
922 EB 1 EB 2 EB 3 W 142 647 161 142 0 0 0 0 0 922 7700 1700 0.15 0.38 0.09 C m) 4.3 0.0 0.0 A A 0.01	83		0	100	75	0	100	25
EB 1 EB 2 EB 3 W 142 647 161 142 0 0 0 0 0 922 7700 1700 0.15 0.38 0.09 C m) 4.3 0.0 0.0 A A 0.0 0.0	826		26	189	475	110	173	489
142 647 161 142 0 0 0 0 0 922 1700 1700 0 0.15 0.38 0.09 C m) 4.3 0.0 0.0 A A 0.0 0.0		WB 2 NB 1	NB 2	SB 1				
142 0 0 0 10 10 10 10 10 10 10 10 10 10 10	161		121	429				
0 0 161 922 1700 1700 0.15 0.38 0.09 (0 m) 4.3 0.0 0.0 9.6 0.0 0.0 A A O	0	0 213	0	195				
922 1700 1700 m) 0.15 0.38 0.09 (C) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	161		121	234				
m) 0.15 0.38 0.09 C m) 4.3 0.0 0.0 9.6 0.0 0.0 h) 1.4	1700		475	190				
m) 4.3 0.0 0.0 - 9.6 0.0 0.0 - A O.0 0.0 - 1.4	0.09	∞	0.25	2.26				
9.6 0.0 0.0 A A 1.4	0.0	0.0 Err	8.0	276.2				
A sh) 1.4	0.0	0.0 Err	15.2	621.5				
1.4	∢	ட	ပ	ட				
Approach LOS	8:0	6382.1		621.5				
		LL.		ட				
Intersection Summary								
Average Delay 978.9	978.9							
Utilization		ICU Level of Service			□			
Analysis Period (min)	15							

3.3 94 1017

3.5 68 513

2.2 88 1491

56 6.2

421 6.4

106

Muclan storage veh)
Upstream storage veh)
Upstream signal (m)
Dx. plation unblocked
v.C. conflicting volume
v.C. stage 1 conf vol
v.C., stage 2 conf vol
v.C., single (s)
f.C. stage (s)
f.C. stage (s)
f.C. stage (s)
Oqueue free %
cM capacity (vehh)

29

421

106

None None

Median type

Synchro 12 Report Page 3 Proposed Residential Development 20 Caims Crescent, Huntsville Trans-Plan

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Huntsville	
Crescent,	
0 Cairns	
roposed Residential Development 20 Cairns Crescent, Huntsv	
Residential	_
roposed	rans-Plan

ICU Level of Service

9.1 32.4% 15

Average Delay Intersection Capacity Utilization Analysis Period (min)

222 163 59 0.38 13.9 14.7 B

0.0

0.06

185 180 0 1491 0.12 3.3 7.6 A

Volume Total
Volume Left
Volume Left
Sch
Cost Colume to Capacity
Control Delay (siveh)
Lane LOS
Approach Delay (siveh)
Approach LOS

HCM Unsignalized Intersection Capacity Analysis<2038 Background> Weekday PM Peak Hour 08/18/2025 5: Access & Cairns Crescent

HCM Unsignalized Intersection Capacity Analysis<2038 Background> Weekday PM Peak Hour 6: Kitchen Road South/Kithcen Road South & Main Street West/Main StreetWest 08/18/2025 0.38

0

0.38

0.50

0.50

0.93

0.93

0.88

0.88 6

Peak Hour Factor Hourly flow rate (vph) Pedestrians Lane Width (m) Walking Speed (m/s) Percent Blockage

6 3.6 0

None

TWLTL 2

Right turn flare (veh)

Median type

Stop 0% 0.38

Stop 0% 0.50

644 644 Free 0% 0.93 692

753 753 753 Free 0% 0.88

8 8

9 9

Traffic Volume (veh/h) Future Volume (Veh/h)

Sign Control

Lane Configurations

SBL

NBR

層

WBR

EBR

83 83

Movement   EBT EBR WBL WBT NBL NBR   NBR   NBR   NBR   NBL NBR   NBL NBR   NBL NBR   NBL NBL NBR   NBL NBR		†	<i>&gt;</i>	<b>&gt;</b>	ļ	•	•	
origurations (vehich) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Movement	EBT	EBR	WBL	WBT	NBL	NBR	
Volume (verlyn)         0         0         0         0           Volume (verlyn)         0         0         0         0           Volume (verlyn)         0         0         0         0           Ow reactor         0.92         0.92         0.92         0.92         0.92           Ow reactor         0.92         0.92         0.92         0.92         0.92         0.92           Ow reactor         0         0         0         0         0         0         0           isians         Interest (verlyn)         None         None <td>-ane Configurations</td> <td>2,</td> <td></td> <td></td> <td>¢</td> <td>Þ</td> <td></td> <td></td>	-ane Configurations	2,			¢	Þ		
Volume (Veh/h)         0	raffic Volume (veh/h)	.0	0	0	0	0	0	
our Factor         Free         Stop           our Factor         0.92         0.92         0.92         0.92           flow rate (vph)         0         0         0         0           final (vith)         0         0         0         0           final (vith)         0         0         0         0           find (m)         3 Spead (ms)         8         8         9           find (m)         None         None         8         8         8           storage verbl         None         0 <td>uture Volume (Veh/h)</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td></td>	uture Volume (Veh/h)	0	0	0	0	0	0	
our Factor         0%         0%         0%           flow rate (vph)         0<	Sign Control	Free			Free	Stop		
1) 0.92 0.92 0.92 0.92 0.92 () 1) 0 0 0 0 0 0 1) None None None 10 0 0 0 10 100 100 100 100 100 100 100	Grade	%0			%0	%0		
1) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
None   None   None	Hourly flow rate (vph)	0	0	0	0	0	0	
Mone None None  10 0 0 0  11 0 0 0 0  12 2 3.5 3.3  100 100 100  1623 1085  EB 1 WB 1 NB 1  0 0 0 0  0 0 0 0  17700 1700 1700  0 0 0  0 0 0  17700 0.00 0.00  0 0 0  17700 0.00 0.00  1780 0.00 0.00  1790 0.00 0.00  1700 0.0	Pedestrians							
None   None   None	-ane Width (m)							
None None None    None   None	ing Speed (m/s)							
None   None   None	ent Blockage							
None None  N	t turn flare (veh)							
ed 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		None			None			
ed 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0	de veh)							
ed 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	ream signal (m)							
Per 10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	olatoon unblocked							
Handle of Service 1919  101  102  103  103  104  105  105  105  105  105  105  105	onflicting volume			0		0	0	
H 6.4 6.2  4.1 6.4 6.2  2.2 3.5 3.3  100 100  100 100  100 0 0  1700 1700 1	stage 1 conf vol							
(m) 0.00 0.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	stage 2 conf vol							
Holization 10.00 0.00 0.00 0.00 0.00 0.00 0.00 0.	unblocked vol			0		0	0	
2.2 3.5 3.3 100 100 100 1623 1085 1023 1085 0 0 0 0 0 0 1700 1700 1700 0.00 0.00 0.00 0.00 0.00 0.00 10 0.00 0.0	ingle (s)			4.1		6.4	6.2	
2.2 3.5 3.3 100 100 1623 1085 EB1 WB1 NB1 0 0 0 0 0 0 1700 1700 1700 0.00 0.00 0) 0 0.0 0) 0 0.0 0) 0 0.0 1) 0.0 0.0 1) 0.0 0.0 A A eh) 0.0 0.0 A A eh) 0.0 0.0 1) A A 100 0.0 100 0.0	stage (s)							
HO 100 100 100 105 1623 1085 1623 1085 1085 1085 1085 1085 1085 1085 1085	F (s)			2.2		3.5	3.3	
1623 1085  EB 1 WB 1 NB 1  0 0 0  0 0 0  1700 1700 1700  0 0.00  0 0.00  0 0.00  0 0.00  1 0.0	mene free %			100		100	100	
EB 1 WB 1 NB 1  0 0 0  0 0 0  1700 1700 1700 0.00  m) 0.00 0.00 0.00  h) 0.0 0.0 0.0  A A  h) 0.0 0.0 0.0  A A  to 0.0 0.0 0.0 0.0 0.0  A A  to 0.0 0.0 0.0 0.0 0.0  A A  to 0.0 0.0 0.0 0.0 0.0 0.0  A A  to 0.0 0.0 0.0 0.0 0.0 0.0 0.0  A A  to 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	apacity (veh/h)			1623		1023	1085	
0 0 0 0 0 0 1700 1700 1700 0.00 0.00 0.00 0.0 0.0 0.0 0.0 0.0 0.0 A h) 0.0 0.0 0.0 A A 10 0.0 0.0 A 10 0.0 0.0 A 11 0.0 0.0 A 12 0.0 13 0.0 14 0.0 15 0.0 16 0.0 17 0.0 18 0.0	tion, Lane #	EB 1	WB 1	NB 1				
(1700 1700 1700 1700 1700 1700 1700 1700	ne Total	0	0	0				
1700 1700 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Volume Left	0	0	0				
1700 1700 1700 n) 0.00 0.00 0.0 0.0 0.0 h) 0.0 0.0 0.0 A () A () 0.0 0.0 A () 0.0 ()	/olume Right	0	0	0				
n) 0.00 0.00 0.00 0.0 0.0 0.0 h) 0.0 0.0 0.0 A h) 0.0 0.0 0.0 A (A) 0.0 0.0 A (A) 0.0 0.0 A (A) 1.0 0.0 0.0 A 1.0 0.0 0.0 A 1.0 0.0 0.0 0.0	SSH	1700	1700	1700				
n) 0.0 0.0 0.0 0.0 0.0 A h) 0.0 0.0 0.0 A A  V  0.0 0.0 Utilization 0.0% ICU Level of Service 15	/olume to Capacity	0.00	0.00	0.00				
0.0 0.0 0.0 A A A   Utilization 0.0% ICU Level of Service 15	Queue Length 95th (m)	0.0	0.0	0.0				
h) 0.0 0.0 0.0 A A (1) 0.0 0.0 (1) 0.0 (1) 15evice 15e	rol Delay (s/veh)	0.0	0.0	0.0				
0.0 0.0 A A 0.0 0.0 Ilization 0.0% ICU Level of Service 15	SOT			∢				
A 0.0 CU Level of Service 15	oach Delay (s/veh)	0.0	0.0	0.0				
0.0 Utilization 0.0% ICU Level of Service 15	oach LOS			∀				
0.0 Utilization 0.0% ICU Level of Service 15	section Summary							
Utilization 0.0% ICU Level of Service 15	age Delay			0.0				
15	section Capacity Utilization	Ļ		%0.0	<u></u>	J Level of	Service	A
	vsis Period (min)			15				

