



NW Corner of Rebstock Road and Ridge Road South Residential Development

04 May 2021

→ The Power of Commitment



May 4, 2021

Reference No: 11213209

Town of Fort Erie
1 Municipal Centre Drive
Fort Erie Ontario
L2A 2S6

Attention: Jeremy Korevaar, C.E.T.

**Re: Transportation Brief
 Proposed Residential Development
 NW Corner of Rebstock Road and Ridge Road South
 Crystal Beach, Ontario**

1. **Introduction**

GHD is pleased to provide the following Transportation Brief for the proposed residential development located on Rebstock Road within the Crystal Beach urban area.

The objective of the study is to:

- Provide a summary of the transportation infrastructure in the area;
- Estimate the entering and exiting trip generation from the proposed development;
- Provide a summary of the capacity analysis of the adjacent intersections of Rebstock Road with Ridgeway Road and Ridge Road South.

2. **Study Area**

The subject site is located on the northwest corner of the intersection of Rebstock Road and Ridge Road South.

The site location is shown in Figure 1.



Figure 1 Site Location

3. Existing Road Network

3.1 Existing Road Network

Rebstock Road is an east-west collector road that extends from Cherry Hill Boulevard South in the west to Prospect Point Road South to the east. The road has an existing two-lane urban cross-section and an assumed speed limit of 50 km/h with no on-street parking restrictions. The intersection with Ridgeway Road is signalized with no auxiliary turning lanes.

Ridgeway Road South is a north-south collector road that extends from Terrace Lane in the south to Farr Avenue to the north. North of Farr Avenue it is referred to as Gorham Road and is under the jurisdiction of Niagara Region. Within the vicinity of the site, this road has an existing two-lane urban cross-section and a posted speed limit of 40 km/h. The intersection with Rebstock Road is signalized with no auxiliary turning lanes.

Ridge Road South is a north-south collector road that extends from Crystal Beach Drive North in the south to Bowen Road in the north. Within the vicinity of the site, this road has an existing two-lane rural cross-section and an assumed speed limit of 50 km/h.

3.2 Pedestrian and Cycling Routes

Pedestrian sidewalks are currently provided on the west side of Ridge Road South, the north side of Rebstock Road and both sides of Ridgeway Drive.

There are currently no on-street bicycle facilities adjacent to the site.

3.3 Transit Services

Fort Erie Transit operates Route #760 West which travels westbound on Rebstock Road from Ridge Road South.

The stop is located approximately 70 metres from the access to the proposed development.

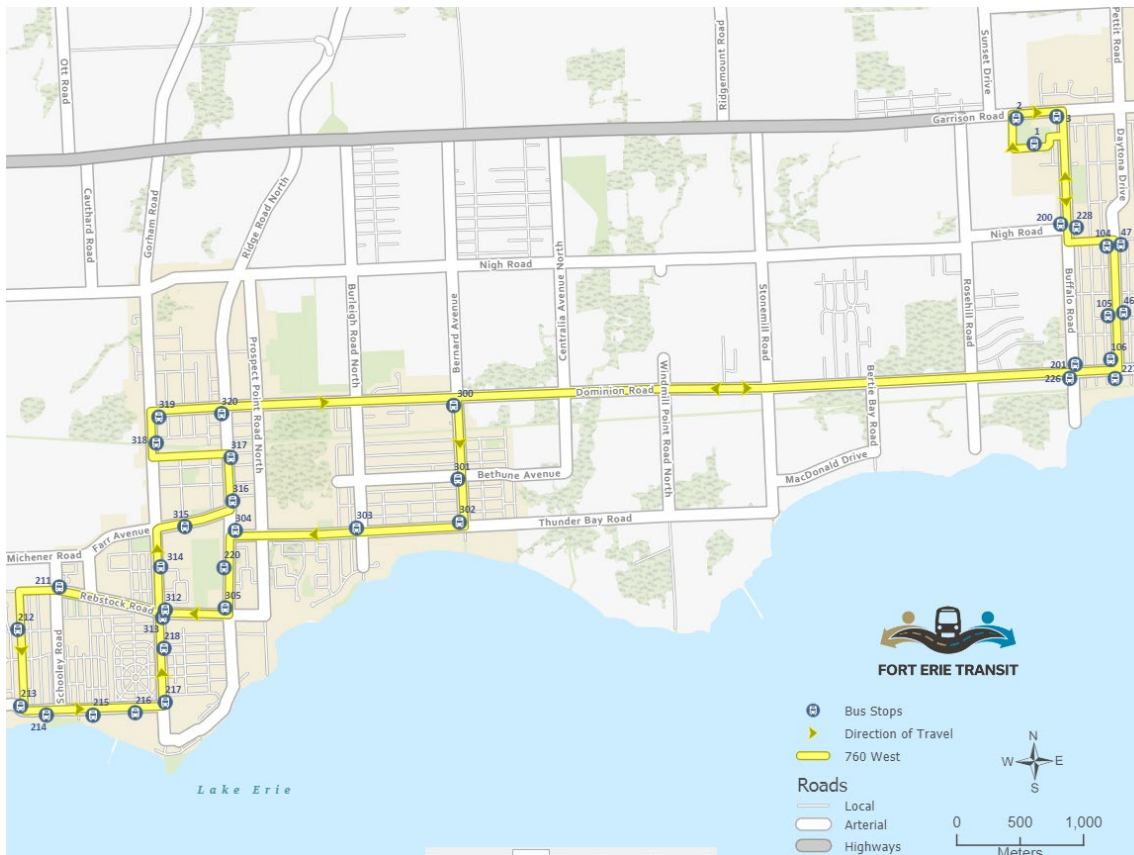


Figure 2 Fort Erie Transit Map

Route #760 currently operates weekdays with a one-hour headways from 6:14 a.m. to 8:14 p.m.

4. Existing Traffic Data

The existing turning movement data for the weekday AM and PM peak periods at each of the study intersections was collected during the month of April 2021. A figure summarizing both AM and PM peak hour volumes are provided in Figure 3.

Due to the traffic surveys being conducted during the current province wide shut down due to the ongoing Covid-19 pandemic, GHD factored the traffic data by increasing the turning movement volumes by 40% during the a.m. and p.m. peak hours. A 40% factor is a conservative estimate of the traffic volume reduction experienced throughout the province and has been confirmed at locations where GHD has conducted recent traffic counts and completed a comparison to historic counts undertaken before the shutdown.

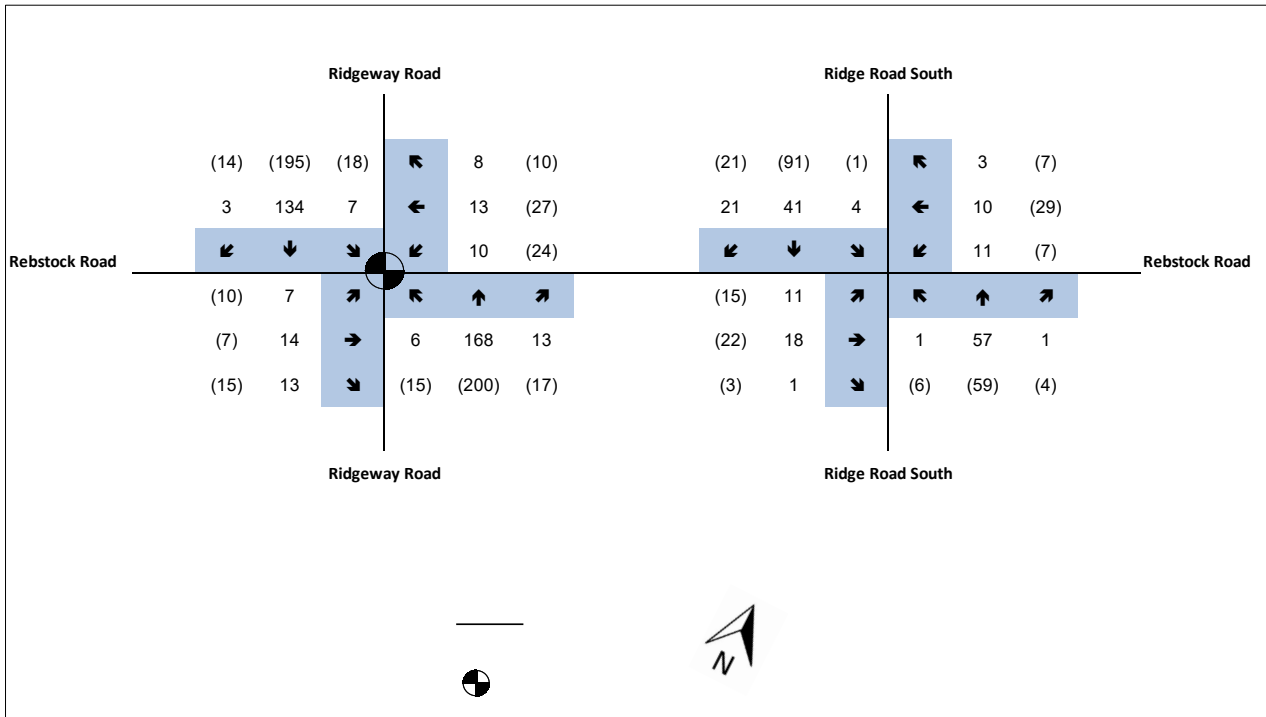


Figure 3 Existing 2021 Traffic Volumes

5. Future Background Traffic

5.1 Study Horizon Year

For the purpose of traffic analysis, a five-year horizon from the date of the report was selected resulting in a 2026 future planning horizon.

5.2 Background Traffic Growth

GHD used a 2% has been applied to all through and turning movement at each study intersections to account for general corridor growth in the area. The growth has been applied to both future study horizon years.

5.3 Future Background Traffic Volumes

Future background traffic volumes were derived by adding the forecasted corridor growth volumes to the existing traffic volumes. The background traffic volume at the 2026 planning horizon during the weekday AM and PM peak hours are provided below in **Figures 4**.

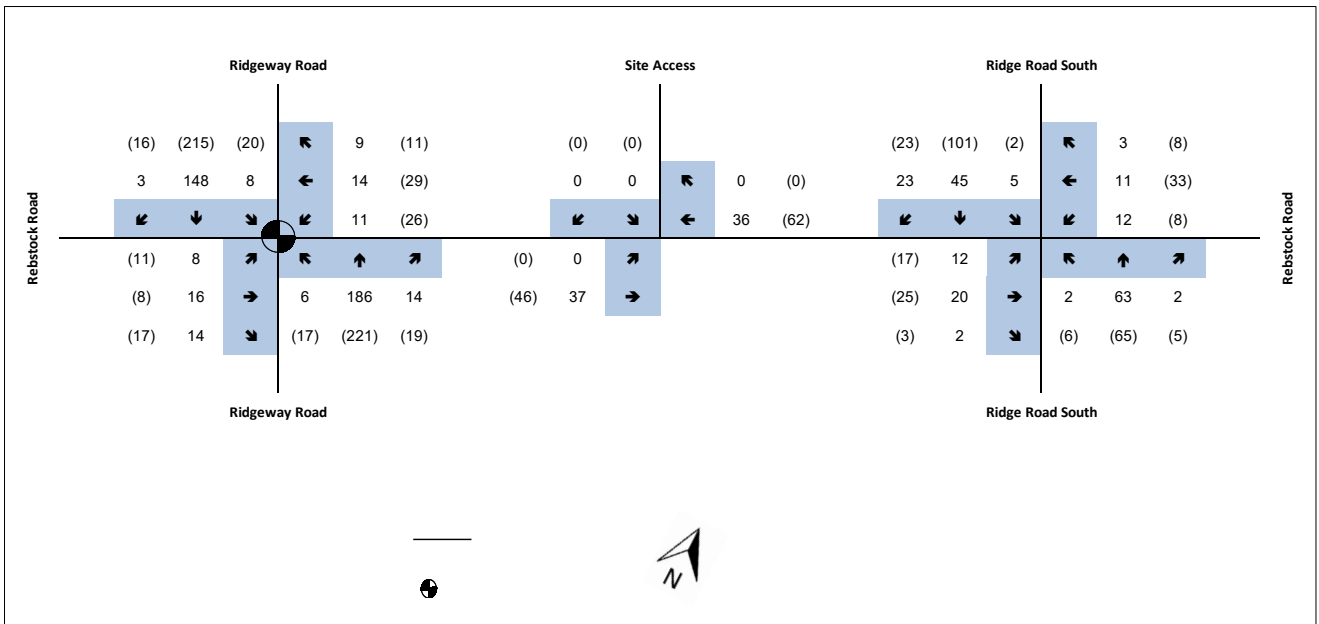


Figure 4 2026 Background Traffic Volumes

6. Proposed Development

The proposed site plan dated March 26, 2021 consists of 168 Back-to-back stacked townhouse apartment units and 197 surface parking spaces.

6.1 Modal Split

No transit reduction was applied to the estimated site trips in the study analysis.

6.2 Site Trip Generation

Site traffic generated by the subject site for the weekday a.m. and p.m. peak hours was estimated by applying the trip rates in the Trip Generation, 10th Edition Manual published by the Institute of Transportation Engineers (ITE). Land Use Code 221 (Multifamily Housing Mid-Rise) was used.

GHD adopted the estimated site trips based on either the average rate or the fitted curve equation, depending on which approach resulted in a higher number of trips.

Table 1 Site Trip Generation

Land Use Code	Units	Parameters	Peak Hour Trip Generation					
			Weekday AM			Weekday PM		
			In	Out	Total	In	Out	Total
Multi-family Mid-Rise (LUC 221)	168	Trip Rate	0.095	0.262	0.357	0.268	0.172	0.440
		Trip Ratio	25%	75%	-	63%	37%	-
		Gross Trips	16	44	60	45	29	74

The proposed development is expected to generate a total of 60 new two-way vehicle trips during the AM peak hour consisting of 16 inbound and 44 outbound trips. During the PM peak hour, it is expected to generate 74 new two-way vehicle trips consisting of 45 inbound and 29 outbound trips.

6.3 Site Trip Distribution and Assignment

The distribution of site traffic between the subject site through the study area was based on a review of existing traffic distribution along Rebstock Road.

Upon determining origin and destination points throughout the study area for all inbound and outbound trips, trips were assigned to individual turning movements at the study area intersections based on route choice assignment with consideration for anticipated travel times. **Table 2** below summarizes the site trips distribution within the study area road network.

Table 2 Site Distribution

Direction	A.M. Peak Hour Inbound (Outbound)	P.M. Peak Hour Inbound (Outbound)
To/From the East	50% (50%)	57% (43%)
To/From the West	50% (50%)	43% (57%)

The assignment of site trips to the site driveway is illustrated in **Figure 5**.