6.2 6.2 3.3 100 447

3.3

2.2 89 783

2.2 99 912

tC, single (s)
tC, 2 stage (s)
tF (s)
p0 queue free %
cM capacity (veh/h)

887 887 1759 6.5 5.5 4.0 98

1915 872 1043 1915 7.1 6.1 3.5 100 54

864

882 872 1754 6.5 6.5 5.5 4.0 98

882 882 875 1756 7.1 6.1 3.5 93

4.1

4.1

864

869

692

Median storage veh)
Upstream signal (m)
pX, platroon unblocked
vC, conflicting volume
vC1, stage 1 conf vol
vC2, stage 2 conf vol
vCu, unblocked vol

Synchro 12 Report Page 5 Proposed Residential Development 20 Cairns Crescent, Huntsville Trans-Plan

12 Report	Page 6
Synchro 1	

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ICU Level of Service

3.5 67.3% 15

Intersection Capacity Utilization Analysis Period (min)

216 0.02 0.02 0.6 22.1 C

188 166 335 0.56 0.56 26.1 28.7 28.7

90 0 0 783 0.11 3.1 10.2 B

0 912 0.01 0.2 9.0 A A

cSH Volume to Capacity Queue Length 95th (m) Control Delay (s/veh) Lane LOS

Volume Total Volume Left Volume Right

Approach Delay (s/veh) Approach LOS

0.0 0.0 0.0 0.0

692 0 0 1700 0.41 0.0

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HCM Unsignalized Intersection Capacity Analysis<2038 Background> Weekday PM Peak Hour 7: Kitchen Road South & Cairns Crescent

																																							⋖	
*	SBR	٢	- 1	-		0.75	6																																Service	
<b>→</b>	SBT	<b>4</b> 5	<b>\$</b> 6	Free	%0	0.75	32	-	3.6	1.2	0		None																										CU Level of Service	
•	NBT	₩,	0 22	O L	%0	69.0	110						None																										೦	
•	NBL	à	\$ 2	\$		69.0	122										43			43	4.1		2.2	92	1576	SB 1	41	0	တ	1700	0.02	0.0	0.0		0.0			6.8	30.7%	15
<i>&gt;</i>	EBR	700	5 5	92		0.50	276										33			93	6.2		3.3	73	1037	NB 1	232	122	0	1576	0.08	2.0	4.2	∢	4.2					
4	EBI	<b>&gt;</b> -	o c	Stor	%0	0.50	9	2	3.6	1.2	0						394			394	6.4		3.5	66	200	EB 1	282	9	276	1019	0.28	9.1	6.6 6	∢	6 <u>.</u> 6	∢			E	
	Novement	-ane Configurations	ranic volume (venin)	Future Volume (Verim)	Grade	Peak Hour Factor	Hourly flow rate (vph)	Pedestrians	-ane Width (m)	Valking Speed (m/s)	Percent Blockage	Right turn flare (veh)	Median type	Median storage veh)	Jpstream signal (m)	pX, platoon unblocked	vC, conflicting volume	/C1, stage 1 conf vol	vC2, stage 2 conf vol	/Cu, unblocked vol	C, single (s)	C, 2 stage (s)	F (s)	p0 queue free %	cM capacity (veh/h)	Direction, Lane #	/olume Total	/olume Left	/olume Right	TŞ.	/olume to Capacity	Queue Length 95th (m)	Control Delay (s/veh)	ane LOS	Approach Delay (s/veh)	Approach LOS	ntersection Summary	Average Delay	ntersection Capacity Utilization	Analysis Period (min)

Proposed Residential Development 20 Cairns Crescent, Huntsville Synchro 12 Report Trans-Plan Page 7

08/18/2025 <2038 Total> Weekday AM Peak Hour 1: Aspin Road/Aspdin Road & Highway 11 Southbound On/Off-Ramp HCM Unsignalized Intersection Capacity Analysis

<2038 Total> Weekday AM Peak Hour

08/18/2025

2: Highway 11 Northbound On/Off-Ramp & Aspdin Road/Main Street West

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EBR

HCM Unsignalized Intersection Capacity Analysis

SBT

SBL

NBR

210

26 26

178

195

0 0

Traffic Volume (veh/h) Future Volume (Veh/h)

Sign Control

Lane Configurations

0.92

0.92 0

0.81

0.81

0.93

0.00

0.88

0.88 0

Peak Hour Factor Hourly flow rate (vph) Pedestrians Lane Width (m) Walking Speed (m/s) Percent Blockage

0.0

Stop 0% 0.92

Stop 0% 0.81

347 347 Free 0% 0.93 373

369 369 Free 0% 0.88 419

(i) (ii) (iii) (ii	WBT 205 205 Free 0.94 218 None	WBR 170 170 8 181 ( )	SBL 179 179 179 179 179 170 1.2 1.2 1.2 1.2 6.5 6.5	236 223 223 223 223 223 6.2
223 223 223 4.6 1116 1116	205 205 205 205 10.94 0.94 218 None			163 163 0.69 236 223 223 6.2
21 0.85 25 223 223 4.6 1116 1116	205 205 7 0.94 0.94 0.09			163 163 236 223 223 223 6.2
23 25 25 223 223 26 88 1116 1116	205 Free 0% 0.94 218 None			163 0.69 236 223 223 223 6.2
(a) 0.85 (b) 25 (c) 0.85 (c) 0	Free 0.94 None			236 223 223 223 6.2
(1) 255 (1) 256 (233 233 246 223 246 223 256 226 256 256 256 256 256 256 256 256	0.94 0.94 218 None			236 223 223 223 6.2
(a) (b) (c) (c) (c) (c) (c) (c) (c) (c) (c) (c	0.94 218 None			236 223 223 6.2
(a) (b) (c) (c) (c) (c) (c) (c) (c) (c) (c) (c	None None			236 223 223 6.2
9) 10 11 11 11 11 11 11 11 11 11 11 11 11	None		3.5 1.2 0 727 727 6.5	223 223 223 6.2
ed 223   116	None		3.6 1.2 0 727 727 6.5	223 223 6.2
9) 1) 223 26 28 4.6 4.6 1116 1116	None		1.2 0 727 727 6.5	223 223 223 6.2
ed 223 no 223 13 223 14.6 2.6 2.6 2.6 2.6 2.6 2.6 2.6 2.6 2.6 2	None		0 727 727 6.5	223 223 6.2
ed 223   116	None		727	223 223 223 6.2
223 ol 223 ol 223 ol 223 14.6 1116 1116 1116	None		727	223 223 6.2
)			727	223 223 6.2
ed 223  la 223  4.6  2.6  98  1116  EB 1 EE  25  25  26  27  1116  17  1116  17			727 727 6.5	223 223 6.2
ed 223			727 727 6.5	223 223 6.2
223 31 223 4.6 2.6 98 1116 1116 17			727 727 6.5	223 223 6.2
223 4.6 2.6 98 1116 EB 1 EE 25 4 25 4 25 0 1116 17			727	223 6.2
223 4.6 2.6 98 1116 EB1 EE 25 4 25 4 25 4 1116 17			727 6.5	223 6.2
223 4.6 2.6 98 1116 EB1 EE 25 4 25 4 0 0			727 6.5	223 6.2
4.6 2.6 9.8 1116 EB1 EE 2.5 4 0 0 1116 17			6.5	6.2
2.6 98 1116 EB1 EE 25 4 0 1116 17				
2.6 98 1116 EB 1 EE 25 4 0 1116 17				
98 1116 EB 1 EE 25 4 25 0 1116 17			3.6	3.3
1116 EB 1 EE 25 4 25 0 1116 17			31	71
25 4 25 4 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0			374	813
25 4 25 0 0 1116 17	WB1	WB 2 S	SB 1	
25 0 1116 17	218	181	495	
0 1116 17	0		259	
1116	0		236	
000	1700		503	
0.02	0.13		96.0	
Queue Length 95th (m) 0.5 0.0	0.0	0.0	105.0	
lay (s/veh) 8.3	0.0		64.9	
ane LOS A			ட	
/ (s/veh)	0.0	•	64.9	
pproach LOS			ட	
ntersection Summary				
4verage Delay	23.5			
acity Utilization	46.9%	COL	CU Level of Service	Service
	15			

378

797

1056

419

797

792

419

378

Median storage veh)
Upstream signal (m)
pX, platron unblocked
vC, conflicting volume
vC1, stage 1 conf vol
vC2, stage 2 conf vol
vC2, unblocked vol

None

None

Right turn flare (veh)

Median type

378

6.5

7.1

6.3

6.5

792

419

378

3.3 100 673

4.0 100 322

3.5 100 119

3.4 58 619

4.0

3.9 88 264

2.2 100 1151

2.2 100 1192

tC, single (s)
tC, 2 stage (s)
tF (s)
p0 queue free %
cM capacity (veh/h)

9

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Cairns Crescent, Huntsville	
Development 20	
Proposed Residential Development 20 Cairns Crescent, Hi	Trans-Plan

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Proposed Residential Development 20 Cairns Crescent, Huntsvi	
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ICU Level of Service

3.7 40.5% 15

Average Delay Intersection Capacity Utilization Analysis Period (min)

291 32 259 259 0.54 0.54 19.2 C

0.0

0 0 0.22 0.0 0.0

222 0 222 0.13 0.13 0.00

Volume Total Volume Left Volume Right

0.25

cSH Volume to Capacity Queue Length 95th (m) Control Delay (s/veh) Lane LOS

0.0

0.0

Approach Delay (s/veh) Approach LOS

HCM Unsignalized Intersection Capacity Analysis 3: Cairns Drive & Main Street West