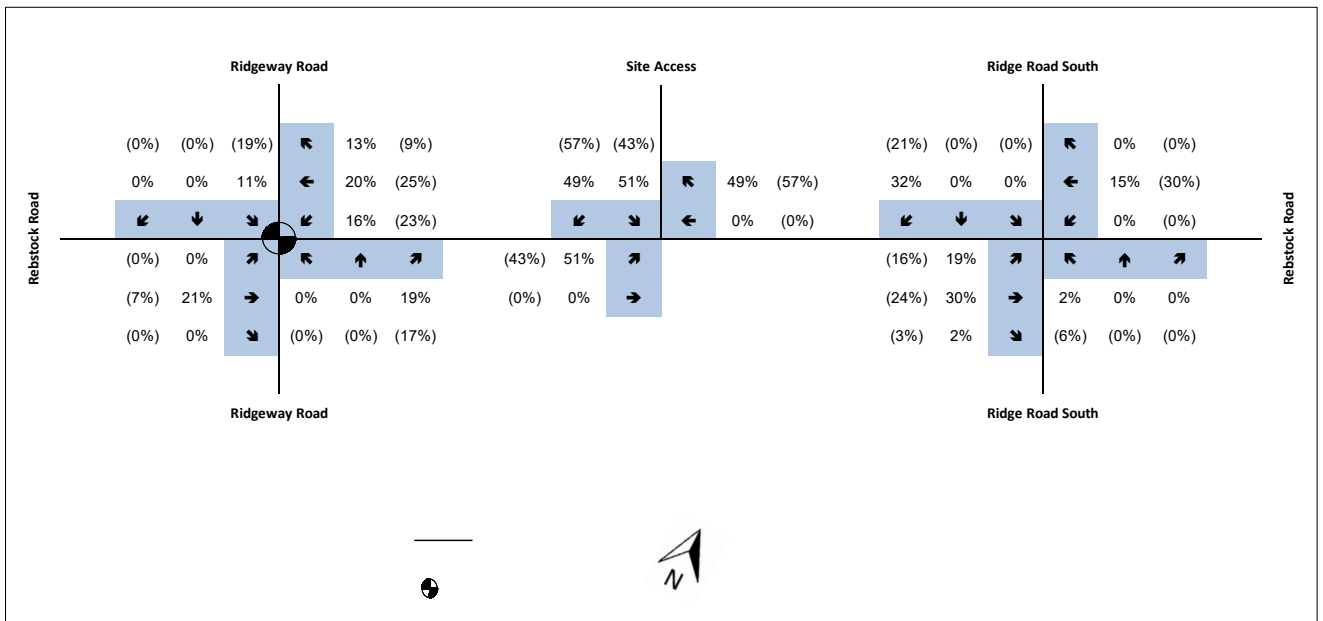


Figure 5 Site Traffic

7. Future total traffic

7.1 Future Total Traffic

The future total traffic conditions in the weekday AM and PM peak study hours for the 2026 planning horizon was derived by combining the future background traffic volumes with the corresponding estimates of site trips generation by the proposed residential development.

Figure 6 summarizes the future total traffic volumes for the 2026 planning horizons, for the weekday AM and PM peak hours.

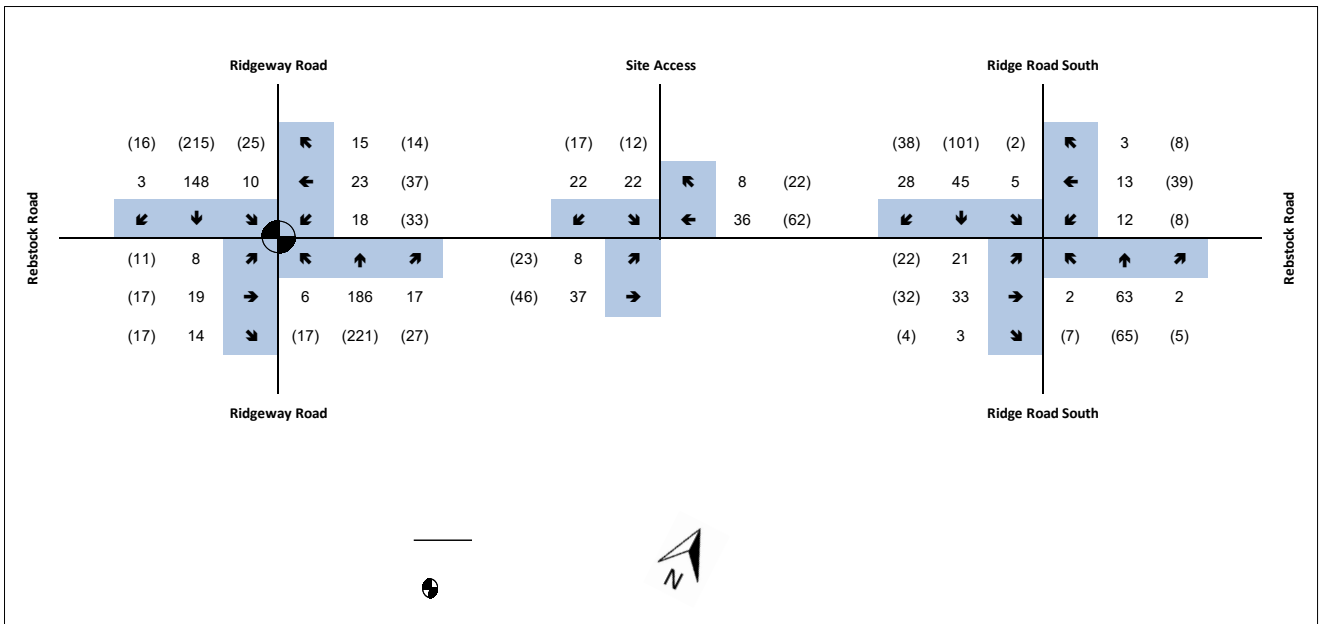


Figure 6 2026 Total Traffic Volumes

8. Intersection Capacity Analysis

The capacity analysis identifies how well the intersections and driveways are operating. The analysis contained within this report utilized the Highway Capacity Manual (HCM) 2000 procedure within the Synchro Version 10 Software package. The reported intersection volume-to-capacity ratios (v/c) are a measure of the saturation volume for each turning movement, while the levels-of-service (LOS) are a measure of the average delay for each turning movement. Queuing characteristics are reported as the predicted 95th percentile queue for each turning movement.

In accordance with the Niagara Region Traffic Impact Study Guidelines, the analysis includes identification of conditions at signalized intersections where:

- Volume/capacity (v/c) ratios for through movements or shared through/turning movements increased to 0.85 or above.
- V/c ratios for exclusive movements increased to 0.90 or above.
- 95th percentile queues for an individual movement are projected to exceed available turning lane storage.

The analysis includes identification of conditions at unsignalized intersections where:

- Level of service if LOS "D" or greater.
- 95th percentile queues for an individual movement are projected to exceed available turning lane storage.

The following tables summarize the HCM 2000 capacity results for the study intersections during the weekday AM and PM hours under existing 2020, future background 2026, future total 2026 traffic conditions.

Signal timing plans for the intersection of Ridgeway Road and Rebstock Road were obtained from the Region for use in the analysis. A copy of the timing plans is included in Appendix B.

8.1 Ridgeway Road and Rebstock Road

Signalized capacity analyses during the weekday AM and PM peak hours are summarized in **Table 3** from detailed Synchro reports attached in for Ridgeway Road and Rebstock Road.

Table 3 Capacity Analyses for Ridgeway Road and Rebstock Road

Traffic Condition	AM Peak Hour		PM Peak Hour	
	Movement v/c (LOS) Delay(sec)	95th Percentile Queue	Movement v/c (LOS) Delay(sec)	95th Percentile Queue
Existing 2021	Overall - 0.16(B) 11 EBTLR = 0.05 (B) 14 WBTLR = 0.05 (B) 14 NBTLR = 0.25 (B) 11 SBTLR = 0.2 (B) 11	EBTLR = 10 m WBTLR = 10 m NBTLR = 25 m SBTLR = 20 m	Overall - 0.23(B) 12 EBTLR = 0.05 (B) 14 WBTLR = 0.11 (B) 15 NBTLR = 0.31 (B) 12 SBTLR = 0.31 (B) 12	EBTLR = 10 m WBTLR = 15 m NBTLR = 30 m SBTLR = 30 m
Future Background 2026	Overall - 0.18(B) 12 EBTLR = 0.05 (B) 14 WBTLR = 0.06 (B) 14 NBTLR = 0.27 (B) 11 SBTLR = 0.21 (B) 11	EBTLR = 10 m WBTLR = 10 m NBTLR = 30 m SBTLR = 25 m	Overall - 0.25(B) 12 EBTLR = 0.05 (B) 14 WBTLR = 0.12 (B) 15 NBTLR = 0.35 (B) 12 SBTLR = 0.35 (B) 12	EBTLR = 10 m WBTLR = 15 m NBTLR = 35 m SBTLR = 35 m
Future Total 2026	Overall - 0.2(B) 12 EBTLR = 0.06 (B) 14 WBTLR = 0.1 (B) 15 NBTLR = 0.28 (B) 11 SBTLR = 0.22 (B) 11	EBTLR = 10 m WBTLR = 10 m NBTLR = 30 m SBTLR = 25 m	Overall - 0.27(B) 13 EBTLR = 0.07 (B) 14 WBTLR = 0.15 (B) 15 NBTLR = 0.36 (B) 12 SBTLR = 0.35 (B) 12	EBTLR = 10 m WBTLR = 15 m NBTLR = 35 m SBTLR = 35 m

Under existing 2021 traffic condition the intersection is operating satisfactorily with substantial reserve capacity, acceptable levels of delay, and negligible queuing.

Under future background 2026 traffic conditions, the intersection is expected to continue to operate satisfactorily and not significant degradation in capacity.

With site traffic added, the intersection is expected to continue operating satisfactorily with significant reserve capacity, acceptable level of delays, and no noticeable increase in queuing.

There are no improvements required at this intersection in response to the subject development.

8.2 Ridge Road South and Rebstock Road

Unsignalized capacity analyses during the weekday AM and PM peak hours are summarized in **Table 4** from detailed Synchro reports attached in for Ridge Road South and Rebstock Road.

Table 4 Capacity Analyses of Ridge Road South and Rebstock Road

Traffic Condition	AM Peak Hour		PM Peak Hour	
	Movement v/c (LOS) Delay(sec)	95th Percentile Queue	Movement v/c (LOS) Delay(sec)	95th Percentile Queue
Existing 2021	EBTLR = 0.01 (A) 3 WBTLR = 0.01 (A) 4 NBTLR = 0.08 (A) 10 SBTLR = 0.08 (A) 10	EBTLR = 5 m WBTLR = 5 m NBTLR = 5 m SBTLR = 5 m	EBTLR = 0.01 (A) 3 WBTLR = 0.01 (A) 1 NBTLR = 0.09 (B) 10 SBTLR = 0.15 (B) 10	EBTLR = 5 m WBTLR = 5 m NBTLR = 5 m SBTLR = 5 m
Future Background 2026	EBTLR = 0.01 (A) 3 WBTLR = 0.01 (A) 4 NBTLR = 0.09 (A) 10 SBTLR = 0.09 (A) 10	EBTLR = 5 m WBTLR = 5 m NBTLR = 5 m SBTLR = 5 m	EBTLR = 0.01 (A) 3 WBTLR = 0.01 (A) 1 NBTLR = 0.11 (B) 10 SBTLR = 0.17 (B) 10	EBTLR = 5 m WBTLR = 5 m NBTLR = 5 m SBTLR = 5 m
Future Total 2026	EBTLR = 0.01 (A) 3 WBTLR = 0.01 (A) 3 NBTLR = 0.09 (B) 10 SBTLR = 0.1 (A) 10	EBTLR = 5 m WBTLR = 5 m NBTLR = 5 m SBTLR = 5 m	EBTLR = 0.01 (A) 3 WBTLR = 0.01 (A) 1 NBTLR = 0.11 (B) 11 SBTLR = 0.19 (B) 11	EBTLR = 5 m WBTLR = 5 m NBTLR = 5 m SBTLR = 5 m

Under existing 2021 traffic conditions, this intersection is currently operating satisfactorily with substantial reserve capacity, acceptable levels of delay, and negligible queuing.

Under both future background and future total traffic conditions in 2026, including the proposed site traffic this intersection is expected to continue to operate satisfactorily with reserve capacity, acceptable level of delays, and negligible queuing.

There are no improvements required at this intersection in response to the subject development.

8.3 Rebstock Road and the Site Access

Unsignalized capacity analyses during the weekday AM and PM peak hours are summarized in **Table 5** from detailed Synchro reports attached in for Rebstock Road and the site access.

Table 5 Capacity Analyses for Rebstock Road and the site access

Traffic Condition	AM Peak Hour		PM Peak Hour	
	Movement v/c (LOS) Delay(sec)	95th Percentile Queue	Movement v/c (LOS) Delay(sec)	95th Percentile Queue
Future Total 2026	EBTL = 0.01 (A) 2 WBTR = 0.03 () 0 SBLR = 0.05 (A) 9	EBTL = 5 m WBTR = 0 m SBLR = 5 m	EBTL = 0.02 (A) 2 WBTR = 0.05 () 0 SBLR = 0.03 (A) 9	EBTL = 5 m WBTR = 0 m SBLR = 5 m

The proposed site access is expected to operate satisfactorily with reserve capacity, acceptable level of delays, and negligible queuing.

9. Parking Assessment

9.1 Existing By-Law Requirement

The proposed residential development consists of 168 back-to-back stacked townhouse apartment units.

Based on our review of the Town's current parking By-law requirements for apartment and block townhouse units, By-law No. 129-90 requires 1.50 parking spaces per dwelling unit as summarized in **Table 6** below.

Table 6 Existing Bylaw Requirement

Units	Town's By-Law Requirement	
	Existing Parking Rate per unit	Required Parking Supply
168	1.5	252

The proposed site plan provides a total parking supply of 195 parking spaces (168 resident and 27 visitor spaces). This equates to a parking ratio of 1.0 resident spaces per unit and 0.16 visitor spaces per unit.

Therefore, the development as proposed does not meet the Town's By-law requirements with a deficit of 57 spaces from the By-law requirement.

9.2 Review of Approved Parking Requirements for Other Developments

The following is a review of the parking requirements at other similar high density stacked back-to-back townhouse developments with similar developmental characteristics to the subject site. Parking data local to the Crystal Beach and Fort Erie area is not available and due to the pandemic and lack of similar type of developments within the Town, GHD is unable to conduct their own parking demand surveys locally. The following sites are within the Region of Durham and are used to aid in determining the parking requirements that would be most appropriate for the proposed subject development. The main objective of the parking review was to determine whether there is justification for reducing the current By-law parking requirement for this type of land use.

9.2.1 2695, 2705 and 2725 Brock Road, City of Pickering

This 'Site' is located on the east side of Brock Road, north of the hydro corridor and west of William Jackson Drive, in the Duffin Heights Neighbourhood. The proposed development consists of a total 334 units.

Based on review of the City of Pickering "Report to Planning & Development Committee" - Report Number: PLN 15-14, dated on July 7, 2014 for Draft Plan of Subdivision Application SP-2013-04, the approved parking rate for stacked back-to-back townhouse is a minimum of 1.0 parking space per unit for residents.

9.2.2 2488 and 2504 Brock Road, City of Pickering

This 'Site' is located on the west side of Brock Road, north of the Concession Road 3, south of Dersan Street, in the Duffin Heights Neighbourhood.

Based on review of the City of Pickering By-law Number: 7633/18, dated on June 25, 2018 for "MU-MD-4" Zone, the parking required and supply rate for stacked back-to-back townhouse is a minimum of 1.0 parking space for residents as indicated in City's By-law No. 7633/18 Section 6.