Movement Lane Configurations Traffic Volume (veh/h) Future Volume (Veh/h) Sign Control Grade Peak Hour Factor Churry flow rate (veh)	EBL	EBT	FRR	WBL					dan	ā	TOS	0
urations ne (veh/h) ne (Veh/h) actor t			נכיי		WBT	WBR	NBL	NBT	NON	SBL	וםפ	SBR
ne (veh/h) ne (Veh/h) actor C	r	*	ĸ.	r	æ,		¥	42			4	
ne (Veh/h) actor C	175	350	54	157	324	156	203	.0	26	147	0	122
actor ate (vph)	175	320	54	157	324	156	203	0	29	147	0	122
our Factor Tow rate (vph)		Free			Free			Stop			Stop	
(hd		%0			%0			%0			%0	
	0.93	0.93	0.93	0.80	0.88	0.88	0.36	0.36	09.0	0.0	0.93	0.93
	188	376	28	196	368	177	564	0	86	163	0	131
Pedestrians		7						2				
ane Width (m)		3.6						3.6				
Valking Speed (m/s)		1.2						1.2				
Percent Blockage		0						0				
Right turn flare (veh)												
Aedian type		None		F	TWLTL							
Aedian storage veh)					2							
lpstream signal (m)												
X. platoon unblocked												
	545			439			1650	1694	381	1699	1664	459
/C1, stage 1 conf vol							757	757		849	849	
VC2, stage 2 conf vol							893	937		820	815	
	545			439			1650	1694	381	1699	1664	459
C, single (s)	1.1			4.1			7.1	6.5	6.2	7.2	6.5	6.3
stage (s)							6.1	5.5		6.2	5.5	
	2.2			2.2			3.5	4.0	3.3	3.6	4.0	3.4
	82			82			0	100	82	0	100	78
oM capacity (veh/h) 11	1024			1100			46	94	999	4	119	287
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1	NB 2	SB 1				
_	188	376	28	196	545	564	86	294				
	188	0	0	196	0	264	0	163				
ne Right	0	0	28	0	177	0	86	131				
	1024	1700	1700	1100	1700	46	899	75				
	0.18	0.22	0.03	0.18	0.32	12.33	0.15	3.92				
Œ	5.4	0.0	0.0	5.2	0.0	Ë	4.1	占				
ay (s/veh)	9.3	0.0	0.0	0.6	0.0	Ē	11.3	Щ				
	⋖			∢		ш	В	ட				
Approach Delay (s/veh)	2.8			2.4	ω	8520.5		ᇤ				
Approach LOS						ш		ш				
ntersection Summary												
Average Delay		3.	3701.5									
ntersection Capacity Utilization		9	%9.89	<u></u>	ICU Level of Service	Service			ပ			
Analysis Period (min)			15									

Proposed Residential Development 20 Cairns Crescent, Huntsville Trans-Plan

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<2038 Total> Weekday AM Peak Hour 08/18/2025 HCM Unsignalized Intersection Capacity Analysis 4: Caims Crescent & Caims Drive

						•	
Movement	EB	EBI	WBT	WBR	SBL	SBR	
Lane Configurations		4	£,		ž		
Traffic Volume (veh/h)	104	4	. 4	159	48	163	
Future Volume (Veh/h)	104	4	4	159	48	163	
Sign Control		Free	Free		Stop		
Grade		%0	%0		%0		
Peak Hour Factor	0.93	0.93	09.0	09.0	0.82	0.82	
Hourly flow rate (vph)	112	4	7	265	29	199	
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	i				0	4	
vC, conflicting volume	717				308	140	
vC1, stage 1 conf vol							
vC2, stage 2 conf vol	į						
vCu, unblocked vol	272				368	140	
tC, single (s)	4.2				6.4	6.2	
tC, 2 stage (s)							
tF (s)	2.3				3.5	3.3	
p0 queue free %	91				6	78	
cM capacity (veh/h)	1257				574	906	
Direction, Lane #	EB 1	WB 1	SB 1				
Volume Total	116	272	258				
Volume Left	112	0	26				
Volume Right	0	265	199				
cSH	1257	1700	800				
Volume to Capacity	0.00	0.16	0.32				
Queue Length 95th (m)	2.3	0.0	11.2				
Control Delay (s/veh)	7.9	0.0	11.6				
Lane LOS	⋖		ω				
Approach Delay (s/veh)	7.9	0.0	11.6				
Approach LOS			Ω				
Intersection Summary							
Average Delay			6.1				
Intersection Capacity Utilization	ation		38 7%	<u></u>	ava	CLLI evel of Service	4
The condition of the control of the							

Proposed Residential Development 20 Cairns Crescent, Huntsville Trans-Plan

HCM Unsignalized Intersection Capacity An 5: Access & Cairns Crescent

<2038 Total> Weekday AM Peak Hour	78/18/2025
nalysis	

	†	/	<b>\</b>	ļ	•	•	
Movement	EBT	EBR	WBL	WBT	NBL	NBR	
Lane Configurations	æ			÷	ž		
Traffic Volume (veh/h)	0	9	6	0	70	31	
Future Volume (Veh/h)	0	9	6	0	70	31	
Sign Control Grade	Free 0%			Free 0%	Stop 0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	0	7	10	0	22	34	
Pedestrians							
Lane Width (m)							
Walking Speed (m/s)							
Percent Blockage							
Right turn flare (veh)							
	None			None			
Median storage veh)							
Upstream signal (m)							
pX, platoon unblocked							
vC, conflicting volume			7		54	4	
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol			7		54	4	
tC, single (s)			4.		6.4	6.2	
tC, 2 stage (s)							
tF (s)			2.2		3.5	3.3	
p0 queue free %			66		86	97	
cM capacity (veh/h)			1614		986	1080	
Direction, Lane #	EB 1	WB 1	NB 1				
Volume Total	7	10	26				
Volume Left	0	10	22				
Volume Right	7	0	34				
cSH	1700	1614	1041				
Volume to Capacity	0.00	0.01	0.05				
Queue Length 95th (m)	0.0	0.1	1.4				
Control Delay (s/veh)	0.0	7.2	8.7				
Lane LOS		⋖	⋖				
Approach Delay (s/veh)	0.0	7.2	8.7				
Approach LOS			⋖				
Intersection Summary							
Average Delay			9.7				
Intersection Capacity Utilization			17.2%	ਹ	ICU Level of Service	Service	¥
Analysis Period (min)			15				

Proposed Residential Development 20 Cairns Crescent, Huntsville Trans-Plan

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HCM Unsignalized Intersection Capacity Analysis <2038 Total> Weekday AM Peak Hour 6: Kitchen Road South/Kithcen Road South & Main Street West/Main StreetWest 08/18/2025

Movement   EBL   EBT   EBR   WBL   WBT   WBT   NBT   NBT   NBT   SBL   SBT   SBR   SBL   SBT   SBR   SBL   SBT   SBR   SBL   SBL   SBT   SBR   SBL		•	<b>†</b>	>	/	ţ	4	•	<b>←</b>	•	٠	<b>→</b>	•
orifigurations	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Colume (verly)         3         513         17         39         604         0         7         0         9         0         0           Advalume (verly)         Free         Free         7         0         80         0         0           Advalume (verly)         Free         0%         0%         0%         0%         0         0           Over Factor         0.78         0.78         0.78         0.78         0.88         0.88         0.64         0         0         0         0         0           One reactor         0.78         0.78         0.88         0.88         0.64         0         1         0         0         0         0         0           Index (verl)         4         658         2         4         668         0	Lane Configurations	×	2		×	*			4			£3	
Volume (Vehith)         3         513         17         39         604         0         7         0         80         0         0           own reactor         0.78         0.78         0.78         0.88         0.88         0.84         0.64         0.64         0.64         0.75         0%           our Factor         0.78         0.78         0.88         0.88         0.84         0.64         0.64         0.64         0.75         0%           our Factor         0.78         0.78         0.88         0.88         0.84         0.64         0.64         0.64         0.75         0%           our Factor         0.78         0.78         0.88         0.88         0.84         0.64         0.64         0.64         0.75         0%           our Factor         0.78         0.88         0.88         0.88         0.88         0.84         0.75 </td <td>Traffic Volume (veh/h)</td> <td>ო</td> <td>513</td> <td>17</td> <td>39</td> <td>604</td> <td>0</td> <td>7</td> <td>0</td> <td>8</td> <td>0</td> <td>0</td> <td>2</td>	Traffic Volume (veh/h)	ო	513	17	39	604	0	7	0	8	0	0	2
Price         Free         Free         Stop         Stop <t< td=""><td>Future Volume (Veh/h)</td><td>က</td><td>513</td><td>17</td><td>33</td><td>604</td><td>0</td><td>7</td><td>0</td><td>8</td><td>0</td><td>0</td><td>2</td></t<>	Future Volume (Veh/h)	က	513	17	33	604	0	7	0	8	0	0	2
our Factor         0%         0 <th< td=""><td>Sign Control</td><td></td><td>Free</td><td></td><td></td><td>Free</td><td></td><td></td><td>Stop</td><td></td><td></td><td>Stop</td><td></td></th<>	Sign Control		Free			Free			Stop			Stop	
178   0.78   0.78   0.88   0.88   0.64   0.64   0.64   0.75   0.75     4   658   22   44   686   0   11   0   125   0   0     1	Grade		%0			%0			%0			%0	
Here See 22 44 686 0 11 0 125 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Peak Hour Factor	0.78	0.78	0.78	0.88	0.88	0.88	0.64	0.64	0.64	0.75	0.75	0.75
TWLTL	Hourly flow rate (vph)	4	658	22	4	989	0	Ξ	0	125	0	0	က
3.6 3.6 1.2 1.2 1.2 1.2 1.2 1.2 1.2 1.2 1.2 1.2	Pedestrians					-			_				
TWLTL None	Lane Width (m)					3.6			3.6				
TWLTL None	Walking Speed (m/s)					1.2			1.2				
HANTL None 686 681 1455 1452 671 1566 1463 689 689 689 681 1455 1452 671 1566 1463 689 689 689 689 681 1455 1455 671 1566 1463 689 689 689 689 689 689 689 689 689 689	Percent Blockage					0			0				
TWLTL None  686 681 681 1455 1452 671 1566 1463 681 481 481 481 481 481 481 481 481 481 4	Right turn flare (veh)												
See	Median type		TWLTL			None							
686 681 1455 1452 671 1566 1463 689 689 689 689 689 689 689 689 689 689	Median storage veh)		2										
1456   1453   1452   1452   1453	Upstream signal (m)												
686   681   1455   1452   671   1566   1463   o	pX, platoon unblocked												
Fig.	vC, conflicting volume	989			681			1455	1452	671	1566	1463	989
686 681 777 774 774 779 689 4.1 4.1 4.1 4.1 4.1 774 774 774 779 689 4.1 4.1 4.1 4.1 4.1 7.1 6.1 5.5 6.2 7.1 1566 1463 1463 1462 1462 1463 1463 1463 1463 1463 1463 1463 1463	vC1, stage 1 conf vol							829	678		774	774	
March Capacity (shelf)   686   681   1455   1452   671   1566   1463   1465	vC2, stage 2 conf vol							111	774		792	689	
ggle (s)         4.1         4.1         6.1         6.5         6.2         7.1         6.5           stage (s)         2.2         2.2         3.5         6.1         5.5         7.1         6.5         7.1         6.5           aue free %         100         95         96         100         73         40         100         100           pacity (veh/h)         917         WB 1         MB 2         NB 1         SB 3         3.5         4.0         100 </td <td>vCu, unblocked vol</td> <td>989</td> <td></td> <td></td> <td>681</td> <td></td> <td></td> <td>1455</td> <td>1452</td> <td>671</td> <td>1566</td> <td>1463</td> <td>989</td>	vCu, unblocked vol	989			681			1455	1452	671	1566	1463	989
stage (s)  2.	tC, single (s)	4.1			4.			7.1	6.5	6.2	7.1	6.5	6.2
Lee Tee %         2.2         2.2         3.5         4.0         3.3         3.5         4.0           pacity (verhit)         910         95         96         100         73         100         100           pacity (verhit)         917         WB 1         WB 2         NB 1         SB 1         459         202         299         400         1	tC, 2 stage (s)							6.1	5.5		6.1	5.5	
bed by the back of	tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	33
pacify (veh/h)         917         920         293         311         459         202         299           ion_Lane #         EB 1         EB 2         WB 1         MB 2         NB 1         SB 1         459         202         299         290 <td>p0 queue free %</td> <td>100</td> <td></td> <td></td> <td>32</td> <td></td> <td></td> <td>96</td> <td>100</td> <td>73</td> <td>100</td> <td>100</td> <td>66</td>	p0 queue free %	100			32			96	100	73	100	100	66
ion, Lane #         EB 1         EB 2         WB 1         WB 2         NB 1         SB 1           ne Total         4         680         44         686         136         3           ne Leff         0         22         0         11         0           ne Right         917         1700         920         1700         439         451           ne Locapacity         0.00         0.40         0.05         0.40         0.31         0.01           ne Locapacity         0.00         0.40         0.05         0.40         0.31         0.01           ne Locapacity         0.00         0.40         0.05         0.40         0.01         0.01           ne Locapacity         0.00         0.40         0.05         0.40         0.31         0.01           LOS         A         A         A         C         B           act Delay (siveh)         0.1         0.5         16.8         13.0           A         A         A         C         B           action Summary         1.8         CUL Level of Service           A         0.00         0.00         0.00           B         0.00	cM capacity (veh/h)	917			920			293	311	429	202	599	451
ne Total 4 680 44 686 136 3  ne Lett 4 0 44 06 136 3  ne Lett 4 0 14 00 11 0  ne Lett 4 0 11 0  ne Lett 1 0 2 0 0 12 3  ne Le Capacity 0.00 0.40 0.05 0.40 0.31 0.01  ne to Capacity 0.00 0.40 0.05 0.40 0.31 0.01  LOS A A A C B  ach Delay (siveh) 0.1 0.5 16.8 13.0  ach Delay (siveh) 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1	Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
ne Left 4 0 44 0 11 0 0 1	Volume Total	4	089	44	989	136	3						
ne Right 0 22 0 0 125 3  1917 1700 920 1700 439 451  1917 1700 920 1700 439 451  1918 171 1700 920 1700 439 451  1919 171 1700 920 1700 439 451  1919 1700 920 1700 439 451  1919 1700 920 1700 439 451  1919 1700 920 1700 920  1919 1700 920 920  1919 1700 920  1910 1700 920  19	Volume Left	4	0	4	0	7	0						
e to Capacity 917 1700 920 1700 439 451 e to Capacity 0.00 0.40 0.05 0.40 0.31 0.01 0.01 0.02 0.40 0.05 0.40 0.31 0.01 0.02 0.00 0.04 0.05 0.40 0.02 0.02 0.00 0.01 0.0 0.02 0.00 0.01 0.0 0.01 0.0 0.02 0.00 0.01 0.0 0.01 0.0 0.00 0.0	Volume Right	0	22	0	0	125	က						
0.00 0.40 0.05 0.40 0.31 0.01 0.01 0.01 0.01 0.01 0.00 0.1.2 0.0 10.4 0.2 0.2 0.0 1.2 0.0 10.4 0.2 0.2 0.0 0.3 0.3 0.0 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5	SSH	917	1700	920	1700	439	451						
0.1 0.0 1.2 0.0 10.4 0.2 8.9 0.0 9.1 0.0 16.8 13.0 A A C B C B C B C B 13.0 C B 14.0 18 18 18 15.0 Idization 50.8% ICU Level of Service	Volume to Capacity	0.00	0.40	0.05	0.40	0.31	0.01						
8.9 0.0 9.1 0.0 16.8 13.0 A A C B C B C B C B L3.0 C B L3.8 Hization 50.8% ICU Level of Service	Queue Length 95th (m)	0.1	0.0	1.2	0.0	10.4	0.2						
A A C B 0.1 0.5 16.8 13.0 C B 1.8 Ilization 50.8% ICU Level of Service	Control Delay (s/veh)	8.9	0.0	9.1	0.0	16.8	13.0						
0.1 0.5 16.8 13.0 C B C B II.8 1.8 ICU Level of Service 15	Lane LOS	∢		∢		ပ	മ						
C B  1.8  Utilization 50.8% ICU Level of Service  15	Approach Delay (s/veh)	0.1		0.5		16.8	13.0						
1.8 Utilization 50.8% ICU Level of Service 15	Approach LOS					ပ	മ						
1.8 Utilization 50.8% ICU Level of Service 15	Intersection Summary												
Utilization 50.8% ICU Level of Service 15	Average Delay			1.8									
	Intersection Capacity Utilization	<u></u>		20.8%	೦	U Level o	f Service			⋖			
	Analysis Period (min)			15									

Proposed Residential Development 20 Cairns Crescent, Huntsville Trans-Plan

HCM Unsignalized Intersection Capacity Analysis <2038 Total> Weekday AM Peak Hour 7: Kitchen Road South & Cairns Crescent

7: Kitchen Road South & Cairns Crescent	ih & C	airns (	resce	nt			08/18/2025
	4	<i>&gt;</i>	•	•	<b>→</b>	*	
Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations	<u>&gt;</u>			4	¢\$		
Traffic Volume (veh/h)	37	40	136	45	52	16	
Future Volume (Veh/h)	37	40	136	45	52	16	
Sign Control	Stop			Free	Free		
Grade	%0			%0	%0		
Peak Hour Factor	0.50	0.50	0.65	0.65	09.0	09.0	
Hourly flow rate (vph)	74	80	500	69	45	27	
Pedestrians	14			17	က		
Lane Width (m)	3.6			3.6	3.6		
Walking Speed (m/s)	1.2			1.2	1.2		
Percent Blockage	τ-			-	0		
Right turn flare (veh)							
Median type				None	None		
Median storage veh)							
Upstream signal (m)							
pX, platoon unblocked							
vC, conflicting volume	260	87	83				
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	260	87	83				
tC, single (s)	6.4	7.2	4.1				
tC, 2 stage (s)							
tF (s)	3.5	4.2	2.2				
p0 queue free %	85	88	98				
cM capacity (veh/h)	415	739	1509				
Direction, Lane #	EB 1	NB 1	SB 1				
Volume Total	154	278	69				
Volume Left	74	500	0				
Volume Right	8	0	27				
cSH	537	1509	1700				
Volume to Capacity	0.29	0.14	0.04				
Queue Length 95th (m)	9.4	3.8	0.0				
Control Delay (s/veh)	14.4	6.1	0.0				
Lane LOS	В	∢					
Approach Delay (s/veh)	14.4	6.1	0.0				
Approach LOS	മ						
Intersection Summary							
Average Delay			7.8				
Intersection Capacity Utilization	_		32.0%	ಠ	ICU Level of Service	f Service A	
Allaysis Fellou (IIIIII)			2				

Proposed Residential Development 20 Cairns Crescent, Huntsville Synchro 12 Report Trans-Plan Page 7

HCM Unsignalized Intersection Capacity Analysis <2038 Total> Weekday PM Peak Hour 1: Aspin Road/Aspdin Road & Highway 11 Southbound On/Off-Ramp 08/18/2025

HCM Unsignalized Intersection Capacity Analysis <2038 Total> Weekday PM Peak Hour 2: Highway 11 Northbound On/Off-Ramp & Aspdin Road/Main Street West 08/18/2025

576 259 273 1 576 259 273 1 Free Free S 0% 0% 0% 0 0.77 0.87 0 748 298 314 1	146 207 146 207 Stop 0% 0.91 0.91 160 227
269 273 Free 0% 0.87 0.87 298 314	
259 273 Free 0% 0.87 0.87 298 314	
Free 0% 0% 0.87 2.98 3.14 None	
0% 0.87 0.87 298 3.14 None	
0.87 0.87 0.87 None	
. 288 314 None	
None	
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<b>F</b>	
	1100 298
	6.4 6.2
	30 69
7	
EB 2 WB 1 WB 2 SB 1	1
298 314	387
	160
0 314	227
1700 1700	384
0.18 0.18	7
6 0.0 0.0 0.0	97.9
0.0 0.0	.3 .3
⋖	ıL
8 0.0	81.3
	ш
57.8% ICU Le	ICU Level of Service

Proposed Residential Development 20 Cairns Crescent, Huntsville Synchro 12 Report Trans-Plan Page 1

ort Proposed Residential Development 20 Cairns Crescent, Huntsville
Trans-Plan

	4	†	<u> </u>	<b>/</b>	ļ	4	•	<b>←</b>	•	٠	<b>→</b>	•
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		*	ĸ.		*	*		Þ				
Traffic Volume (veh/h)	0	202	215	0	202	286	56	0	317	0	0	0
Future Volume (Veh/h)	0	202	215	0	202	286	56	0	317	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		%0			%0			%0			%0	
Peak Hour Factor	0.83	0.83	0.83	0.89	0.89	0.89	0.83	0.83	0.83	0.92	0.92	0.92
Hourly flow rate (vph)	0	611	259	0	267	321	31	0	382	0	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	267			611			1178	1178	611	1560	1178	267
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	292			611			1178	1178	611	1560	1178	267
tC, single (s)	4.1			4.1			7.2	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.0	3.3	3.5	4.0	3.3
p0 queue free %	10			100			8	100	23	19	10	100
cM capacity (veh/h)	1015			978			161	192	496	51	192	527
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1							
Volume Total	611	259	267	321	413							
Volume Left	0	0	0	0	31							
Volume Right	0	259	0	321	382							
cSH	1700	1700	1700	1700	429							
Volume to Capacity	0.36	0.15	0.33	0.19	96.0							
Queue Length 95th (m)	0.0	0.0	0.0	0.0	92.0							
Control Delay (s/veh)	0.0	0.0	0.0	0.0	99.1							
Lane LOS					ш							
Approach Delay (s/veh)	0.0		0.0		66.1							
Approach LOS					ட							
Intersection Summary												
Average Delay			12.6									
Intersection Capacity Utilization	L		54.4%	<u> </u>	J Level o	ICU Level of Service			∢			
Analysis Period (min)			15									