9.2.3 Block 10 of Plan 40M-2544 Development, Town of Whitby

This 'Site' is located on the east side of Brock Street and north of Rosland Road in the Town of Whitby. The total number of residential units proposed is 509, including: 128 back-to-back stacked townhouse units within 4 blocks (3.5-storeys); and 3 apartment buildings as follows: Building 1 - 8-storeys, 78 units; Building 2 - 10-storeys, 135 units; and, Building 3 - 13-storeys, 168 units.

Based on review of the Town of Whitby Staff Report "Zoning By-Law Amendment Application, Block 10 on Plan 40M-2544" - Report Number: PL 01-21, dated on February 22, 2021 the parking required for stacked back-to-back townhouse is a minimum of 1.0 parking space per unit for residents.

Based on review of the parking rates approved in other municipalities, a minimum parking requirement for stacked townhouses of 1.0 space per unit for resident parking has been accepted by staff and Council.

Therefore, the proposed resident parking ratio of 1 space per unit can be considered sufficient to accommodate the anticipated resident parking demands for the subject site and is consistent with recent trends in reducing the parking supply for this type of land use in other municipalities.

9.3 Supporting Proxy Parking Survey Data

GHD conducted parking demand (or utilization) surveys to record the visitor parking demand at four residential buildings located within Durham Region during the expected peak period to establish the peak visitor parking demand. From our experience, the peak visitor period occurs on Saturday evenings. Therefore, to determine the maximum, we visited the locations every hour between 17:00 and 21:00 on two separate Saturdays to capture the peak visitor demand at each location and day. The data tabulated to document the peak visitor parking ratio per residential unit. An average ratio calculated.

It should be noted that during each survey, pedestrian traffic entering and leaving the site was also observed to confirm the estimated use of transit for the site being surveyed. It was noted that transit use was not observed to be a significant source of site traffic.

9.3.1 Selected parking sites

Given the available locations, the sizes were sufficiently large enough to obtain meaningful parking demand. Other criteria used to select the sites was the accessibility to the parking. That is the residential and visitor must be readily accessible and in these cases this meant surface parking.

Of the reviewed sites, all had surface visitor parking, however only one had surface resident parking. The other sites had underground resident parking which were not accessible to the surveyor. The selected sites are provided in **Table 7**.

Table 7 Parking Survey locations

Surveyed Site locations	Residential Type	Number of visitor parking spaces provided	Number of units
1525, 1535 Diefenbaker Court and 1530, 1540 Pickering Parkway, City of Pickering	condominium buildings	60	273
1600 Charles Street, Town of Whitby	condominium building	35	140
340 Watson Street West, Town of Whitby	condominium building	71	215

Surveyed Site locations	Residential Type	Number of visitor parking spaces provided	Number of units
4 Randall Drive, Town of Ajax	Townhouses	35	143

9.3.2 Parking data summary and analysis

In order to determine the existing peak visitor parking demand, we conducted a parking demand survey at four residential buildings located on Saturday February 6, 2016 and Saturday February 13, 2016 between 5pm and 9pm. We counted the number of occupied visitor parking spaces along with the supply during the survey period. The parking ratio was derived from the ratio of parked vehicles to the total number of units.

The survey results are summarized in **Table 8** and **9**. It is to be noted that the numbers provided in these tables are the maximum demand during the survey period for each condominium apartment location. Aggregated numbers based on the weighted average are also provided.

Table 8 Visitor parking ratio

Location	Number of visitor parking spaces	Number of units	Maximum observed demand ratio Feb 6, 2016	Maximum observed demand ratio Feb 13, 2016
1525, 1535 Diefenbaker Court and 1530, 1540 Pickering Parkway, City of Pickering	60	273	0.059	0.062
1600 Charles Street, Town of Whitby	35	140	0.079	0.086
340 Watson Street West, Town of Whitby	71	215	0.116	0.112
4 Randall Drive, Town of Ajax	35	143	0.126	0.119
Weighted average			0.091	0.091

Based on the parking survey (Table 8), the weighted average visitor parking demand ratios was 0.091 parking spaces per unit for the two surveyed days.

Table 9 Residential parking ratio

Location	Number of residential parking spaces	Number of units	Maximum observed demand ratio Feb 6, 2016	Maximum observed demand ratio Feb 13, 2016
1525, 1535 Diefenbaker Court and 1530, 1540 Pickering Parkway	390	273	0.883	0.810

Table 9 indicates that the maximum resident-occupied parking was 0.883 and 0.810 parking spaces per unit, respectively for the two surveyed days, or 0.846 combined. The resident parking demand is lower than marketing target of selling one space per unit.

9.3.3 Other residential proxy site parking surveys

To provide additional parking survey data, GHD also reviewed parking demand (or utilization) surveys conducted by Dillon Consulting for 840 Rossland Road West Traffic Impact and Parking Study (Updated) Dated July 2019.

Parking survey sites

Dillon Consulting conducted parking surveys at two residential condominium buildings:

- 2 Westney Road North, Ajax (northwest corner of Westney Road and Kingston Road):
 - 156 residential units
 - 249 resident parking spaces (at grade)
 - 32 visitor parking spaces
- 712 Rossland Road East, Whitby (northeast of Rossland Road and Garden Street)
 - 161 residential units
 - 208 resident parking spaces (within parking garage)
 - 35 visitor parking spaces

Parking survey date and period

The parking surveys at both sites were undertaken on the following dates:

- 2 Westney Road North:
 - Thursday, July 4, 2019
 - Friday, July 5, 2019
 - Saturday, July 6, 2019
- 712 Rossland Road East
 - Thursday, July 11, 2019
 - Friday, July 12, 2019
 - Saturday, July 13, 2019

All surveys were undertaken between 6:00 P.M. and 12:00 midnight.

9.3.4 Parking data summary and analysis

Table 10 summarizes the maximum observed parking demand on each survey date and the associated parking rate per unit.

Table 10 Maximum observed parking demand

Date	2 Westney Road North, Ajax		712 Rossland Road East, Whitby	
	Residential parking	Visitor parking	Residential parking	Visitor parking
Thursday, July 11, 2019	131	11	135	10
Friday, July 12, 2019	132	14	135	17
Saturday, July 13, 2019	127	11	127	13
Maximum observed	132	14	135	17

Date	2 Westney Road North, Ajax		712 Rossland Road East, Whitby	
	Residential parking	Visitor parking	Residential parking	Visitor parking
Number of units	156	156	161	161
Parked vehicles per unit	0.85	0.09	0.84	0.11

Table 6 indicates that the maximum resident-occupied parking was 0.85 and 0.84 parking spaces per unit, respectively for the two surveyed sites, or 0.845 combined, which is consistent with the above GHD's parking survey ratios. The maximum visitor-occupied parking was 0.09 and 0.11 parking spaces per unit, respectively for the two surveyed sites, or 0.10 combined.

In summary, the resident parking demand is lower than the proposed resident parking ratio of 1 space per unit and visitor parking ratio of 0.16 spaces per unit.

9.4 GHD parking demand / utilization surveys within the GTA

To support the proposed reduction in both resident and visitor parking supply, GHD has over time undertaken proxy surveys at multiple existing multi-unit residential developments in the Greater Toronto Area (GTA) for the purpose of collecting parking demand data for both residents and visitors. The completed parking surveys allows GHD to support a reduced parking supply for both residents and visitors depending on the type of development proposed and the supporting transportation demand management initiatives recommended for a site.

9.4.1 Parking survey date and period

In general, parking utilization guidelines require surveying on at least two days over two normal weeks, and within time periods that capture the peak parking demand of the site. GHD therefore generally adopted the following schedule when completed parking demand surveys at each of the proxy sites:

- Parking accumulation on two weekdays on two separate weeks, typically 5:30-5:45 a.m., 12:30-12:45 p.m. (noon) and 10:30-10:45 p.m. time intervals to identify the peak resident demand; and
- Parking accumulation on two Fridays and two Saturdays, typically between 8:00 p.m. and 11:00 p.m. at 15-minute intervals to capture the peak visitor demand and verify the peak resident demand.

Surveyors are generally not permitted to undertake parking surveys unless permission has been granted by the property owner. Permission is typically not granted unless the site being surveyed is in fact the subject site of the parking study or traffic impact study. This limits GHD's ability to gather proxy survey data for sites considered comparable in size and type to the subject development. Therefore GHD, as similar to other consulting agencies, generally utilize previously collected proxy survey data from previously undertaken projects when such data is required in support of a Parking Justification Study.

9.4.2 Parking survey sites

The following list provides a sample of surveyed resident and/or visitor parking demand from parking studies and surveys for sites with similar development content that is proposed for this site. These sample proxy sites were chosen, as they displayed a similar surrounding road network (ex, nearby transit facilities, complete pedestrian road network and nearby shopping facilities) to the proposed development. The proxy sites are as follows:

- **The Courtyards on Main – Phase 1, Milton (260 residential units)**
 - Residents: Access not provided

- Visitors: 0.14 spaces per unit
- **3045 Queen Frederica Drive, Mississauga (113 residential units)**
 - Residents: 0.97 spaces per unit
 - Visitors: 0.16 spaces per unit
- **1315 Silver Spear Road, Mississauga (87 residential units)**
 - Residents: 0.95 spaces per unit
 - Visitors: 0.12 spaces per unit
- **41 Antrim Crescent, Scarborough (192 residential units)**
 - Residents: 0.90 spaces per unit
 - Visitors: 0.10 spaces per unit
- **297 Queens Avenue, Oakville (78 residential units)**
 - Residents: 0.86 spaces per unit
 - Visitors: 0.13 spaces per unit
- **2051-2067 Prospect Street, Burlington (120 residential units)**
 - Residents: 0.80 spaces per unit
 - Visitors: 0.11 spaces per unit
- **70 Dixfield Drive, Toronto (229 residential units)**
 - Residents: 0.95 spaces per unit
 - Visitors: 0.13 spaces per unit

9.4.3 Parking data summary

The results of the parking surveys completed at site with similar access to transit indicate that resident parking rates generally fall below 1.00 spaces per unit, with the highest rate being 0.97 spaces per unit and the average rate being 0.91 spaces per unit. This indicates that a proposed resident parking rate of 1 space per unit is typical for this land use based on the results of the proxy surveys.

Likewise, the highest visitor parking rate was recorded at 0.16 spaces per unit and the average rate being 0.13 spaces per unit. The proxy survey results indicate that a proposed visitor parking rate of 0.16 spaces per unit should accommodate the expected visitor parking demand.

10. Travel Demand Management (TDM)

10.1 Objectives

Development of site specific TDM measures for the proposed site has been done in the context that the primary objective is to reduce single occupancy vehicle use, the plan will review opportunities to set realistic targets for increased use of transit, cycling, and walking trips.

10.2 Travel Demand Management

Travel Demand Management (TDM) refers to a variety of strategies to reduce congestion, minimize the number of single-occupant vehicles, encourage non-auto modes of travel, and reduce vehicle dependency to create a sustainable transportation system. TDM strategies have multiple benefits including the following:

- Reduced auto-related emissions to improve air quality;
- Decreased traffic congestion to reduce travel time;
- Increased travel options for businesses and commuters;
- Reduced personal transportation costs and energy consumptions; and
- Support Provincial smart growth objectives.

The combined benefits listed above will assist in creating a more active and livable community through improvements to overall active transportation standards for the local businesses and surrounding community.

10.3 Existing TDM Opportunities

10.3.1 Walking

Sidewalks are currently provided on the north side of Rebstock Road within the study area providing pedestrian connections to the sidewalk on the west side of Ridge Road South and along both sides of Ridgeway Road.

The nearby transit stop located approximately 70 metres to the east at the intersection of Rebstock Road and Ridge Road South is conveniently accessible by pedestrians residing at the subject development through a complete network of pedestrian sidewalks.

10.3.2 Transit

Fort Erie Transit currently operates Route #760 West which travels westbound on Rebstock Road from Ridge Road South with one-hour headways.

10.3.3 Proposed TDM Opportunities

The TDM plan proposes a mix of measures to meet the objectives and targets to reduce vehicular demand and encourage passenger, transit, cycling, and walking. The proposed TDM measures are listed as follows:

10.3.4 Sidewalk Connectivity

The proposed site plan includes conveniently located sidewalks providing direct access to each unit to the existing sidewalks on Rebstock Road including pedestrian crosswalks across the internal drive aisles.

10.3.5 Unbundled Resident Parking

Separate (or unbundle) resident parking to separate the cost of parking from the cost of each residential unit. This will make the hidden cost of driving visible and encourage residents to make more informed active transportation decisions and may create opportunities for the use of more sustainable modes of transportation.

In other municipalities, unbundled parking could support a parking reduction of 10 percent of the required parking supply.

10.3.6 Bicycle Parking

Providing opportunities for residents to travel to/from the development through cycling can encourage cycling and transit as a viable alternative to using an automobile.

A total provision of 20 on-site secure long-term bicycle parking is proposed that will be available for residents.

Short term visitor bicycle spaces are also proposed located throughout the site.

11. Conclusions and Recommendations

The capacity analysis of the future traffic conditions confirms that the proposed development generated traffic can be accommodated by the existing transportation infrastructure during both the weekday AM and PM peak hours without significantly impacting the operation of the study intersections. Although the operational impact of the added site traffic may be noticeable to motorists travelling through the immediate surrounding road network, as expected with a development of this size, it is not expected to contribute to any significant deterioration of overall network's operational performance.

No geometric improvements have been recommended in response to the proposed development.

Based on the above parking assessment and considering other jurisdictions and the parking requirement and supply at other high density stacked back-to-back townhouse developments, the proposed parking rate of 1 space per unit for residents and 0.16 spaces per unit for visitors is considered appropriate for the subject site.

To promote alternative modes of transportation and further improve the capacity within the study area it is recommended that the owner develops and implements the TDM plan measures identified herein.

We trust that we have addressed the pertinent transportation matters for this proposed development and please do not hesitate to contact us for further clarification of any point.

Sincerely,

GHD



William Maria, P. Eng.
Transportation Planning Lead

Appendices

Appendix A

Site Plan Details



1 PROPOSED BIRD'S EYE VIEW



1 SITE PLAN
1 : 400

Appendix B

Existing Traffic counts and Signal Timings



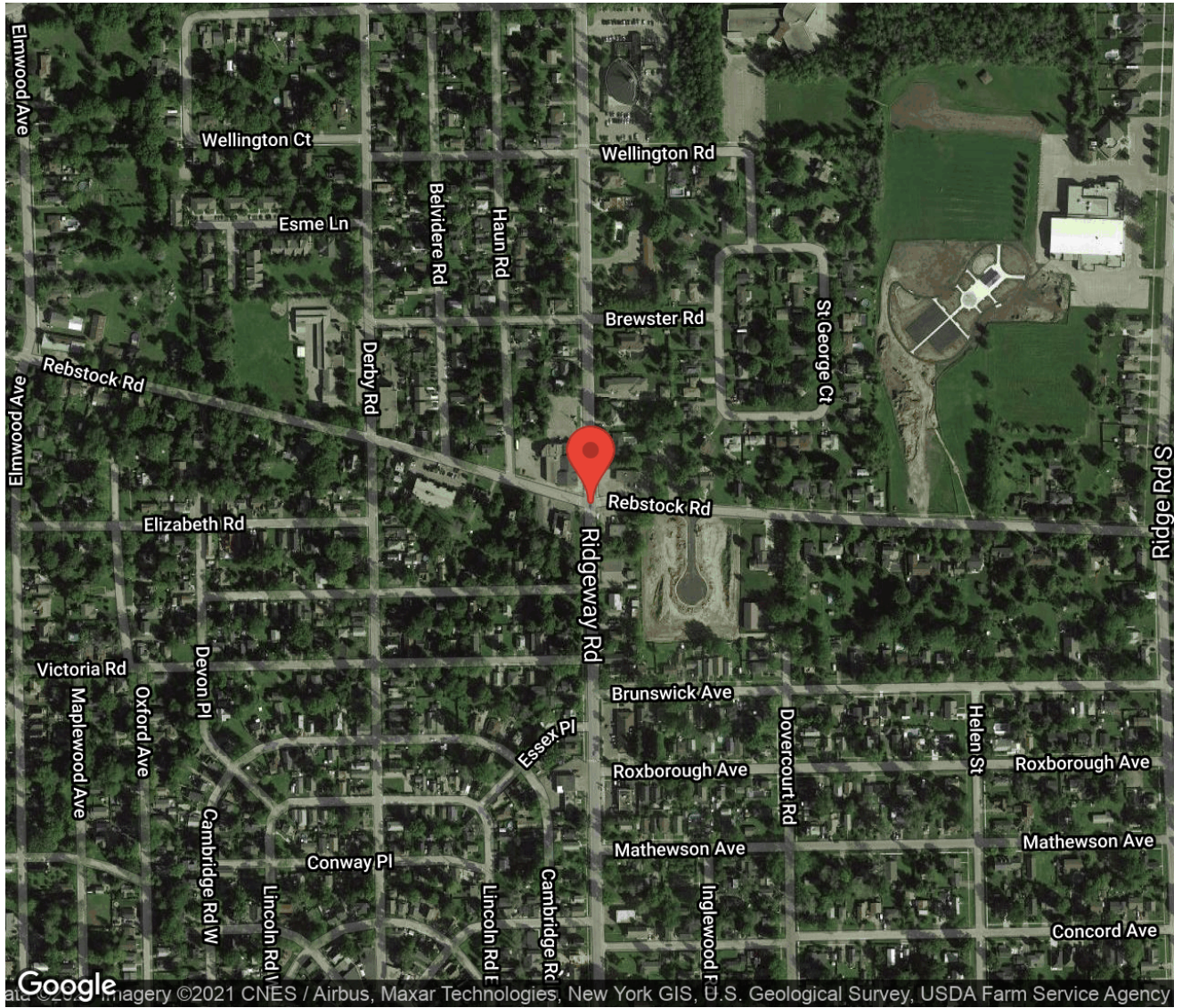
Project #21-057 - GHD

Intersection Count Report

Intersection:	Ridgeway Rd & Rebstock Rd
Municipality:	Fort Erie
Count Date:	Apr 20, 2021
Site Code:	2105700001
Count Categories:	Cars, Trucks, Bicycles, Pedestrians
Count Period:	07:00-09:00, 16:00-18:00
Weather:	Clear

Traffic Count Map

Intersection: Ridgeway Rd & Rebstock Rd
Site Code: 2105700001
Municipality: Fort Erie
Count Date: Apr 20, 2021





Traffic Count Summary

Intersection: Ridgeway Rd & Rebstock Rd
 Site Code: 2105700001
 Municipality: Fort Erie
 Count Date: Apr 20, 2021

Ridgeway Rd - Traffic Summary

Hour	North Approach Totals						South Approach Totals						Total
	Includes Cars, Trucks, Bicycles						Includes Cars, Trucks, Bicycles						
	Left	Thru	Right	U-Turn	Total	Peds	Left	Thru	Right	U-Turn	Total	Peds	
07:00 - 08:00	5	74	5	0	84	1	4	102	5	0	111	0	195
08:00 - 09:00	4	97	2	0	103	3	2	121	9	0	132	1	235
BREAK													
16:00 - 17:00	13	139	10	0	162	3	11	143	12	0	166	0	328
17:00 - 18:00	6	126	7	0	139	0	4	124	8	0	136	0	275
GRAND TOTAL	28	436	24	0	488	7	21	490	34	0	545	1	1033

Traffic Count Summary

Intersection: Ridgeway Rd & Rebstock Rd
 Site Code: 2105700001
 Municipality: Fort Erie
 Count Date: Apr 20, 2021

Rebstock Rd - Traffic Summary

Hour	East Approach Totals						West Approach Totals						Total
	Includes Cars, Trucks, Bicycles						Includes Cars, Trucks, Bicycles						
	Left	Thru	Right	U-Turn	Total	Peds	Left	Thru	Right	U-Turn	Total	Peds	
07:00 - 08:00	5	10	5	0	20	4	5	4	7	0	16	4	36
08:00 - 09:00	8	9	6	0	23	3	5	10	7	0	22	5	45
BREAK													
16:00 - 17:00	17	19	7	0	43	5	7	5	11	0	23	3	66
17:00 - 18:00	13	12	9	0	34	0	6	4	5	0	15	3	49
GRAND TOTAL	43	50	27	0	120	12	23	23	30	0	76	15	196

Traffic Count Data

Intersection: Ridgeway Rd & Rebstock Rd
 Site Code: 2105700001
 Municipality: Fort Erie
 Count Date: Apr 20, 2021

North Approach - Ridgeway Rd

Start Time	Cars			Trucks			Bicycles			Total Peds		
	←	↑	↻	←	↑	↻	←	↑	↻			
	Total			Total			Total			Total		
07:00	2	14	1	0	0	0	1	0	0	0	0	0
07:15	0	18	2	0	3	0	0	0	0	0	0	0
07:30	1	15	1	0	1	0	0	0	0	0	0	0
07:45	1	21	1	0	2	0	0	0	0	0	0	1
08:00	2	23	1	0	2	0	0	0	0	0	0	0
08:15	1	21	0	0	0	0	0	0	0	0	0	2
08:30	1	26	0	0	1	0	0	0	0	0	0	1
08:45	0	24	0	0	0	1	0	0	0	0	0	0
SUBTOTAL	8	162	6	0	176	0	11	0	0	0	0	4

Traffic Count Data

Intersection: Ridgeway Rd & Rebstock Rd
 Site Code: 2105700001
 Municipality: Fort Erie
 Count Date: Apr 20, 2021

East Approach - Rebstock Rd

Start Time	Cars			Trucks			Bicycles			Total Peds			
	←	↑	↻	←	↑	↻	←	↑	↻				
	Total			Total			Total			Total			
07:00	1	1	0	0	1	0	1	0	0	0	1	0	
07:15	0	1	0	0	0	0	0	0	1	0	0	1	
07:30	2	2	0	0	1	0	1	0	1	0	0	2	
07:45	1	2	0	0	0	0	0	0	0	0	0	1	
08:00	2	2	0	0	0	0	0	1	0	0	0	1	
08:15	1	5	0	1	0	0	1	0	0	0	0	2	
08:30	1	0	0	0	0	0	0	0	0	0	0	0	
08:45	2	2	0	0	0	0	0	0	0	0	0	0	
SUBTOTAL	10	15	0	36	1	2	0	3	2	2	0	4	7

Traffic Count Data

Intersection: Ridgeway Rd & Rebstock Rd
 Site Code: 2105700001
 Municipality: Fort Erie
 Count Date: Apr 20, 2021

West Approach - Rebstock Rd

Start Time	Cars			Trucks			Bicycles			Total Peds	
	←	↑	↻	←	↑	↻	←	↑	↻		
	Total			Total			Total			Total	
07:00	1	0	1	0	0	0	0	0	0	0	0
07:15	0	0	1	0	0	0	0	0	0	0	1
07:30	1	1	2	0	0	0	1	0	0	0	1
07:45	2	2	3	0	1	0	0	0	0	0	2
08:00	0	3	2	0	0	0	0	0	0	0	2
08:15	1	1	2	0	0	0	0	0	0	0	2
08:30	2	3	2	0	0	0	0	0	0	0	0
08:45	2	3	1	0	0	0	0	0	0	0	1
SUBTOTAL	9	13	14	0	1	0	0	0	0	0	9



Traffic Count Data

Intersection: Ridgeway Rd & Rebstock Rd
 Site Code: 2105700001
 Municipality: Fort Erie
 Count Date: Apr 20, 2021

West Approach - Rebstock Rd

Start Time	Cars			Trucks			Bicycles			Total Peds				
	←	↑	↻	←	↑	↻	←	↑	↻	←	↑	↻		
	Total			Total			Total			Total				
16:00	2	1	2	0	0	0	0	0	0	0	0	0	0	
16:15	1	2	2	0	0	0	0	0	0	0	0	0	0	
16:30	4	2	4	0	0	0	0	0	0	0	0	0	1	
16:45	0	0	3	0	0	0	0	0	0	0	0	0	2	
17:00	1	1	1	0	0	0	0	0	0	0	0	0	3	
17:15	1	0	1	0	0	2	0	0	0	0	0	0	0	
17:30	3	3	0	0	0	6	0	0	0	0	0	0	0	
17:45	1	0	3	0	0	4	0	0	0	0	0	0	0	
SUBTOTAL	13	9	16	0	0	38	0	0	0	0	0	0	6	
GRAND TOTAL	22	22	30	0	74	1	1	1	0	0	2	0	0	15

Peak Hour Diagram

Specified Period

From: 07:00:00
To: 09:00:00

One Hour Peak

From: 07:45:00
To: 08:45:00




Intersection: Ridgeway Rd & Rebstock Rd
Site Code: 2105700001
Count Date: Apr 20, 2021

Weather conditions: Clear




**** Signalized Intersection ****





Major Road: Ridgeway Rd runs N/S

North Approach




	Out	In	Total
	98	128	226
	5	3	8
	0	0	0
Totals	103	131	234

Ridgeway Rd








	0	0	0	0
	0	5	0	0
	2	91	5	0
Totals	2	96	5	0

East Approach

	Out	In	Total
	20	23	43
	1	1	2
	1	0	1
Totals	22	24	46

Rebstock Rd

				Totals	
0	0	0	0	0	
0	0	0	5	5	
0	1	9	9	10	
0	0	9	9	9	

Peds: 4




Peds: 6






Peds: 4








Peds: 1

Rebstock Rd

Totals			
0	0	0	0
6	6	0	0
9	9	0	0
7	5	1	1

West Approach

	Out	In	Total
	23	15	38
	1	0	1
	0	0	0
Totals	24	15	39


Totals				
4	120	9	0	
	4	117	9	0
	0	3	0	0
	0	0	0	0

Ridgeway Rd

South Approach

Out	In	Total
130	105	235
3	6	9
0	1	1
133	112	245

 - Cars

 - Trucks

 - Bicycles

Comments

Peak Hour Summary

Intersection: Ridgeway Rd & Rebstock Rd
 Site Code: 2105700001
 Count Date: Apr 20, 2021
 Period: 07:00 - 09:00

Peak Hour Data (07:45 - 08:45)

Start Time	North Approach Ridgeway Rd			South Approach Ridgeway Rd			East Approach Rebstock Rd			West Approach Rebstock Rd			Total Vehicles													
	←	↑	↻	←	↑	↻	←	↑	↻	←	↑	↻		Total												
07:45	1	23	1	0	1	25	2	26	4	0	0	32	1	2	1	0	0	1	4	2	3	3	0	2	8	69
08:00	2	25	1	0	0	28	1	27	2	0	0	30	3	2	2	0	1	7	0	3	2	0	2	5	70	
08:15	1	21	0	0	2	22	1	23	1	0	1	25	2	5	2	0	2	9	1	1	2	0	2	4	60	
08:30	1	27	0	0	1	28	0	44	2	0	0	46	1	0	1	0	0	2	2	3	2	0	0	7	83	
Grand Total	5	96	2	0	4	103	4	120	9	0	1	133	7	9	6	0	4	22	5	10	9	0	6	24	282	
Approach %	4.9	93.2	1.9	0	-	-	3	90.2	6.8	0	-	-	31.8	40.9	27.3	0	-	-	20.8	41.7	37.5	0	-	-	-	
Totals %	1.8	34	0.7	0	36.5	1.4	42.6	3.2	0	47.2	2.5	3.2	2.1	0	7.8	0.63	0.83	0.75	0	0.75	0	0	0.75	0.85		
PHF	0.63	0.89	0.5	0	0.92	0.5	0.68	0.56	0	0.72	0.58	0.45	0.75	0	0.61	0.63	0.83	0.75	0	0.75	0	0	0.75	0.85		
Cars	5	91	2	0	98	4	117	9	0	130	5	9	6	0	20	5	9	9	0	23	271					
% Cars	100	94.8	100	0	95.1	100	97.5	100	0	97.7	71.4	100	100	0	90.9	100	90	100	0	95.8	96.1					
Trucks	0	5	0	0	5	0	3	0	0	3	1	0	0	0	1	0	1	0	0	1	10					
% Trucks	0	5.2	0	0	4.9	0	2.5	0	0	2.3	14.3	0	0	0	4.5	0	10	0	0	4.2	3.5					
Bicycles	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0					
% Bicycles	0	0	0	0	0	0	0	0	0	0	14.3	0	0	0	4.5	0	0	0	0	0	0					
Peds					4	-				1	-			4	-				6	-				15		
% Peds					26.7	-		6.7	-	6.7	-		26.7	-	26.7				40	-						

Peak Hour Diagram

Specified Period

From: 16:00:00
To: 18:00:00

One Hour Peak

From: 16:00:00
To: 17:00:00

Intersection: Ridgeway Rd & Rebstock Rd
Site Code: 2105700001
Count Date: Apr 20, 2021

Weather conditions: Clear

**** Signalized Intersection ****

Major Road: Ridgeway Rd runs N/S

North Approach

	Out	In	Total
	159	155	314
	1	2	3
	2	0	2
Totals	162	157	319

Ridgeway Rd

	0	0	2	0
	0	1	0	0
	10	138	11	0
Totals	10	139	13	0

East Approach

	Out	In	Total
	37	28	65
	4	0	4
	2	2	4
Totals	43	30	73

Rebstock Rd

				Totals
	0	0	0	0
	0	0	7	7
	0	0	5	5
	0	0	11	11

Peds: 3

Peds: 3



Peds: 5

Peds: 0

Rebstock Rd

Totals			
0	0	0	0
7	7	0	0
19	16	1	2
17	14	3	0

West Approach

	Out	In	Total
	23	37	60
	0	1	1
	0	2	2
Totals	23	40	63

Totals				
11	11	141	12	0
	0	2	0	0
	0	0	0	0

Ridgeway Rd

South Approach

	Out	In	Total
	164	163	327
	2	4	6
	0	0	0
Totals	166	167	333

- Cars

- Trucks

- Bicycles

Comments

Intersection: Ridgeway Rd & Rebstock Rd
 Site Code: 2105700001
 Count Date: Apr 20, 2021
 Period: 16:00 - 18:00