<2038 Total> Weekday PM Peak Hour 08/18/2025 HCM Unsignalized Intersection Capacity Analysis 3: Cairns Drive & Main Street West

FBL   EBT   EBR   WBL   WBT   WBF   NBL   NBT		1	†	<u> </u>	<b>/</b>	ļ	4	•	<b>←</b>	•	۶	<b>→</b>	•
Ovigunations         Image: Part of the configurations (which)	lovement	EB	EBT	EBR	WBL	WBT	WBR	NB.	NBT	NBR	SBL	SBT	SBR
Volume (vehf)         121         550         154         54         506         120         160         0         85         166         0           Volume (vehf)         121         550         154         54         54         506         120         160         0         85         166         0           Autornal (vehf)         142         647         181         59         550         130         222         0.70         0.70         0.70         0.85 <t< td=""><td>ane Configurations</td><td>*</td><td>*</td><td>*</td><td>r</td><td>43</td><td></td><td>*</td><td>£,</td><td></td><td></td><td>4</td><td></td></t<>	ane Configurations	*	*	*	r	43		*	£,			4	
Volume (Verhit)         121         550         154         54         506         120         160         6         166         0           own of Factor         0.86         0.86         0.86         0.86         0.80         0.92         0.70         <	affic Volume (veh/h)	121	220	154	25	206	120	160	0	82	166	0	199
Property	uture Volume (Veh/h)	121	220	154	24	206	120	160	0	82	166	0	199
our Factor         0.86         0.96	gn Control		Free			Free			Stop			Stop	
0.85 0.85 0.85 0.92 0.92 0.70 0.70 0.70 0.85 0.85 142 647 181 59 550 130 229 0 121 195 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	rade		%0			%0			%0			%0	
142   647   181   59   550   130   229   0   121   195   0	eak Hour Factor	0.85	0.85	0.85	0.92	0.92	0.92	0.70	0.70	0.70	0.85	0.85	0.85
None	ourly flow rate (vph)	142	647	181	29	550	130	229	0	121	195	0	234
None	edestrians												
None	ane Width (m)												
None	alking Speed (m/s)												
None   TWLTL   R33   1729   647   1785   1845   680   828   1833   1729   647   1785   1845   680   828   1833   1729   647   1785   1845   680   828   1833   1729   647   1785   1845   680   828   1833   1729   647   1785   1845   680   828   1833   1729   647   1785   1845   680   680   828   1833   1729   647   1785   1845   6815	ercent Blockage												
None	ght turn flare (veh)												
Part	edian type		None			WLTL							
680 828 1833 1729 647 1785 1845 680 828 1828 1729 647 1785 1845 4.1 4.1 4.1 4.1 6.5 6.2 778 680 828 182 798 1052 1112 2.2 2.2 2.2 3.5 4.0 3.3 3.5 4.0 85 93 072 798 1729 647 1785 1845 114 647 181 59 680 229 121 429 10 0 181 59 680 229 121 429 10 0 181 59 680 229 0 195 10 0 181 0 130 0 121 234 10 0 181 1700 26 475 190 10.5 0.38 0.11 0.07 0.40 8.87 0.25 2.26 4.3 0.0 0.0 1.9 0.0 Err 8.0 276.2 A A A A F C F A A A A G547.4 621.5 B G647.4 621.5 B G780 C C F F F F F F F F F F F F F F F F F F	edian storage veh)					2							
680 828 1833 1729 647 1785 1845 680 828 1823 1729 647 1785 1845 4.1 4.1 4.1 5.1 6.5 6.2 7.1 6.5 2.2 2.2 2.2 3.5 4.0 6.1 5.5 6.2 7.1 6.5 85 93 07 170 7 0.0 121 2.2 0.1 10.0 7.5 0.1 10.0 10.0 10.0 10.0 10.0 10.0 10.	ostream signal (m)												
680 828 1833 1729 647 1785 1845 1845 680 828 1833 1729 647 1785 1845 1412 680 828 1833 1729 647 1785 1845 1412 641 1845 1845 1845 1845 1845 1845 1845 18	(, platoon unblocked												
Section	), conflicting volume	089			828			1833	1729	647	1785	1845	615
Secondary   Seco	31, stage 1 conf vol							931	931		733	733	
680 828 1833 1729 647 1785 1845 4.1 4.1 4.1 6.5 6.2 7.1 6.5 2.2 2.2 2.2 3.5 4.0 3.3 3.5 4.0 85 93 0 100 75 0 100 922 812 812 82 189 475 110 168  EB1 EB2 EB3 WB1 WB2 NB1 NB2 SB1 142 647 181 59 680 229 0 121 429 0 0 181 0 130 0 121 234 0 0 181 1 0.07 0.40 8.87 0.25 2.26 1.3 0.0 0.0 19.9 0.0 Err 8.0 276.2 A A A B A F C F A A A B C547.4 621.5 A A A G547.4 621.5 A A A G547.4 621.5 B C102.0 B	2, stage 2 conf vol							902	798		1052	1112	
4.1 4.1 4.1 7.1 6.5 6.2 7.1 6.5  2.2 2.2 2.2 3.5 4.0  8.5 93 0 100 75 0 100  9.2 812 812 812 814 4.0  9.2 812 812 814 815 814 815 110 168  EB1 EB2 EB3 WB1 WB2 NB1 NB2 SB1  142 647 181 59 680 229 121 429  0 181 0 130 0 121 429  0 181 1 0 07 0 181 10 07 121 234  9.2 1700 1700 812 1700 26 475 190  0.15 0.38 0.11 0.07 0.40 887 0.25 2.26  4.3 0.0 0.0 1.9 0.0 Err 8.0 2662  A A A F C F  A A A G547.4 621.5  A A A F C B F  F F  Idization 187% ICU Level of Service D	u, unblocked vol	089			828			1833	1729	647	1785	1845	615
22 2.2 2.2 3.5 4.0 3.3 3.5 4.0 8.6 9.3 4.0 8.6 9.3 4.0 9.2 8.1 5.5 4.0 9.2 9.2 8.12 8.12 8.12 8.12 8.12 8.12 8.12 8.	, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
2.2	, 2 stage (s)							6.1	5.5		6.1	5.5	
85 93 0 100 75 0 100 922 812 812	(s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
922 812 812 NB 1 NB 2 SB 1 110 168   EB 1 EB 2 EB 3 WB 1 WB 2 NB 1 NB 2 SB 1 1 142 647 181 59 680 229 121 429   0 0 181 0 59 0 0 229 0 195   0 0 181 0 1700 28 475 190   0.15 0.38 0.11 0.07 0.40 887 0.25 2.26   4.3 0.0 0.0 1.9 0.0 Err 8.0 276.2   9.6 0.0 0.0 9.8 0.0 Err 8.0 276.2   A A A F F C F F F C F F F C F F F F C F	dnene free %	82			63			0	100	75	0	190	25
EB 1         EB 2         EB 3         WB 1         WB 2         NB 1         NB 2         SB 1           142         647         181         59         680         229         121         429           142         0         0         181         0         121         429           922         1700         181         0         121         234           922         1700         1700         812         1700         26         475         190           0.15         0.38         0.11         0.07         0.40         887         0.25         2.26           4.3         0.0         0.0         1.9         0.0         Err         15.2         62.15           A         A         A         F         F         F         F           1.4         0.8         6547.4         C21.5         F         F           1.4         0.8         6547.4         C21.5         F           1.4         0.8         6547.4         C21.5         F           1.5         1.029.0         1.01 Level of Service         F	f capacity (veh/h)	922			812			56	189	475	110	168	489
142 647 181 59 680 229 121 429 142 0 0 59 0 229 0 195 142 0 0 181 0 39 0 129 0 195 0 181 1700 181 1700 26 475 190 0 1.15 0.38 0.11 0.07 0.40 8.87 0.25 2.26 4.3 0.0 0.0 1.9 0.0 Err 8.0 276.2 9.6 0.0 0.0 9.8 0.0 Err 15.2 621.5 A A A A F F C F F G F Idization 1029.0 Idization 187.7% ICU Level of Service	rection, Lane #	EB 1	EB 2	EB3	WB 1	WB 2	NB 1	NB 2	SB 1				
142 0 0 59 0 229 0 195 0 0 181 0 130 0 121 234 922 1700 1700 812 1700 26 475 190 0.15 0.38 0.11 0.07 0.40 8.87 0.25 2.26 4.3 0.0 0.0 1.9 0.0 Err 8.0 276.2 9.6 0.0 0.0 9.8 0.0 Err 8.0 276.2 1.4 A A A A F F C F 1.4 0.8 6547.4 621.5 F F 1 1.4 0.8 1029.0 Idization 187.7% ICU Level of Service	lume Total	142	647	181	29	089	229	121	429				
0 0 181 0 130 0 121 234 922 1700 1700 812 1700 26 475 190 0.15 0.38 0.11 0.07 0.40 8.87 0.25 2.26 9.6 0.0 0.0 9.8 0.0 Err 8.0 276.2 9.6 0.0 0.0 9.8 0.0 Err 15.2 621.5 9.14 0.8 6547.4 621.5 9.14 0.8 6547.4 621.5 9.15 0.0 0.0 9.8 0.0 Err 15.0 1.5 9.15 0.0 0.0 0.0 9.8 0.0 Err 15.0 1.5 9.15 0.0 0.0 0.0 9.8 0.0 Err 15.0 1.5 9.15 0.0 0.0 0.0 9.8 0.0 Err 15.0 1.5 9.15 0.0 0.0 0.0 9.8 0.0 Err 15.0 1.5 9.15 0.0 0.0 0.0 9.8 0.0 Err 15.0 1.5 9.15 0.0 0.0 0.0 0.0 9.8 0.0 Err 15.0 1.5 9.15 0.0 0.0 0.0 0.0 0.0 0.0 1.5 9.15 0.0 0.0 0.0 0.0 0.0 0.0 0.0 1.5 9.15 0.0 0.0 0.0 0.0 0.0 0.0 0.0 1.5 9.15 0.0 0.0 0.0 0.0 0.0 0.0 0.0 1.5 9.15 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 1.5 9.15 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	olume Left	142	0	0	29	0	229	0	195				
922 1700 1700 812 1700 26 475 190 0.15 0.38 0.11 0.07 0.40 8.87 0.25 2.26 4.3 0.0 0.0 1.9 0.0 Err 8.0 276.2  A A F F C F  1.4 0.8 6547.4 621.5  1.22.0  1029.0  1029.0  112ation 18.7 ICU Level of Service 15 12 12 12 12 12 12 12 12 12 12 12 12 12	olume Right	0	0	181	0	130	0	121	234				
0.15 0.38 0.11 0.07 0.40 8.87 0.25 2.26 4.3 0.0 0.0 1.9 0.0 Err 8.0 276.2 9.6 0.0 0.0 9.8 0.0 Err 15.2 621.5 1.4 A A F F G21.5 1.4 0.8 6547.4 621.5 1029.0 Idization 187.7 ICU Level of Service	<b>.</b>	922	1700	1700	812	1700	56	475	190				
143 0.0 0.0 1.9 0.0 Err 8.0 276.2 9.6 0.0 0.0 9.8 0.0 Err 15.2 621.5 P. C. L.	olume to Capacity	0.15	0.38	0.11	0.07	0.40	8.87	0.25	2.26				
siveh) 9.6 0.0 0.0 9.8 0.0 Err 15.2 621.5  A A F C F C F C F Minary  1029.0  1031.0 Lilization  104.0  105.0  107.0  108.0  109.0  109.0  109.0  109.0  109.0  109.0	nene Length 95th (m)	4.3	0.0	0.0	1.9	0.0	Ü	8.0	276.2				
(s/veh) 1.4 A A F C F C F C F C F C F C F C F C F C	ontrol Delay (s/veh)	9.6	0.0	0.0	8.6	0.0	Ē	15.2	621.5				
/ (s/veh) 1.4 0.8 6547.4 621.5  F F F  mmary 1029.0  78.7% ICU Level of Service (min) 15	Ine LOS	⋖			∢		ட	ပ	ட				
many 1029.0 roule of Service (min) 15	oproach Delay (s/veh)	4.			8.0		5547.4		621.5				
/ 1029.0 Utilization 78.7% ICU Level of Service 15	oproach LOS						ட		ட				
1029.0 Utilization 78.7% ICU Level of Service 15	tersection Summary												
Utilization 78.7% ICU Level of Service 15	rerage Delay			1029.0									
	tersection Capacity Utilizati	lon		78.7%	<u>ਹ</u>	J Level o	f Service			۵			
	Analysis Period (min)			15									