Peak Hour Summary

Peak Hour Data (16:00 - 17:00)

Start Time	North Approach Ridgeway Rd				South Approach Ridgeway Rd				East Approach Rebstock Rd				West Approach Rebstock Rd				Total Vehicles	
	Peds	Total	Peds	Total	Peds	Total	Peds	Total	Peds	Total	Peds	Total	Peds	Total				
16:00	2	32	3	37	3	41	2	46	5	7	2	14	2	1	2	1	102	
16:15	4	44	3	51	2	30	5	37	5	3	0	8	1	2	2	0	101	
16:30	6	36	2	44	3	48	3	54	6	6	5	17	4	4	2	4	125	
16:45	1	27	2	30	3	24	2	29	1	3	0	4	0	0	0	3	66	
Grand Total	13	139	10	162	11	143	12	166	17	19	7	43	7	5	11	0	394	
Approach %	8	85.8	6.2	-	6.6	86.1	7.2	-	39.5	44.2	16.3	0	-	30.4	21.7	47.8	0	
Totals %	3.3	35.3	2.5	41.1	2.8	36.3	3	42.1	4.3	4.8	1.8	0	10.9	1.8	1.3	2.8	5.8	
PHF	0.54	0.79	0.83	0	0.79	0.92	0.74	0.6	0.77	0.71	0.68	0.35	0	0.63	0.44	0.63	0.69	0
Cars	11	138	10	159	11	141	12	164	14	16	7	37	7	5	11	0	383	
% Cars	84.6	99.3	100	98.1	100	98.6	100	98.8	82.4	84.2	100	86	100	100	100	100	97.2	
Trucks	0	1	0	1	0	2	0	2	3	1	0	4	0	0	0	0	7	
% Trucks	0	0.7	0	0.6	0	1.4	0	1.2	17.6	5.3	0	9.3	0	0	0	0	1.8	
Bicycles	2	0	0	2	0	0	0	0	0	2	0	2	0	0	0	0	4	
% Bicycles	15.4	0	0	1.2	0	0	0	0	0	10.5	0	4.7	0	0	0	0	1	
Peds	3	-	-	3	-	-	0	0	5	-	-	5	-	-	-	3	11	
% Peds	27.3	-	-	27.3	-	-	0	0	45.5	-	-	45.5	-	-	-	27.3	11	



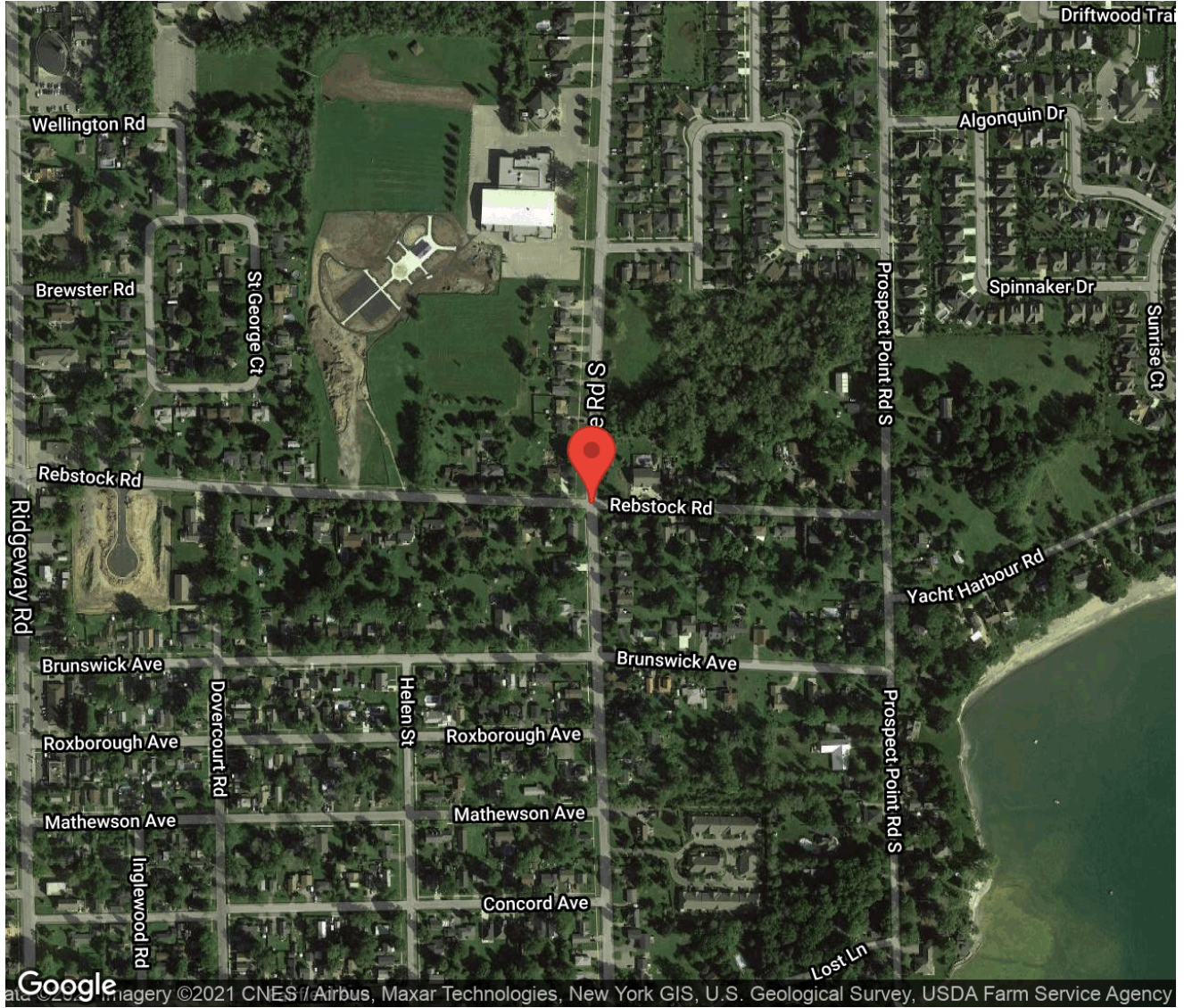
Project #21-057 - GHD

Intersection Count Report

Intersection:	Ridge Rd S & Rebstock Rd
Municipality:	Fort Erie
Count Date:	Apr 20, 2021
Site Code:	2105700002
Count Categories:	Cars, Trucks, Bicycles, Pedestrians
Count Period:	07:00-09:00, 16:00-18:00
Weather:	Clear

Traffic Count Map

Intersection: Ridge Rd S & Rebstock Rd
Site Code: 2105700002
Municipality: Fort Erie
Count Date: Apr 20, 2021



Traffic Count Summary

Intersection: Ridge Rd S & Rebstock Rd
 Site Code: 2105700002
 Municipality: Fort Erie
 Count Date: Apr 20, 2021

Ridge Rd S - Traffic Summary

Hour	North Approach Totals						South Approach Totals						Total
	Includes Cars, Trucks, Bicycles						Includes Cars, Trucks, Bicycles						
	Left	Thru	Right	U-Turn	Total	Peds	Left	Thru	Right	U-Turn	Total	Peds	
07:00 - 08:00	1	28	14	0	43	0	0	39	3	0	42	1	85
08:00 - 09:00	3	29	15	0	47	0	1	41	1	0	43	1	90
BREAK													
16:00 - 17:00	1	65	15	0	81	0	4	47	3	0	54	1	135
17:00 - 18:00	7	54	9	0	70	1	0	37	5	0	42	1	112
GRAND TOTAL	12	176	53	0	241	1	5	164	12	0	181	4	422



Traffic Count Summary

Intersection: Ridge Rd S & Rebstock Rd
 Site Code: 2105700002
 Municipality: Fort Erie
 Count Date: Apr 20, 2021

Rebstock Rd - Traffic Summary

Hour	East Approach Totals						West Approach Totals						Total
	Includes Cars, Trucks, Bicycles						Includes Cars, Trucks, Bicycles						
	Left	Thru	Right	U-Turn	Total	Peds	Left	Thru	Right	U-Turn	Total	Peds	
07:00 - 08:00	8	3	2	0	13	1	6	7	1	0	14	4	27
08:00 - 09:00	8	7	2	0	17	1	8	13	1	0	22	6	39
BREAK													
16:00 - 17:00	5	21	5	0	31	8	11	16	2	0	29	6	60
17:00 - 18:00	5	27	6	0	38	8	8	7	2	0	17	6	55
GRAND TOTAL	26	58	15	0	99	18	33	43	6	0	82	22	181

Traffic Count Data

Intersection: Ridge Rd S & Rebstock Rd
 Site Code: 2105700002
 Municipality: Fort Erie
 Count Date: Apr 20, 2021

North Approach - Ridge Rd S

Start Time	Cars			Trucks			Bicycles			Total Peds			
	←	↑	↻	←	↑	↻	←	↑	↻	←	↑	↻	
	Total			Total			Total			Total			
07:00	0	8	2	0	1	1	0	0	0	0	0	0	0
07:15	0	4	1	0	0	0	0	0	0	0	0	0	0
07:30	1	6	3	0	0	1	0	0	1	0	0	1	0
07:45	0	9	5	0	0	0	0	0	0	0	0	0	0
08:00	0	4	3	0	1	1	0	1	0	0	0	0	0
08:15	2	7	3	0	0	1	0	1	0	0	0	0	0
08:30	1	6	3	0	0	0	0	0	0	0	0	0	0
08:45	0	11	4	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	4	55	24	0	2	4	0	0	6	0	0	1	0

Traffic Count Data

Intersection: Ridge Rd S & Rebstock Rd
 Site Code: 2105700002
 Municipality: Fort Erie
 Count Date: Apr 20, 2021

North Approach - Ridge Rd S

Start Time	Cars			Trucks			Bicycles			Total Peds			
	←	↑	↻	←	↑	↻	←	↑	↻	←	↑	↻	
	0	15	4	0	0	1	0	0	0	0	0	0	0
16:00	0	15	4	0	0	1	0	0	0	0	0	0	0
16:15	0	20	2	0	0	2	0	0	0	0	0	0	0
16:30	0	15	3	0	1	0	0	0	1	0	0	1	0
16:45	1	14	1	0	0	1	0	0	0	0	0	0	0
17:00	0	13	1	0	0	0	0	0	0	0	0	0	0
17:15	1	14	2	0	1	0	0	1	0	0	0	1	0
17:30	3	10	3	0	0	0	0	0	0	0	0	0	1
17:45	3	15	2	0	0	1	0	0	0	0	0	0	0
SUBTOTAL	8	116	18	0	2	5	0	7	0	1	1	0	2
GRAND TOTAL	12	171	42	0	225	0	4	9	0	13	0	2	3



Traffic Count Data

Intersection: Ridge Rd S & Rebstock Rd
 Site Code: 2105700002
 Municipality: Fort Erie
 Count Date: Apr 20, 2021

South Approach - Ridge Rd S

Start Time	Cars			Trucks			Bicycles			Total Peds	
	←	↑	↻	←	↑	↻	←	↑	↻		
	Total			Total			Total			Total	
16:00	2	12	1	0	1	0	0	0	0	0	0
16:15	0	11	0	0	1	0	0	1	0	0	1
16:30	1	12	2	0	0	0	0	0	0	0	0
16:45	1	7	0	0	1	0	0	1	0	1	0
17:00	0	8	1	0	1	0	0	0	0	0	0
17:15	0	9	1	0	0	0	0	0	0	0	0
17:30	0	8	1	0	1	0	0	0	0	0	0
17:45	0	9	2	0	0	0	0	1	0	0	1
SUBTOTAL	4	76	8	0	5	0	0	5	0	3	0
GRAND TOTAL	5	155	12	0	172	0	5	0	0	4	0



Traffic Count Data

Intersection: Ridge Rd S & Rebstock Rd
 Site Code: 2105700002
 Municipality: Fort Erie
 Count Date: Apr 20, 2021

East Approach - Rebstock Rd

Start Time	Cars			Trucks			Bicycles			Total Peds		
	←	↑	↻	←	↑	↻	←	↑	↻			
	Total			Total			Total			Total		
07:00	3	0	0	0	0	0	0	0	0	0	1	
07:15	2	1	0	0	0	0	1	0	0	0	0	
07:30	0	1	2	0	0	0	0	0	0	0	0	
07:45	2	1	0	0	0	0	0	0	0	0	0	
08:00	3	4	0	0	0	0	0	0	0	0	0	
08:15	1	3	0	0	0	0	0	0	0	0	0	
08:30	1	0	1	0	0	2	0	0	0	0	0	
08:45	3	0	1	0	0	4	0	0	0	0	1	
SUBTOTAL	15	10	4	0	0	29	1	0	0	0	1	2



Traffic Count Data

Intersection: Ridge Rd S & Rebstock Rd
 Site Code: 2105700002
 Municipality: Fort Erie
 Count Date: Apr 20, 2021

East Approach - Rebstock Rd

Start Time	Cars			Trucks			Bicycles			Total Peds	
	←	↑	↻	←	↑	↻	←	↑	↻		
	Total			Total			Total				
16:00	1	8	1	0	0	0	0	0	0	0	1
16:15	1	3	2	0	0	0	0	0	0	0	3
16:30	1	10	1	0	0	0	0	0	0	0	2
16:45	2	0	1	0	0	0	0	0	0	0	2
17:00	1	8	2	0	0	0	0	0	0	0	3
17:15	2	4	2	0	0	0	0	0	0	0	2
17:30	1	5	1	0	0	0	0	0	0	0	2
17:45	1	10	1	0	0	0	0	0	0	0	1
SUBTOTAL	10	48	11	0	0	0	0	0	0	0	16
GRAND TOTAL	25	58	15	0	0	0	1	0	0	0	0

Traffic Count Data

Intersection: Ridge Rd S & Rebstock Rd
 Site Code: 2105700002
 Municipality: Fort Erie
 Count Date: Apr 20, 2021

West Approach - Rebstock Rd

Start Time	Cars			Trucks			Bicycles			Total Peds	
	←	↑	↻	←	↑	↻	←	↑	↻		
	Total			Total			Total			Total	
07:00	2	1	0	0	1	0	0	0	0	0	1
07:15	2	0	1	0	0	0	0	0	0	0	1
07:30	0	1	0	0	0	0	0	0	0	0	0
07:45	2	3	0	0	1	0	0	0	0	0	2
08:00	1	5	0	0	0	0	0	0	0	0	1
08:15	1	2	0	0	0	0	0	0	0	0	0
08:30	1	4	0	0	0	0	0	0	0	0	1
08:45	5	2	1	0	0	0	0	0	0	0	4
SUBTOTAL	14	18	2	0	2	0	0	0	0	0	10



Traffic Count Data

Intersection: Ridge Rd S & Rebstock Rd
 Site Code: 2105700002
 Municipality: Fort Erie
 Count Date: Apr 20, 2021

West Approach - Rebstock Rd

Start Time	Cars			Trucks			Bicycles			Total Peds		
	←	↑	↻	←	↑	↻	←	↑	↻			
	Total			Total			Total					
16:00	3	2	0	0	0	0	0	0	0	0	3	
16:15	3	7	1	0	0	0	0	0	0	0	0	
16:30	2	7	1	0	0	0	0	0	0	0	0	
16:45	3	0	0	0	0	0	0	0	0	0	3	
17:00	2	0	0	0	0	0	0	0	0	0	2	
17:15	3	1	0	0	0	0	0	0	0	0	1	
17:30	1	5	2	0	0	0	0	0	0	0	0	
17:45	2	1	0	0	0	0	0	0	0	0	3	
SUBTOTAL	19	23	4	0	0	0	0	0	0	0	12	
GRAND TOTAL	33	41	6	0	0	2	0	0	0	2	0	22

Peak Hour Diagram

Specified Period

From: 07:00:00
To: 09:00:00

One Hour Peak

From: 08:00:00
To: 09:00:00

Intersection: Ridge Rd S & Rebstock Rd
Site Code: 2105700002
Count Date: Apr 20, 2021

Weather conditions: Clear

**** Unsignalized Intersection ****

Major Road: Ridge Rd S runs N/S

North Approach

	Out	In	Total
	44	51	95
	3	0	3
	0	0	0
Totals	47	51	98

Ridge Rd S

	0	0	0	0
	2	1	0	0
	13	28	3	0
Totals	15	29	3	0

East Approach

	Out	In	Total
	17	17	34
	0	0	0
	0	0	0
Totals	17	17	34

Rebstock Rd

				Totals
	0	0	0	0
	0	0	8	8
	0	0	13	13
	0	0	1	1

Peds: 0

Peds: 6



Peds: 1

Peds: 1

Rebstock Rd

Totals			
0	0	0	0
2	2	0	0
7	7	0	0
8	8	0	0

West Approach

	Out	In	Total
	22	21	43
	0	2	2
	0	0	0
Totals	22	23	45

Totals			
1	41	1	0
0	0	0	0
0	0	0	0

Ridge Rd S

South Approach

Out	In	Total
43	37	80
0	1	1
0	0	0
43	38	81

- Cars

- Trucks

- Bicycles

Comments

Peak Hour Diagram

Specified Period

From: 16:00:00
To: 18:00:00

One Hour Peak

From: 16:00:00
To: 17:00:00

Intersection: Ridge Rd S & Rebstock Rd
Site Code: 2105700002
Count Date: Apr 20, 2021

Weather conditions: Clear

**** Unsignalized Intersection ****

Major Road: Ridge Rd S runs N/S

North Approach

	Out	In	Total
	75	58	133
	5	3	8
	1	2	3
Totals	81	63	144

Ridge Rd S

	1	0	0	0
	4	1	0	0
	10	64	1	0
Totals	15	65	1	0

East Approach

	Out	In	Total
	31	20	51
	0	0	0
	0	0	0
Totals	31	20	51

Rebstock Rd

				Totals
	0	0	0	0
	0	0	11	11
	0	0	16	16
	0	0	2	2

Peds: 0

Peds: 6



Peds: 8

Peds: 1

Rebstock Rd

Totals			
	0	0	0
	5	5	0
	21	21	0
	5	5	0

West Approach

	Out	In	Total
	29	35	64
	0	4	4
	0	1	1
Totals	29	40	69

Totals				
	4	42	3	0
	0	3	0	0
	0	2	0	0

Ridge Rd S

South Approach

	Out	In	Total
	49	71	120
	3	1	4
	2	0	2
Totals	54	72	126

- Cars

- Trucks

- Bicycles

Comments

Peak Hour Summary

Intersection: Ridge Rd S & Rebstock Rd
 Site Code: 2105700002
 Count Date: Apr 20, 2021
 Period: 16:00 - 18:00

Peak Hour Data (16:00 - 17:00)

Start Time	North Approach Ridge Rd S			South Approach Ridge Rd S			East Approach Rebstock Rd			West Approach Rebstock Rd			Total Vehicles													
	←	↑	↻	←	↑	↻	←	↑	↻	←	↑	↻		Total												
16:00	0	15	5	0	0	20	2	13	1	0	0	16	1	8	1	0	0	1	10	3	2	0	0	3	5	51
16:15	0	20	4	0	0	24	0	13	0	0	0	13	1	3	2	0	3	6	3	7	1	0	0	11	54	
16:30	0	16	4	0	0	20	1	12	2	0	1	15	1	10	1	0	2	12	2	7	1	0	0	10	57	
16:45	1	14	2	0	0	17	1	9	0	0	0	10	2	0	1	0	2	3	3	0	0	0	0	3	33	
Grand Total	1	65	15	0	0	81	4	47	3	0	1	54	5	21	5	0	8	31	11	16	2	0	6	29	195	
Approach %	1.2	80.2	18.5	0	-	-	7.4	87	5.6	0	-	-	16.1	67.7	16.1	0	-	-	37.9	55.2	6.9	0	-	-	-	
Totals %	0.5	33.3	7.7	0	41.5	0	2.1	24.1	1.5	0	27.7	0	2.6	10.8	2.6	0	15.9	0	5.6	8.2	1	0	14.9	0		
PHF	0.25	0.81	0.75	0	0.84	0	0.5	0.9	0.38	0	0.84	0	0.63	0.53	0.63	0	0.65	0	0.92	0.57	0.5	0	0.66	0.86		
Cars	1	64	10	0	75	0	4	42	3	0	49	5	21	5	0	31	11	16	2	2	0	29	184			
% Cars	100	98.5	66.7	0	92.6	0	100	89.4	100	0	90.7	100	100	100	0	100	100	100	100	100	100	0	100	94.4		
Trucks	0	1	4	0	5	0	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	8	
% Trucks	0	1.5	26.7	0	6.2	0	6.4	0	0	0	5.6	0	0	0	0	0	0	0	0	0	0	0	0	0	4.1	
Bicycles	0	0	1	0	1	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	3	
% Bicycles	0	0	6.7	0	1.2	0	4.3	0	0	0	3.7	0	0	0	0	0	0	0	0	0	0	0	0	0	1.5	
Peds	0	0	0	0	0	0	1	-	-	1	-	-	8	-	-	8	-	-	6	-	-	6	-	-	15	
% Peds	0	0	0	0	0	0	6.7	-	-	6.7	-	-	53.3	-	-	53.3	-	-	40	-	-	40	-	-	40	

Signal Code: RDGRBS						
Intersection: RIDGEWAY RD. & REBSTOCK RD.						
Municipality: forterie						
Owner: City						
Last Modified: 4/29/2021 10:32:35 AM						
Timing Parameters	NBD & SBD RIDGEWAY	EBD & WBD REBSTOCK	n/a	n/a	n/a	n/a
Min Green	30	18	0	0	0	0
Walk	10	10	0	0	0	0
Ped Clearance	20	12	0	0	0	0
Vehicle Ext.	0	0	0	0	0	0
Max Green	30	22	0	0	0	0
Yellow	4.1	4.1	0	0	0	0
All Red	2	2	0	0	0	0

		Offset
Minimum Cycle	64.2	0
Pedestrian Cycle	60.2	
Maximum Cycle	64.2	0
Operation	FT	

Installed On:

1/10/2001

Count Date:

--/--/----

FA = Fully Actuated

SA = Semi Actuated

FT = Fixed Time

Close Window

Print Entry*

Refresh Entry

***Note: you need to change the paper orientation from Portrait to Landscape**

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Appendix C

Synchro Reports

Lanes, Volumes, Timings
1: Ridgeway Road & Rebstock Road

Existing 2021AM Peak Hour
04/30/2021



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	7	14	12	9	12	8	5	168	12	7	134	2
Future Volume (vph)	7	14	12	9	12	8	5	168	12	7	134	2
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.951			0.962			0.991			0.998	
Fl _t Protected		0.989			0.985			0.999			0.997	
Satd. Flow (prot)	0	1632	0	0	1644	0	0	1717	0	0	1726	0
Fl _t Permitted		0.957			0.937			0.994			0.985	
Satd. Flow (perm)	0	1579	0	0	1564	0	0	1709	0	0	1705	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		13			9			7			1	
Link Speed (k/h)		48			48			48			48	
Link Distance (m)		122.7			454.8			194.6			230.0	
Travel Time (s)		9.2			34.1			14.6			17.3	
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
Adj. Flow (vph)	8	15	13	10	13	9	5	183	13	8	146	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	36	0	0	32	0	0	201	0	0	156	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		8			8			4			4	
Permitted Phases	8			8			4			4		
Minimum Split (s)	28.1	28.1		28.1	28.1		36.1	36.1		36.1	36.1	
Total Split (s)	28.1	28.1		28.1	28.1		36.1	36.1		36.1	36.1	
Total Split (%)	43.8%	43.8%		43.8%	43.8%		56.2%	56.2%		56.2%	56.2%	
Maximum Green (s)	22.0	22.0		22.0	22.0		30.0	30.0		30.0	30.0	
Yellow Time (s)	4.1	4.1		4.1	4.1		4.1	4.1		4.1	4.1	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		6.1			6.1			6.1			6.1	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Flash Dont Walk (s)	12.0	12.0		12.0	12.0		20.0	20.0		20.0	20.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		22.0			22.0			30.0			30.0	
Actuated g/C Ratio		0.34			0.34			0.47			0.47	
v/c Ratio		0.07			0.06			0.25			0.20	
Control Delay		11.0			11.8			11.0			10.8	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		11.0			11.8			11.0			10.8	

Lanes, Volumes, Timings
 1: Ridgeway Road & Rebstock Road

Existing 2021AM Peak Hour
 04/30/2021



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS		B			B			B			B	
Approach Delay		11.0			11.8			11.0			10.8	
Approach LOS		B			B			B			B	

Intersection Summary

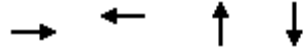
Area Type:	Other
Cycle Length:	64.2
Actuated Cycle Length:	64.2
Offset:	30 (47%), Referenced to phase 2: and 6:, Start of Green
Natural Cycle:	65
Control Type:	Pretimed
Maximum v/c Ratio:	0.25
Intersection Signal Delay:	11.0
Intersection LOS:	B
Intersection Capacity Utilization	26.5%
ICU Level of Service	A
Analysis Period (min)	15

Splits and Phases: 1: Ridgeway Road & Rebstock Road



Queues
1: Ridgeway Road & Rebstock Road

Existing 2021AM Peak Hour
04/30/2021



Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	36	32	201	156
v/c Ratio	0.07	0.06	0.25	0.20
Control Delay	11.0	11.8	11.0	10.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	11.0	11.8	11.0	10.8
Queue Length 50th (m)	1.8	1.8	13.0	10.2
Queue Length 95th (m)	7.0	6.7	24.4	19.8
Internal Link Dist (m)	98.7	430.8	170.6	206.0
Turn Bay Length (m)				
Base Capacity (vph)	549	541	802	797
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.07	0.06	0.25	0.20
Intersection Summary				

HCM Signalized Intersection Capacity Analysis
 1: Ridgeway Road & Rebstock Road

Existing 2021AM Peak Hour
 04/30/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	7	14	12	9	12	8	5	168	12	7	134	2
Future Volume (vph)	7	14	12	9	12	8	5	168	12	7	134	2
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		6.1			6.1			6.1			6.1	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.95			0.96			0.99			1.00	
Flt Protected		0.99			0.98			1.00			1.00	
Satd. Flow (prot)		1632			1643			1717			1727	
Flt Permitted		0.96			0.94			0.99			0.99	
Satd. Flow (perm)		1579			1564			1710			1706	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	8	15	13	10	13	9	5	183	13	8	146	2
RTOR Reduction (vph)	0	9	0	0	6	0	0	4	0	0	1	0
Lane Group Flow (vph)	0	27	0	0	26	0	0	197	0	0	155	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		8			8			4			4	
Permitted Phases	8			8			4			4		
Actuated Green, G (s)		22.0			22.0			30.0			30.0	
Effective Green, g (s)		22.0			22.0			30.0			30.0	
Actuated g/C Ratio		0.34			0.34			0.47			0.47	
Clearance Time (s)		6.1			6.1			6.1			6.1	
Lane Grp Cap (vph)		541			535			799			797	
v/s Ratio Prot												
v/s Ratio Perm		c0.02			0.02			c0.12			0.09	
v/c Ratio		0.05			0.05			0.25			0.20	
Uniform Delay, d1		14.1			14.1			10.3			10.0	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.2			0.2			0.7			0.5	
Delay (s)		14.3			14.3			11.0			10.6	
Level of Service		B			B			B			B	
Approach Delay (s)		14.3			14.3			11.0			10.6	
Approach LOS		B			B			B			B	

Intersection Summary		
HCM 2000 Control Delay	11.4	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.16	B
Actuated Cycle Length (s)	64.2	Sum of lost time (s)
Intersection Capacity Utilization	26.5%	12.2
Analysis Period (min)	15	ICU Level of Service
		A
c Critical Lane Group		

Lanes, Volumes, Timings
2: Rebstock Road & Site Access

Existing 2021AM Peak Hour
04/30/2021



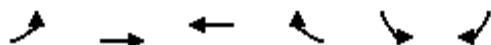
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↔		↙	↘
Traffic Volume (vph)	0	33	32	0	0	0
Future Volume (vph)	0	33	32	0	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr						
Flt Protected						
Satd. Flow (prot)	0	1735	1735	0	1735	0
Flt Permitted						
Satd. Flow (perm)	0	1735	1735	0	1735	0
Link Speed (k/h)		48	48		48	
Link Distance (m)		454.8	83.8		35.6	
Travel Time (s)		34.1	6.3		2.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	36	35	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	36	35	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.10	1.10	1.10	1.10	1.10	1.10
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	6.7%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis
2: Rebstock Road & Site Access

Existing 2021AM Peak Hour
04/30/2021



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↔		↕	
Traffic Volume (veh/h)	0	33	32	0	0	0
Future Volume (Veh/h)	0	33	32	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	36	35	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	35				71	35
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	35				71	35
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)	1576				933	1038
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	36	35	0			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1576	1700	1700			
Volume to Capacity	0.00	0.02	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS			A			
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			6.7%	ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings
3: Ridge Road South & Rebstock Road

Existing 2021AM Peak Hour
04/30/2021



















Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	11	18	1	11	9	2	1	57	1	4	40	21
Future Volume (vph)	11	18	1	11	9	2	1	57	1	4	40	21
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.996			0.989			0.998			0.956	
Flt Protected		0.982			0.976			0.999			0.997	
Satd. Flow (prot)	0	1697	0	0	1674	0	0	1730	0	0	1653	0
Flt Permitted		0.982			0.976			0.999			0.997	
Satd. Flow (perm)	0	1697	0	0	1674	0	0	1730	0	0	1653	0
Link Speed (k/h)		48			48			48			48	
Link Distance (m)		83.8			111.6			142.4			290.0	
Travel Time (s)		6.3			8.4			10.7			21.8	
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
Adj. Flow (vph)	12	20	1	12	10	2	1	62	1	4	43	23
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	33	0	0	24	0	0	64	0	0	70	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	16.2%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
3: Ridge Road South & Rebstock Road