Synchro 12 Report Page 3 Proposed Residential Development 20 Cairns Crescent, Huntsville Trans-Plan

HCM Unsignalized Intersection Capacity Analysis 4: Caims Crescent & Caims Drive

<2038 Total> Weekday PM Peak Hour 08/18/2025

	4	<b>†</b>	ţ	4	٠	•	
Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations		4	£		Þ		
Traffic Volume (veh/h)	144	4	4	100	157	51	
Future Volume (Veh/h)	144	4	4	9	157	51	
Sign Control		Free	Free		Stop		
Grade		%0	%		%0		
Peak Hour Factor	0.80	0.80	0.88	0.88	98.0	98.0	
Hourly flow rate (vph)	180	2	Ω	114	183	59	
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	119				427	62	
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	119				427	62	
tC, single (s)	4.1				6.4	6.2	
tC, 2 stage (s)							
tF (s)	2.2				3.5	3.3	
p0 queue free %	88				94	94	
cM capacity (veh/h)	1475				208	1009	
Direction, Lane #	EB 1	WB 1	SB 1				
Volume Total	185	119	242				
Volume Left	180	0	183				
Volume Right	0	114	29				
cSH	1475	1700	218				
Volume to Capacity	0.12	0.07	0.42				
Queue Length 95th (m)	3.3	0.0	16.5				
Control Delay (s/veh)	9.7	0.0	15.6				
Lane LOS	⋖		ပ				
Approach Delay (s/veh)	9.7	0.0	15.6				
Approach LOS			ပ				
Intersection Summary							
Average Delay			9.5				
Intersection Capacity Utilization	5		33.3%	<u></u>	) Level o	ICU Level of Service	¥
Analysis Period (min)			15				

Proposed Residential Development 20 Caims Crescent, Huntsville Trans-Plan

HCM Unsignalized Intersection Capacity A 5: Access & Cairns Crescent

<2038 Total> Weekday PM Peak Hour	08/18/2025
Analysis	

<2038 Total> Weekday PM Peak Hour

HCM Unsignalized Intersection Capacity Analysis <2038 Total> Weekday PM Peak Hour 6: Kitchen Road South/Kithcen Road South & Main Street West/Main StreetWest 08/18/2025

EBR

9 9

Traffic Volume (veh/h) Future Volume (Veh/h) Sign Control

Lane Configurations

753 753 753 Free 0% 0.88

0.88

0.88 6

Peak Hour Factor Hourly flow rate (vph)

TWLTL 2

Median type

Pedestrians
Lane Width (m)
Walking Speed (m/s)
Percent Blockage
Right turn flare (veh)

	†	/	<b>\</b>	ļ	•	•	
Movement	EBT	EBR	WBL	WBT	BE	NBR	
Lane Configurations	æ			4	>		
Traffic Volume (veh/h)	0	17	22	0	Ξ	16	
Future Volume (Veh/h)	0	17	52	0	Ξ	16	
Sign Control	Free 7%			Free %	Stop 0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	0	18	27	0	12	17	
Pedestrians							
Lane Width (m)							
Walking Speed (m/s)							
Percent Blockage							
Right turn flare (veh)							
	None			None			
Median storage veh)							
Upstream signal (m)							
pX, platoon unblocked							
vC, conflicting volume			18		63	0	
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol			9		63	o	
tC, single (s)			4.1		6.4	6.2	
tC, 2 stage (s)							
tF(s)			2.2		3.5	3.3	
p0 queue free %			88		66	86	
cM capacity (veh/h)			1599		927	1073	
Direction, Lane #	EB 1	WB 1	NB 1				
Volume Total	18	27	59				
Volume Left	0	27	12				
Volume Right	18	0	17				
cSH	1700	1599	1007				
Volume to Capacity	0.01	0.02	0.03				
Queue Length 95th (m)	0.0	4.0	0.7				
Control Delay (s/veh)	0.0	7.3	8.7				
Lane LOS		⋖	⋖				
Approach Delay (s/veh)	0.0	7.3	8.7				
Approach LOS			⋖				
Intersection Summary							
Average Delay			6.1				
Intersection Capacity Utilization			18.1%	<u></u>	ICU Level of Service	Service	4
Analysis Period (min)			15				

Proposed Residential Development 20 Cairns Crescent, Huntsville Trans-Plan

Synchro 12 Report Page 5

3.3 0.38 692 692 926 887 1813 6.5 5.5 4.0 97 Stop 0% 0.38 2001 926 1075 2001 7.1 6.1 3.5 100 0 0.38 SBL NBR 66 0.50 864 864 3.3 1808 882 926 1808 6.5 5.5 4.0 97 3 0% 0.50 3.6 0.50 882 929 929 7.1 6.1 6.1 3.5 92 0.93 **WBR** 0.03 0.03 0.6 24.0 C 220 16 198 334 0.66 35.4 34.4 D 644 644 Free 0% 0.93 692 None 0.93 4.1 2.2 85 783 109 869 692 0.00

4.1

Madian storage veh)
Upstream signal (m)
Dy patron unblocked
VC, conflicting volume
VC, stage 1 conf vol
VCL, stage 2 conf vol
VCL, stage 8 (s)
TC, stage (s)
TC, stage (s)
DQ queue free %
CM capacity (veh/h)

692

2.2 99 912

Proposed Residential Development 20 Cairns Crescent, Huntsville Trans-Plan

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ပ

ICU Level of Service

4.7 69.7% 15

Average Delay Intersection Capacity Utilization Analysis Period (min)

117 0 0.15 4.2 4.2 10.4 B

11 0.51 0.0 0.0

0.01 0.02 9.0 A A

Volume Total
Volume Left
Volume Left
Volume Right
cSH
Volume to Capacity
Queue Length 95th (m)
Control Delay (siveh)
Lane LOS
Approach Delay (siveh)
Approach LOS

867

HCM Unsignalized Intersection Capacity Analysis <2038 Total> Weekday PM Peak Hour 7: Kitchen Road South & Cairns Crescent 08/18/2025

	4	1	*	+	_	•	
	,	•	-	-	•	,	
Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations	>			₩	42		
Traffic Volume (veh/h)	19	138	8	9/	54	32	
Future Volume (Veh/h)	19	138	84	9/	54	32	
Sign Control	Stop			Free	Free		
Grade	%0			%0	%0		
Peak Hour Factor	0.50	0.50	0.69	0.69	0.75	0.75	
Hourly flow rate (vph)	38	276	122	110	35	43	
Pedestrians	7				_		
Lane Width (m)	3.6				3.6		
Walking Speed (m/s)	1.2				1.2		
Percent Blockage	0				0		
Right turn flare (veh)							
Median type				None	None		
Median storage veh)							
Upstream signal (m)							
pX, platoon unblocked							
vC, conflicting volume	411	26	11				
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	411	20	11				
tC, single (s)	6.4	6.2	4.1				
tC, 2 stage (s)							
tF (s)	3.5	3.3	2.2				
p0 queue free %	93	73	92				
cM capacity (veh/h)	225	1015	1532				
Direction, Lane #	EB 1	NB 1	SB 1				
Volume Total	314	232	75				
Volume Left	38	122	0				
Volume Right	276	0	43				
SSH	922	1532	1700				
Volume to Capacity	0.34	0.08	0.04				
Queue Length 95th (m)	12.2	2.1	0.0				
Control Delay (s/veh)	10.9	4.3	0.0				
Lane LOS	മ	∢					
Approach Delay (s/veh)	10.9	4.3	0.0				
Approach LOS	Ω						
Intersection Summary							
Average Delay			7.1				
Intersection Capacity Utilization	c		31.6%	<u> </u>	CU Level of Service	Service	٩
V							