Existing 2021AM Peak Hour
04/30/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	18	1	11	9	2	1	57	1	4	40	21
Future Volume (Veh/h)	11	18	1	11	9	2	1	57	1	4	40	21
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			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)	12	20	1	12	10	2	1	62	1	4	43	23
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	12			21			124	80	20	112	80	11
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	12			21			124	80	20	112	80	11
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			100	92	100	100	95	98
cM capacity (veh/h)	1607			1595			789	798	1057	805	798	1070
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	33	24	64	70								
Volume Left	12	12	1	4								
Volume Right	1	2	1	23								
cSH	1607	1595	801	871								
Volume to Capacity	0.01	0.01	0.08	0.08								
Queue Length 95th (m)	0.2	0.2	2.0	2.0								
Control Delay (s)	2.7	3.7	9.9	9.5								
Lane LOS	A	A	A	A								
Approach Delay (s)	2.7	3.7	9.9	9.5								
Approach LOS			A	A								
Intersection Summary												
Average Delay			7.7									
Intersection Capacity Utilization			16.2%	ICU Level of Service	A							
Analysis Period (min)			15									

Lanes, Volumes, Timings
1: Ridgeway Road & Rebstock Road

Existing 2021PM Peak Hour
04/30/2021



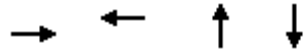
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	9	7	15	23	26	9	15	200	16	18	194	14
Future Volume (vph)	9	7	15	23	26	9	15	200	16	18	194	14
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.936			0.979			0.991			0.992	
Fl _t Protected		0.986			0.981			0.997			0.996	
Satd. Flow (prot)	0	1601	0	0	1666	0	0	1714	0	0	1714	0
Fl _t Permitted		0.936			0.901			0.975			0.966	
Satd. Flow (perm)	0	1520	0	0	1530	0	0	1676	0	0	1662	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		16			10			8			7	
Link Speed (k/h)		48			48			48			48	
Link Distance (m)		122.7			454.8			194.6			230.0	
Travel Time (s)		9.2			34.1			14.6			17.3	
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
Adj. Flow (vph)	10	8	16	25	28	10	16	217	17	20	211	15
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	34	0	0	63	0	0	250	0	0	246	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		8			8			4			4	
Permitted Phases	8			8			4			4		
Minimum Split (s)	28.1	28.1		28.1	28.1		36.1	36.1		36.1	36.1	
Total Split (s)	28.1	28.1		28.1	28.1		36.1	36.1		36.1	36.1	
Total Split (%)	43.8%	43.8%		43.8%	43.8%		56.2%	56.2%		56.2%	56.2%	
Maximum Green (s)	22.0	22.0		22.0	22.0		30.0	30.0		30.0	30.0	
Yellow Time (s)	4.1	4.1		4.1	4.1		4.1	4.1		4.1	4.1	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		6.1			6.1			6.1			6.1	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Flash Dont Walk (s)	12.0	12.0		12.0	12.0		20.0	20.0		20.0	20.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		22.0			22.0			30.0			30.0	
Actuated g/C Ratio		0.34			0.34			0.47			0.47	
v/c Ratio		0.06			0.12			0.32			0.32	
Control Delay		10.2			13.4			11.7			11.8	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		10.2			13.4			11.7			11.8	

Queues

Existing 2021PM Peak Hour

04/30/2021

















1: Ridgeway Road & Rebstock Road



Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	34	63	250	246
v/c Ratio	0.06	0.12	0.32	0.32
Control Delay	10.2	13.4	11.7	11.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	10.2	13.4	11.7	11.8
Queue Length 50th (m)	1.4	4.2	16.9	16.6
Queue Length 95th (m)	6.4	11.3	30.6	30.1
Internal Link Dist (m)	98.7	430.8	170.6	206.0
Turn Bay Length (m)				
Base Capacity (vph)	531	530	787	780
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.06	0.12	0.32	0.32
Intersection Summary				

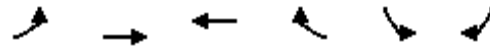
HCM Signalized Intersection Capacity Analysis
 1: Ridgeway Road & Rebstock Road

Existing 2021PM Peak Hour
 04/30/2021

														
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations														
Traffic Volume (vph)	9	7	15	23	26	9	15	200	16	18	194	14		
Future Volume (vph)	9	7	15	23	26	9	15	200	16	18	194	14		
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750		
Total Lost time (s)		6.1			6.1			6.1			6.1			
Lane Util. Factor		1.00			1.00			1.00			1.00			
Frt		0.94			0.98			0.99			0.99			
Flt Protected		0.99			0.98			1.00			1.00			
Satd. Flow (prot)		1601			1665			1713			1714			
Flt Permitted		0.94			0.90			0.97			0.97			
Satd. Flow (perm)		1520			1530			1676			1662			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92		
Adj. Flow (vph)	10	8	16	25	28	10	16	217	17	20	211	15		
RTOR Reduction (vph)	0	11	0	0	7	0	0	4	0	0	4	0		
Lane Group Flow (vph)	0	23	0	0	56	0	0	246	0	0	242	0		
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA			
Protected Phases		8			8			4			4			
Permitted Phases	8			8			4			4				
Actuated Green, G (s)		22.0			22.0			30.0			30.0			
Effective Green, g (s)		22.0			22.0			30.0			30.0			
Actuated g/C Ratio		0.34			0.34			0.47			0.47			
Clearance Time (s)		6.1			6.1			6.1			6.1			
Lane Grp Cap (vph)		520			524			783			776			
v/s Ratio Prot														
v/s Ratio Perm		0.02			0.04			0.15			0.15			
v/c Ratio		0.05			0.11			0.31			0.31			
Uniform Delay, d1		14.1			14.4			10.7			10.7			
Progression Factor		1.00			1.00			1.00			1.00			
Incremental Delay, d2		0.2			0.4			1.0			1.0			
Delay (s)		14.3			14.8			11.7			11.7			
Level of Service		B			B			B			B			
Approach Delay (s)		14.3			14.8			11.7			11.7			
Approach LOS		B			B			B			B			
Intersection Summary														
HCM 2000 Control Delay			12.2									HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio			0.23											
Actuated Cycle Length (s)			64.2								12.2			
Intersection Capacity Utilization			33.2%										ICU Level of Service	A
Analysis Period (min)			15											
c Critical Lane Group														

Lanes, Volumes, Timings
2: Rebstock Road & Site Access

Existing 2021PM Peak Hour
04/30/2021



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	42	56	0	0	0
Future Volume (vph)	0	42	56	0	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr						
Flt Protected						
Satd. Flow (prot)	0	1735	1735	0	1735	0
Flt Permitted						
Satd. Flow (perm)	0	1735	1735	0	1735	0
Link Speed (k/h)		48	48		48	
Link Distance (m)		454.8	83.8		35.6	
Travel Time (s)		34.1	6.3		2.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	46	61	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	46	61	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.10	1.10	1.10	1.10	1.10	1.10
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	6.7%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
2: Rebstock Road & Site Access

Existing 2021PM Peak Hour
04/30/2021



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↔		↕	
Traffic Volume (veh/h)	0	42	56	0	0	0
Future Volume (Veh/h)	0	42	56	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	46	61	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	61				107	61
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	61				107	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 %	100				100	100
cM capacity (veh/h)	1542				891	1004
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	46	61	0			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1542	1700	1700			
Volume to Capacity	0.00	0.04	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS			A			
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			6.7%	ICU Level of Service	A	
Analysis Period (min)			15			

Lanes, Volumes, Timings
3: Ridge Road South & Rebstock Road

Existing 2021PM Peak Hour
04/30/2021



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	15	22	2	7	29	7	5	58	4	1	91	21
Future Volume (vph)	15	22	2	7	29	7	5	58	4	1	91	21
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.994			0.977			0.992			0.975	
Fl _t Protected		0.981			0.992			0.997				
Satd. Flow (prot)	0	1692	0	0	1681	0	0	1716	0	0	1691	0
Fl _t Permitted		0.981			0.992			0.997				
Satd. Flow (perm)	0	1692	0	0	1681	0	0	1716	0	0	1691	0
Link Speed (k/h)		48			48			48			48	
Link Distance (m)		83.8			111.6			142.4			290.0	
Travel Time (s)		6.3			8.4			10.7			21.8	
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
Adj. Flow (vph)	16	24	2	8	32	8	5	63	4	1	99	23
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	42	0	0	48	0	0	72	0	0	123	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	18.5%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis
3: Ridge Road South & Rebstock Road

Existing 2021PM Peak Hour
04/30/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	15	22	2	7	29	7	5	58	4	1	91	21
Future Volume (Veh/h)	15	22	2	7	29	7	5	58	4	1	91	21
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			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)	16	24	2	8	32	8	5	63	4	1	99	23
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	40			26			182	113	25	144	110	36
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	40			26			182	113	25	144	110	36
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			99	92	100	100	87	98
cM capacity (veh/h)	1570			1588			680	765	1051	761	768	1037
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	42	48	72	123								
Volume Left	16	8	5	1								
Volume Right	2	8	4	23								
cSH	1570	1588	770	807								
Volume to Capacity	0.01	0.01	0.09	0.15								
Queue Length 95th (m)	0.2	0.1	2.3	4.1								
Control Delay (s)	2.8	1.2	10.2	10.3								
Lane LOS	A	A	B	B								
Approach Delay (s)	2.8	1.2	10.2	10.3								
Approach LOS			B	B								
Intersection Summary												
Average Delay			7.6									
Intersection Capacity Utilization			18.5%	ICU Level of Service	A							
Analysis Period (min)			15									

Lanes, Volumes, Timings
1: Ridgeway Road & Rebstock Road

Future Background 2026AM Peak Hour
04/30/2021



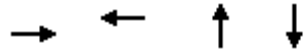
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	7	15	14	10	14	9	6	185	14	7	148	3
Future Volume (vph)	7	15	14	10	14	9	6	185	14	7	148	3
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.948			0.962			0.991			0.998	
Fl _t Protected		0.990			0.985			0.998			0.998	
Satd. Flow (prot)	0	1628	0	0	1644	0	0	1716	0	0	1728	0
Fl _t Permitted		0.959			0.936			0.992			0.986	
Satd. Flow (perm)	0	1577	0	0	1562	0	0	1705	0	0	1707	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		15			10			8			2	
Link Speed (k/h)		48			48			48			48	
Link Distance (m)		122.7			454.8			194.6			230.0	
Travel Time (s)		9.2			34.1			14.6			17.3	
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
Adj. Flow (vph)	8	16	15	11	15	10	7	201	15	8	161	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	39	0	0	36	0	0	223	0	0	172	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		8			8			4			4	
Permitted Phases	8			8			4			4		
Minimum Split (s)	28.1	28.1		28.1	28.1		36.1	36.1		36.1	36.1	
Total Split (s)	28.1	28.1		28.1	28.1		36.1	36.1		36.1	36.1	
Total Split (%)	43.8%	43.8%		43.8%	43.8%		56.2%	56.2%		56.2%	56.2%	
Maximum Green (s)	22.0	22.0		22.0	22.0		30.0	30.0		30.0	30.0	
Yellow Time (s)	4.1	4.1		4.1	4.1		4.1	4.1		4.1	4.1	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		6.1			6.1			6.1			6.1	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Flash Dont Walk (s)	12.0	12.0		12.0	12.0		20.0	20.0		20.0	20.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		22.0			22.0			30.0			30.0	
Actuated g/C Ratio		0.34			0.34			0.47			0.47	
v/c Ratio		0.07			0.07			0.28			0.22	
Control Delay		10.8			11.8			11.3			10.9	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		10.8			11.8			11.3			10.9	

Queues

Future Background 2026AM Peak Hour

1: Ridgeway Road & Rebstock Road

04/30/2021



Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	39	36	223	172
v/c Ratio	0.07	0.07	0.28	0.22
Control Delay	10.8	11.8	11.3	10.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	10.8	11.8	11.3	10.9
Queue Length 50th (m)	1.9	2.0	14.6	11.3
Queue Length 95th (m)	7.2	7.2	27.0	21.6
Internal Link Dist (m)	98.7	430.8	170.6	206.0
Turn Bay Length (m)				
Base Capacity (vph)	550	541	800	798
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.07	0.07	0.28	0.22
Intersection Summary				

HCM Signalized Intersection Capacity Analysis
1: Ridgeway Road & Rebstock Road

Future Background 2026AM Peak Hour
04/30/2021



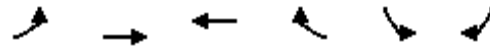
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	7	15	14	10	14	9	6	185	14	7	148	3
Future Volume (vph)	7	15	14	10	14	9	6	185	14	7	148	3
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		6.1			6.1			6.1			6.1	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.95			0.96			0.99			1.00	
Flt Protected		0.99			0.98			1.00			1.00	
Satd. Flow (prot)		1628			1645			1716			1727	
Flt Permitted		0.96			0.94			0.99			0.99	
Satd. Flow (perm)		1578			1564			1705			1706	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	8	16	15	11	15	10	7	201	15	8	161	3
RTOR Reduction (vph)	0	10	0	0	7	0	0	4	0	0	1	0
Lane Group Flow (vph)	0	29	0	0	29	0	0	219	0	0	171	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		8			8			4			4	
Permitted Phases	8			8			4			4		
Actuated Green, G (s)		22.0			22.0			30.0			30.0	
Effective Green, g (s)		22.0			22.0			30.0			30.0	
Actuated g/C Ratio		0.34			0.34			0.47			0.47	
Clearance Time (s)		6.1			6.1			6.1			6.1	
Lane Grp Cap (vph)		540			535			796			797	
v/s Ratio Prot												
v/s Ratio Perm		0.02			0.02			0.13			0.10	
v/c Ratio		0.05			0.06			0.27			0.21	
Uniform Delay, d1		14.1			14.1			10.5			10.1	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.2			0.2			0.9			0.6	
Delay (s)		14.3			14.3			11.3			10.7	
Level of Service		B			B			B			B	
Approach Delay (s)		14.3			14.3			11.3			10.7	
Approach LOS		B			B			B			B	

Intersection Summary

HCM 2000 Control Delay	11.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.18		
Actuated Cycle Length (s)	64.2	Sum of lost time (s)	12.2
Intersection Capacity Utilization	28.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
2: Rebstock Road & Site Access

Future Background 2026AM Peak Hour
04/30/2021



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	34	35	0	0	0
Future Volume (vph)	0	34	35	0	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr						
Flt Protected						
Satd. Flow (prot)	0	1735	1735	0	1735	0
Flt Permitted						
Satd. Flow (perm)	0	1735	1735	0	1735	0
Link Speed (k/h)		48	48		48	
Link Distance (m)		454.8	83.8		35.6	
Travel Time (s)		34.1	6.3		2.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	37	38	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	37	38	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.10	1.10	1.10	1.10	1.10	1.10
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization 6.7%	ICU Level of Service A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
2: Rebstock Road & Site Access

Future Background 2026AM Peak Hour
04/30/2021



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Traffic Volume (veh/h)	0	34	35	0	0	0
Future Volume (Veh/h)	0	34	35	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	37	38	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	38				75	38
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	38				75	38
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)	1572				928	1034
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	37	38	0			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1572	1700	1700			
Volume to Capacity	0.00	0.02	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS			A			
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			6.7%	ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings
3: Ridge Road South & Rebstock Road