Proposed Residential Development 20 Cairns Crescent, Huntsville Synchro 'Trans-Plan



Level of Service Definitions

## LEVEL OF SERVICE ANALYSIS AT SIGNALIZED INTERSECTIONS

To assist in clarifying the arithmetic analysis associated with traffic engineering, it is often useful to refer to "Level of Service". The term Level of Service implies a qualitative measure of traffic flow at an intersection. It is dependent upon vehicle delay and vehicle queue lengths at the approaches. Specifically, Level of Service criteria are stated in terms of the average stopped delay per vehicle for a 15-minute analysis period. The following table describes the characteristics of each level:

Level of Service	<u>Features</u>	Stopped Delay per Vehicle (sec)
A	At this level of service, almost no signal phase is fully utilized by traffic. Very seldom does a vehicle wait longer than one red indication. The approach appears open, turning movements are easily made and drivers have freedom of operation.	<u>(3€€7</u> ≤ 5.0
В	At this level, an occasional signal phase is fully utilized and many phases approach full use. Many drivers begin to feel somewhat restricted within platoons of vehicles approaching the intersection.	$> 5.0 \text{ and} \le 15.0$
С	At this level, the operation is stable though with more frequent fully utilized signal phases. Drivers feel more restricted and occasionally may have to wait more than one red signal indication, and queues may develop behind turning vehicles. This level is normally employed in urban intersection design.	> 15.0 and < 25.0
D	At this level, the motorist experiences increasing restriction and instability of flow. There are substantial delays to approaching vehicles during short peaks within the peak period, but there are enough cycles with lower demand to permit occasional clearance of developing queues and prevent excessive backups.	> 25.0 and <u>&lt;</u> 40.0
Е	At this level, capacity is reached. There are long queues of vehicles waiting upstream of the intersection and delays to vehicles may extend to several signal cycles.	$> 40.0 \text{ and } \leq 60.0$
F	At this level, saturation occurs, with vehicle demand exceeding the available capacity.	> 60.0

## LEVEL OF SERVICE ANALYSIS AT UNSIGNALIZED INTERSECTIONS<sup>(1)</sup>

The term "level of service" implies a qualitative measure of traffic flow at an intersection. It is dependent upon the vehicle delay and vehicle queue lengths at approaches. The level of service at unsignalized intersections is often related to the delay accumulated by flows on the minor streets, caused by all other conflicting movements. The following table describes the characteristics of each level.

Level of Service	Features
A	Little or no traffic delay occurs. Approaches appear open, turning movements are easily made, and drivers have freedom of operation.
В	Short traffic delays occur. Many drivers begin to feel somewhat restricted in terms of freedom of operation.
C	Average traffic delays occur. Operations are generally stable, but drivers emerging from the minor street may experience difficulty in completing their movement. This may occasionally impact on the stability of flow on the major street.
D	Long traffic delays occur. Motorists emerging from the minor street experience significant restriction and frustration. Drivers on the major street will experience congestion and delay as drivers emerging from the minor street interfere with the major through movements.
Е	Very long traffic delays occur. Operations approach the capacity of the intersection.
F	Saturation occurs, with vehicle demand exceeding the available capacity. Very long traffic delays occur.

<sup>(1)</sup> Highway Capacity Manual - Special Report No. 209, Transportation Research Board, 1985.



## **APPENDIX G**

Town of Huntsville Community Planning Permit By-Law CPPA/20/2025/HTE, Excerpts



## **Town of Huntsville Staff Report**

Meeting Date: July 16, 2025 To: Planning Council

**Report Number:** DEV-2025-75 **Confidential:** No

Author(s): Kirstin Maxwell, Director of Development Services

**Subject:** OPA#8 and CPPA/20/2025/HTE - Housing Action Plan Implementation

## **Report Highlights**

Staff recommendation to Planning Council respecting Official Plan Amendment #8 (OPA#8) and Community Planning Permit By-law Amendment CPPA/20/2025/HTE.

#### Recommendation

### **OPA #8**

**Be It Resolved That:** Amendment #8 to the Town of Huntsville Official Plan, as outlined in Attachment #1 to Report DEV-2025-75, be ADOPTED and forwarded to the District of Muskoka for approval.

#### CPPA/20/2025/HTE

**Be It Resolved That:** Planning Council APPROVE Community Planning Permit By-law Amendment CPPA/20/2025/HTE, the purpose and effect of which is to implement policy changes for the Housing Action Plan.

## **Background**

On March 26, 2025, staff provided an overview of potential changes to both the Official Plan (OP) and Community Planning Permit By-law (CPPBL) to facilitate the development of more affordable and rental housing (Report DEV-2025-34).

Draft OP policies and CPPBL amendments were provided to Planning Council for consideration on May 16th (Report DEV-2025-56), and to receive direction to proceed to a public meeting on the proposed changes.

#### Discussion

#### Official Plan Amendment #8:

The suggested amendments to the Official Plan would apply to lands within the Regional Commercial and Business Employment designations within the Huntsville Urban Settlement Area and the Community Business designation in the Port Sydney Community Area.

Bill 97 changed the definition of "area of employment" to exclude institutional and commercial uses not associated with primary industrial uses. It further narrowed the uses included to warehousing and manufacturing uses. In Huntsville, the majority of our employment areas, in consideration of these new clarifications, would be considered commercial based and not industrial. Contemplating the inclusion of residential uses in these locations, it is suitable if they are clearly accessory to an employment use, and any compatibility concerns are appropriately mitigated. The proposed OPA has been drafted with this in mind. Accessory residential uses would be permitted on the 2nd floor or to the rear of a building, with it being clearly demonstrated how the two uses would remain compatible within specific employment designations. With the framework in place for more mixed use structures, it is anticipated that rental units would be the primary residential use in these types of developments.

Amendments have also been proposed to the Urban Residential Designation within the Huntsville Urban Settlement Area. According to the HOP, Huntsville's Urban Settlement Area is to be the focus of year-round residential and employment growth and accommodate most forms of development (C3.1.2). The character of this area is to be protected by ensuring permitted uses and densities result in compact development designed to respect and incorporate, where feasible, the physical, environmental, and cultural qualities that define Huntsville's Urban Area. (C3.2.7). Additionally, where new development occurs adjacent to existing development, it is to be designed in a manner that reflects existing built form, including such matters as height, building mass and character.

The Urban Residential designation encourages intensification, particularly within mapped intensification corridors (C3.2.27) and a range of housing types to achieve this goal (C3.3.1). The Plan also identifies a number of intensification policies, such as promoting a range of housing choices, increasing densities, and achieving an appropriate transition of built form to adjacent areas (C3.2.30, C3.2.31). Policies have been added to the Urban Residential designation to require a percentage of new builds to accommodate secondary units within the dwellings, and make it easier to convert a basement or upper storey of a new dwelling to two units in the future. While we understand that this could include an additional cost to the homeowner upfront, the future cost of the retrofit would be substantially less. It should be noted that the Ontario Building Code has also been updated to simplify requirements, with the removal of the fire separation and the inclusion of a smoke separation instead. As our demographics are changing, multi-family cohabitation is becoming more prevalent, and these forms of development provides opportunities for rental income to new homeowners.

The HOP contains policies related to Smart Value (affordable and attainable) Housing (D2). Affordability continues to be the most significant hurdle when it comes to housing, both from a developer and a purchaser's perspective. Without the policy framework in place, staff cannot push or require the development community to accommodate Smart Value Housing. There are many forms this type of development could take, including head lease arrangements, workforce housing options, and subsidized units. In discussions with the developers who attend the Developers Roundtable meetings, they universally stated that if there are requirements to include affordable housing within their developments it would force all new builds to stop. Staff have therefore included a policy for consideration of a target percentage of Smart Value units in all new development. Policies have also been amended to ensure that rental conversions must be evaluated against a stricter policy test. Combined with incentive programs and opportunities for community benefits when increasing height or density, staff are hopeful that this will provide opportunity for more attainable residential units.

#### CPPA/20/2025/HTE

- The Regional Commercial, and Employment Precincts have been revised to incorporate the additional permitted accessory residential uses as discussed above.
- The provisions regarding secondary residential dwelling units (SRDUs) have been updated to permit up to two (2) units within an accessory structure in the Rural areas, with a slightly increased setback from neighbouring lot lines to maintain room for appropriate buffers.
- Parking provisions have been amended to provide a reduction in parking for multiple residential rental developments to 1 space/dwelling unit, and for affordable residential development to 0.75 spaces/dwelling unit. This reduction would be acknowledged through a development agreement, noting that there would be a requirement to pay for cash-in-lieu of parking for the reduced units if the building converted to condominium or was no longer affordable after a specific number of years.
- Added a 4plex as a permitted uses within the Urban Residential Low precinct, with a further notation that any changes to height, setbacks or lot coverage would require a Class 3 CPP.
- Added a 4plex as a permitted use within the Community Mixed Use Precinct
- Removed Short-Term Rental Accommodation as a permitted accessory use in the Urban Residential Low precinct.

These changes will permit additional multiple residential uses, with the aim to increase the rental and affordable rental developments.

### **District of Muskoka Official Plan**

The lands are designated "Urban Centre" and "Community Centre" in the District of Muskoka Official Plan. District comments are forthcoming and will be provided to Planning Council upon receipt.

## 2024 Provincial Planning Statement

The 2024 Provincial Planning Statement (PPS) applies to this proposal. The PPS contains policies with respect to Housing which indicate that planning authorities shall provide for an appropriate range and mix of housing options and densities to meet projected needs of current and future residents. Settlement Areas shall be the focus of growth and their vitality and regeneration shall be promoted. Land use patterns within settlement areas should be based on densities and a mix of land uses which efficiently use land and resources; optimize existing and planned infrastructure and public service facilities; support active transportation; are transit-supportive; and are freight-supportive. Planning authorities shall support general intensification and redevelopment to support the achievement of complete communities, implement minimum targets for intensification and redevelopment within built-up areas, and establish density targets for designated growth areas (2.2.1, 2.3.1). The PPS also contains policies respecting residential intensification and complete communities. In order to achieve complete communities, a range and mix of land uses, housing options, transportation options, employment, public service facilities and other institutional uses, recreation, parks and open space, and other uses to meet long-term needs should be accommodated where appropriate (2.1.6).

Further, the PPS contains policies with respect to Employment which indicate that planning authorities shall promote economic development and competitiveness by providing for an appropriate mix and range of employment, institutional, and broader mixed uses to meet long-term needs; providing opportunities for a diversified economic base; encouraging intensification of employment uses and compatible, compact, mixed-use development to support the achievement of complete communities; and address land use compatibility adjacent to employment areas by providing an appropriate transition to sensitive land uses (2.8.1.1).

## **Summary**

The proposed OPA and CPPA conform to the intent of the Official Plan and are consistent with the Provincial Planning Statement. As such, staff are recommending approval of Official Plan Amendment #8 and Community Planning Permit By-law Amendment Application CPPA/20/2025/HTE.

## **Options**

Council could refuse or amend the OPA and CPPA however that is not recommended as the applications as proposed conform to the intent of the Official Plan and are consistent with the Provincial Planning Statement.

## Relevant Policies / Legislation / Resolutions

Bill 97: Helping Homebuyers, Protecting Tenants Act, 2023

Bill 109: More Homes for Everyone Act, 2022

Bill 23: More Homes Built Faster Act, 2022

Bill 3: Strong Mayors, Building Homes Act, 2022

Planning Act, RSO 1990

Municipal Act, SO 2001

Provincial Planning Statement, 2024

District of Muskoka Official Plan

Town of Huntsville Official Plan

Huntsville Community Planning Permit By-law 2022-97, as amended

Housing Needs Assessment

## **Council Strategic Direction**

- Balanced Growth-1.1: Review planning legislation and policies to support flexibility and optimize land use, including in rural areas, to address different community needs.
- Balanced Growth-2.1: Develop a Housing Action Plan to identify solutions to meet the Town's market rental and ownership needs as identified through a Needs Assessment to be conducted in conjunction with the District of Muskoka.
- Balanced Growth-2.2: Collaborate with the District, other levels of government and community partners to create attainable housing options and effectively communicate their programs to Huntsville residents.
- Protected Natural Environment-1.1: Continue to apply best practices in maintaining our natural heritage features.

### **Attachments**

Attachment #1: Draft HAP OPA By-law
Attachment #2: Draft HAP CPP By-law
Attachment #3: Public Comments

Respectfully Submitted:	Kirstin Maxwell, Director of Development Services
•	•
Manager Approval (if required):	
,	



## **APPENDIX H**

Parking Demand Survey Results at Proxy Sites

### **Parking Demand**

Site: Laketree Residence, 210 Highway 60, Huntsville

Date: Friday, July 4, 2025 Time frame: 13:00 to 24:00

Supply: 128 (122 standard, 6 accessible)

Spot count: 81 vehicles at 23:15

	Main access		Side	Ī	
Start Time	In	Out	In	Out	Demand
13:00	3	1	1	1	
13:15	0	3	2	0	
13:30	2	2	1	0	
13:45	4	2	2	1	
14:00	4	4	2	1	
14:15	3	6	0	3	
14:30	1	0	2	2	
14:45	2	4	4	0	
15:00	0	2	2	1	
15:15	0	2	2	0	
15:30	1	4	1	1	
15:45	1	2	1	0	
16:00	2	1	7	1	
16:15	3	3	3	2	
16:30	2	4	4	1	
16:45	2	3	1	1	
17:00	1	3	3	0	
17:15	1	3	1	0	
17:30	2	2	2	0	
17:45	1	2	3	0	
18:00	1	2	2	0	
18:15	1	0	3	1	
18:30	3	3	2	1	
18:45	0	3	3	0	
19:00	1	2	1	0	
19:15	2	1	0	0	
19:30	1	4	0	1	
19:45	3	3	0	1	
20:00	2	0	3	0	
20:15	3	0	0	0	
20:30	0	2	2	0	
20:45	0	0	3	1	
21:00	2	3	1	0	
21:15	0	1	3	0	
21:30	2	1	1	0	
21:45	2	1	1	0	
22:00	3	0	0	0	
22:15 22:30	1 1	0	1 1	0	
22:45	1	0	0	0	
-	0	0	1	0	81
23:00 23:15	1	1	1	1	81
23:30	0	0	0	1	
23:45	1	1	0	0	

at end of interval starting at 23:00, spot count was 80 at 23:15

## **Parking Demand**

Site: Hunters Bay Apartments, 4 Yonge Street North, Huntsville

Date: Friday, July 4, 2025 Time frame: 13:00 to 24:00

Supply: 38 (34 standard, 2 accessible, 2 visitors)

Spot count: 20 vehicles at 24:00

	Main	İ	
Start Time	ln	Out	Demand
13:00	0	1	
13:15	0	0	
13:30	2	2	
13:45	1	2	
14:00	0	1	
14:15	2	2	
14:30	0	1	
14:45	1	0	
15:00	1	0	
15:15	5	1	
15:30	1	3	
15:45	1	1	
16:00	1	0	
16:15	1	2	
16:30	1	1	
16:45	2	1	
17:00	0	0	
17:15	3	1	
17:30	1	2	
17:45	1	0	
18:00	3	1	
18:15	1	1	
18:30	2	0	
18:45	0	1	
19:00	1	0	
19:15	0	0	
19:30	0	1	
19:45	0	1	
20:00	0	0	
20:15	1	1	
20:30	1	0	
20:45	0	0	
21:00	2	1	
21:15	1	1	
21:30	3	2	
21:45	0	0	
22:00	0	0	
22:15	2	1	
22:30	0	0	
22:45	0	1	
23:00	1	0	
23:15	0	1	
23:30	1	0	
23:45	0	0	20

at end of interval which began at 23:45, spot count was 20 at 24:00

Table 11 – 23 & 25 Mary Street, Huntsville - Parking Utilization Survey

	Parking Demand								
Time	Resident		Visitor	Total					
-	Friday, December 13 <sup>th</sup> , 2024								
18:00	3	1	1	5					
18:30	4	1	1	6					
19:00	3	1	1	5					
19:30	3	1	1	5					
20:00	3	1	1	5					
20:30	2	1	1	4					
21:00	3	1	1	5					
21:30	3	1	1	5					
	Saturo	lay, December 14 <sup>th</sup> , 2	2024						
15:00	3	1	0	4					
15:30	3	1	0	4					
16:00	3	1	0	4					
16:30	3	1	1	5					
17:00	3	1	1	5					
17:30	4	0	1	5					
18:00	4	0	1	5					
18:30	4	0	2	6					
19:00	4	1	2	7					
19:30	3	1	2	6					
20:00			2	7					
20:30	20:30 4		2	7					
21:00	21:00 4		2	7					
21:30	4	1	2	7					
	r	lay, December 17 <sup>th</sup> , 2	2024						
22:00 to 00:00	4	1	1	7					
Parking Supply	13 spaces	1 space	4 spaces	18 spaces					
Max Demand	4	1	2	7					
Max Utilization	31%	100%	50%	39%					
Demand per Unit	0.33	0.08	0.17	0.58					
Size: 12 units									

As illustrated the maximum residential parking demand is 0.43 spaces / unit (resident + accessible). The maximum visitor parking demand is 0.17 spaces / unit.

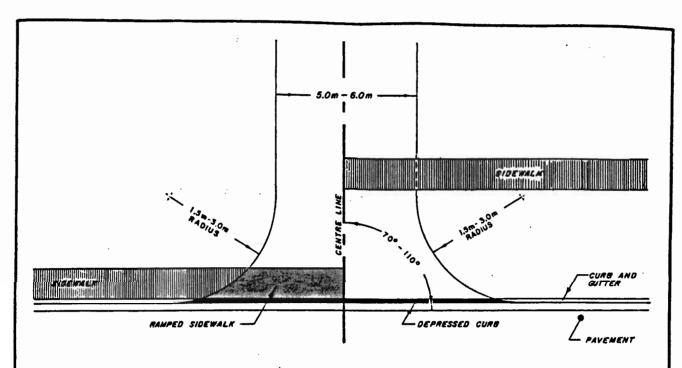
The maximum total parking demand is 0.58 spaces / unit.



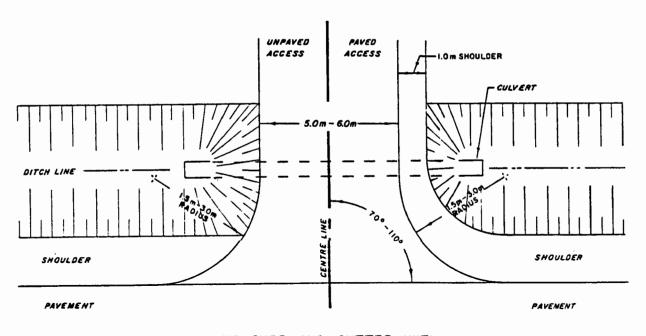


## **APPENDIX I**

District of Muskoka Access Design Criteria, Excerpts



EXISTING CURB AND GUTTER



NO CURB AND GUTTER WITH OPEN DITCH

The District Municipality of Muskoka

Policy And Procedures For Access Onto District Roads

NON-COMMERCIAL ACCESS REQUIREMENTS

FIG.



# APPENDIX J

Sightline Survey Results

#### SIGHT DISTANCE REVIEW STUDY

**Location:** Proposed access on Cairns Road, Huntsville **Number of Lanes** 1 in both directions

 Date:
 Friday, July 11, 2025
 Posted Speed Limit:
 50 km/h

 Time:
 1:00pm
 Design Speed:
 60 km/h

Weather: Sunny, dry, 26 degrees.

Surveyors: Trans-Plan

	Proposed Access on Cairns Crescent, 39m east of 26 Cairns Crescent Property Line										
	4.5m Setback From Threshold										
	Looking Left (\	Nest) for Ri	Looking Right (East) for Left Turn								
Available Sight Distance	Reason	Criteria	Required Sight .Distance (m)	Req. Met? (Y / N)	Available Sight Distance	Reason	Criteria	Required Sight .Distance (m)	Req. Met? (Y / N)		
		SSD	85	Υ			SSD	85	N*		
290m	road curve	ISD for R turn	110	Υ	50m	intersection	ISD for L turn	130	N*		



Tall weeds on-site obscurred the view, but with the weeds gone the view would be clear to beyond the minimum distances, as shown on the photo below taken from a height of 2m:

Tall weeds on-site obscurred the view, but with the weeds gone the view would be clear to the intersection, as shown on the photo below taken from a height of 2m:

\*The intersection is nearer than the required sight distance



Note: Referenced Table 9.9.4: ISD - Left Turn from Stop, and Table 9.9.6: ISD - Right Turn from Stop,

from TAC 2017 for sight distance requirements

Driver Eye Height: 1.08m Distant Object Heights: 0.60m