Future Background 2026AM Peak Hour
04/30/2021



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	12	20	1	12	10	3	1	63	1	4	44	23
Future Volume (vph)	12	20	1	12	10	3	1	63	1	4	44	23
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.996			0.985			0.998			0.956	
Flt Protected		0.982			0.976			0.999			0.997	
Satd. Flow (prot)	0	1697	0	0	1668	0	0	1730	0	0	1653	0
Flt Permitted		0.982			0.976			0.999			0.997	
Satd. Flow (perm)	0	1697	0	0	1668	0	0	1730	0	0	1653	0
Link Speed (k/h)		48			48			48			48	
Link Distance (m)		83.8			111.6			142.4			290.0	
Travel Time (s)		6.3			8.4			10.7			21.8	
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
Adj. Flow (vph)	13	22	1	13	11	3	1	68	1	4	48	25
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	36	0	0	27	0	0	70	0	0	77	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	16.6%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis
3: Ridge Road South & Rebstock Road

Future Background 2026AM Peak Hour
04/30/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	12	20	1	12	10	3	1	63	1	4	44	23
Future Volume (Veh/h)	12	20	1	12	10	3	1	63	1	4	44	23
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			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)	13	22	1	13	11	3	1	68	1	4	48	25
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	14			23			136	88	22	122	88	12
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	14			23			136	88	22	122	88	12
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			100	91	100	99	94	98
cM capacity (veh/h)	1604			1592			768	789	1054	786	790	1068
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	36	27	70	77								
Volume Left	13	13	1	4								
Volume Right	1	3	1	25								
cSH	1604	1592	791	862								
Volume to Capacity	0.01	0.01	0.09	0.09								
Queue Length 95th (m)	0.2	0.2	2.2	2.2								
Control Delay (s)	2.7	3.5	10.0	9.6								
Lane LOS	A	A	A	A								
Approach Delay (s)	2.7	3.5	10.0	9.6								
Approach LOS			A	A								
Intersection Summary												
Average Delay			7.8									
Intersection Capacity Utilization			16.6%	ICU Level of Service	A							
Analysis Period (min)			15									

Lanes, Volumes, Timings
1: Ridgeway Road & Rebstock Road

Future Background 2026PM Peak Hour

04/30/2021



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	10	7	17	26	29	10	17	221	18	20	214	15
Future Volume (vph)	10	7	17	26	29	10	17	221	18	20	214	15
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.934			0.979			0.990			0.992	
Fl _t Protected		0.985			0.981			0.997			0.996	
Satd. Flow (prot)	0	1596	0	0	1666	0	0	1712	0	0	1714	0
Fl _t Permitted		0.932			0.898			0.972			0.963	
Satd. Flow (perm)	0	1510	0	0	1525	0	0	1669	0	0	1657	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		18			11			8			7	
Link Speed (k/h)		48			48			48			48	
Link Distance (m)		122.7			454.8			194.6			230.0	
Travel Time (s)		9.2			34.1			14.6			17.3	
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
Adj. Flow (vph)	11	8	18	28	32	11	18	240	20	22	233	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	37	0	0	71	0	0	278	0	0	271	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		8			8			4			4	
Permitted Phases	8			8			4			4		
Minimum Split (s)	28.1	28.1		28.1	28.1		36.1	36.1		36.1	36.1	
Total Split (s)	28.1	28.1		28.1	28.1		36.1	36.1		36.1	36.1	
Total Split (%)	43.8%	43.8%		43.8%	43.8%		56.2%	56.2%		56.2%	56.2%	
Maximum Green (s)	22.0	22.0		22.0	22.0		30.0	30.0		30.0	30.0	
Yellow Time (s)	4.1	4.1		4.1	4.1		4.1	4.1		4.1	4.1	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		6.1			6.1			6.1			6.1	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Flash Dont Walk (s)	12.0	12.0		12.0	12.0		20.0	20.0		20.0	20.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		22.0			22.0			30.0			30.0	
Actuated g/C Ratio		0.34			0.34			0.47			0.47	
v/c Ratio		0.07			0.13			0.35			0.35	
Control Delay		10.0			13.6			12.2			12.2	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		10.0			13.6			12.2			12.2	

Lanes, Volumes, Timings
 1: Ridgeway Road & Rebstock Road

Future Background 2026PM Peak Hour
 04/30/2021

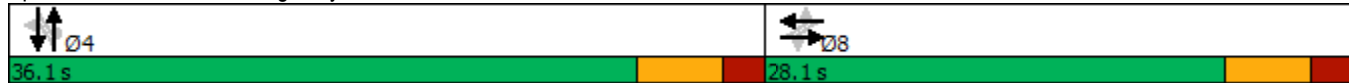


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS		A			B			B			B	
Approach Delay		10.0			13.6			12.2			12.2	
Approach LOS		A			B			B			B	

Intersection Summary

Area Type: Other
 Cycle Length: 64.2
 Actuated Cycle Length: 64.2
 Offset: 34 (53%), Referenced to phase 2: and 6:, Start of Green
 Natural Cycle: 65
 Control Type: Pretimed
 Maximum v/c Ratio: 0.35
 Intersection Signal Delay: 12.2
 Intersection LOS: B
 Intersection Capacity Utilization 35.6%
 ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 1: Ridgeway Road & Rebstock Road

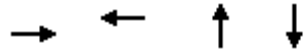


Queues

Future Background 2026PM Peak Hour

1: Ridgeway Road & Rebstock Road

04/30/2021



Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	37	71	278	271
v/c Ratio	0.07	0.13	0.35	0.35
Control Delay	10.0	13.6	12.2	12.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	10.0	13.6	12.2	12.2
Queue Length 50th (m)	1.5	4.8	19.2	18.7
Queue Length 95th (m)	6.7	12.4	34.3	33.6
Internal Link Dist (m)	98.7	430.8	170.6	206.0
Turn Bay Length (m)				
Base Capacity (vph)	529	529	784	778
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.07	0.13	0.35	0.35
Intersection Summary				

HCM Signalized Intersection Capacity Analysis
1: Ridgeway Road & Rebstock Road

Future Background 2026PM Peak Hour
04/30/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	10	7	17	26	29	10	17	221	18	20	214	15
Future Volume (vph)	10	7	17	26	29	10	17	221	18	20	214	15
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		6.1			6.1			6.1			6.1	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.93			0.98			0.99			0.99	
Flt Protected		0.99			0.98			1.00			1.00	
Satd. Flow (prot)		1597			1666			1712			1714	
Flt Permitted		0.93			0.90			0.97			0.96	
Satd. Flow (perm)		1510			1525			1670			1657	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	8	18	28	32	11	18	240	20	22	233	16
RTOR Reduction (vph)	0	12	0	0	7	0	0	4	0	0	4	0
Lane Group Flow (vph)	0	25	0	0	64	0	0	274	0	0	267	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		8			8			4			4	
Permitted Phases	8			8			4			4		
Actuated Green, G (s)		22.0			22.0			30.0			30.0	
Effective Green, g (s)		22.0			22.0			30.0			30.0	
Actuated g/C Ratio		0.34			0.34			0.47			0.47	
Clearance Time (s)		6.1			6.1			6.1			6.1	
Lane Grp Cap (vph)		517			522			780			774	
v/s Ratio Prot												
v/s Ratio Perm		0.02			0.04			0.16			0.16	
v/c Ratio		0.05			0.12			0.35			0.35	
Uniform Delay, d1		14.1			14.5			10.9			10.9	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.2			0.5			1.2			1.2	
Delay (s)		14.3			15.0			12.1			12.1	
Level of Service		B			B			B			B	
Approach Delay (s)		14.3			15.0			12.1			12.1	
Approach LOS		B			B			B			B	

Intersection Summary

HCM 2000 Control Delay	12.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.25		
Actuated Cycle Length (s)	64.2	Sum of lost time (s)	12.2
Intersection Capacity Utilization	35.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
2: Rebstock Road & Site Access

Future Background 2026PM Peak Hour
04/30/2021



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	
Traffic Volume (vph)	0	46	61	0	0	0
Future Volume (vph)	0	46	61	0	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	0	1735	1735	0	1735	0
Flt Permitted						
Satd. Flow (perm)	0	1735	1735	0	1735	0
Link Speed (k/h)		48	48		48	
Link Distance (m)		454.8	83.8		35.6	
Travel Time (s)		34.1	6.3		2.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	50	66	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	50	66	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.10	1.10	1.10	1.10	1.10	1.10
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	6.8%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis
2: Rebstock Road & Site Access

Future Background 2026PM Peak Hour
04/30/2021



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↔		↕	
Traffic Volume (veh/h)	0	46	61	0	0	0
Future Volume (Veh/h)	0	46	61	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	50	66	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	66				116	66
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	66				116	66
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)	1536				880	998
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	50	66	0			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1536	1700	1700			
Volume to Capacity	0.00	0.04	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS			A			
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			6.8%	ICU Level of Service	A	
Analysis Period (min)			15			

Lanes, Volumes, Timings
3: Ridge Road South & Rebstock Road

Future Background 2026PM Peak Hour
04/30/2021



















Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	17	24	3	7	32	7	6	65	4	1	100	23
Future Volume (vph)	17	24	3	7	32	7	6	65	4	1	100	23
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.991			0.979			0.993			0.975	
Fl _t Protected		0.981			0.992			0.996				
Satd. Flow (prot)	0	1686	0	0	1685	0	0	1716	0	0	1691	0
Fl _t Permitted		0.981			0.992			0.996				
Satd. Flow (perm)	0	1686	0	0	1685	0	0	1716	0	0	1691	0
Link Speed (k/h)		48			48			48			48	
Link Distance (m)		83.8			111.6			142.4			290.0	
Travel Time (s)		6.3			8.4			10.7			21.8	
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
Adj. Flow (vph)	18	26	3	8	35	8	7	71	4	1	109	25
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	47	0	0	51	0	0	82	0	0	135	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	20.5%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis
3: Ridge Road South & Rebstock Road

Future Background 2026PM Peak Hour
04/30/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	17	24	3	7	32	7	6	65	4	1	100	23
Future Volume (Veh/h)	17	24	3	7	32	7	6	65	4	1	100	23
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			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)	18	26	3	8	35	8	7	71	4	1	109	25
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	43			29			198	122	28	158	120	39
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	43			29			198	122	28	158	120	39
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			99	91	100	100	86	98
cM capacity (veh/h)	1566			1584			652	755	1048	738	758	1033
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	47	51	82	135								
Volume Left	18	8	7	1								
Volume Right	3	8	4	25								
cSH	1566	1584	755	797								
Volume to Capacity	0.01	0.01	0.11	0.17								
Queue Length 95th (m)	0.3	0.1	2.8	4.6								
Control Delay (s)	2.9	1.2	10.3	10.4								
Lane LOS	A	A	B	B								
Approach Delay (s)	2.9	1.2	10.3	10.4								
Approach LOS			B	B								
Intersection Summary												
Average Delay			7.8									
Intersection Capacity Utilization			20.5%		ICU Level of Service				A			
Analysis Period (min)			15									

Lanes, Volumes, Timings
1: Ridgeway Road & Rebstock Road

Future Total 2026AM Peak Hour
04/30/2021



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	7	18	14	18	23	15	6	185	17	9	148	3
Future Volume (vph)	7	18	14	18	23	15	6	185	17	9	148	3
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.953			0.965			0.989			0.998	
Fl _t Protected		0.991			0.984			0.998			0.997	
Satd. Flow (prot)	0	1638	0	0	1647	0	0	1712	0	0	1726	0
Fl _t Permitted		0.960			0.920			0.992			0.981	
Satd. Flow (perm)	0	1587	0	0	1540	0	0	1702	0	0	1698	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		15			16			9			2	
Link Speed (k/h)		48			48			48			48	
Link Distance (m)		122.7			454.8			194.6			230.0	
Travel Time (s)		9.2			34.1			14.6			17.3	
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
Adj. Flow (vph)	8	20	15	20	25	16	7	201	18	10	161	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	43	0	0	61	0	0	226	0	0	174	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		8			8			4			4	
Permitted Phases	8			8			4			4		
Minimum Split (s)	28.1	28.1		28.1	28.1		36.1	36.1		36.1	36.1	
Total Split (s)	28.1	28.1		28.1	28.1		36.1	36.1		36.1	36.1	
Total Split (%)	43.8%	43.8%		43.8%	43.8%		56.2%	56.2%		56.2%	56.2%	
Maximum Green (s)	22.1	22.1		22.1	22.1		30.1	30.1		30.1	30.1	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		6.0			6.0			6.0			6.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Flash Dont Walk (s)	12.0	12.0		12.0	12.0		20.0	20.0		20.0	20.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		22.1			22.1			30.1			30.1	
Actuated g/C Ratio		0.34			0.34			0.47			0.47	
v/c Ratio		0.08			0.11			0.28			0.22	
Control Delay		11.0			12.1			11.2			10.9	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		11.0			12.1			11.2			10.9	

Lanes, Volumes, Timings
 1: Ridgeway Road & Rebstock Road

Future Total 2026AM Peak Hour
 04/30/2021



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS		B			B			B			B	
Approach Delay		11.0			12.1			11.2			10.9	
Approach LOS		B			B			B			B	

Intersection Summary

Area Type:	Other
Cycle Length:	64.2
Actuated Cycle Length:	64.2
Offset:	34 (53%), Referenced to phase 2: and 6:, Start of Green
Natural Cycle:	65
Control Type:	Pretimed
Maximum v/c Ratio:	0.28
Intersection Signal Delay:	11.2
Intersection LOS:	B
Intersection Capacity Utilization	29.5%
ICU Level of Service	A
Analysis Period (min)	15

Splits and Phases: 1: Ridgeway Road & Rebstock Road

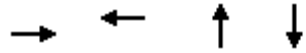


Queues

Future Total 2026AM Peak Hour

1: Ridgeway Road & Rebstock Road

04/30/2021



Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	43	61	226	174
v/c Ratio	0.08	0.11	0.28	0.22
Control Delay	11.0	12.1	11.2	10.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	11.0	12.1	11.2	10.9
Queue Length 50th (m)	2.2	3.5	14.8	11.3
Queue Length 95th (m)	7.9	10.4	27.3	21.6
Internal Link Dist (m)	98.7	430.8	170.6	206.0
Turn Bay Length (m)				
Base Capacity (vph)	556	540	802	797
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.08	0.11	0.28	0.22

Intersection Summary

HCM Signalized Intersection Capacity Analysis
 1: Ridgeway Road & Rebstock Road

Future Total 2026AM Peak Hour
 04/30/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (vph)	7	18	14	18	23	15	6	185	17	9	148	3
Future Volume (vph)	7	18	14	18	23	15	6	185	17	9	148	3
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.95			0.96			0.99			1.00	
Flt Protected		0.99			0.98			1.00			1.00	
Satd. Flow (prot)		1638			1646			1713			1726	
Flt Permitted		0.96			0.92			0.99			0.98	
Satd. Flow (perm)		1588			1540			1702			1699	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	8	20	15	20	25	16	7	201	18	10	161	3
RTOR Reduction (vph)	0	10	0	0	10	0	0	5	0	0	1	0
Lane Group Flow (vph)	0	33	0	0	51	0	0	221	0	0	173	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		8			8			4			4	
Permitted Phases	8			8			4			4		
Actuated Green, G (s)		22.1			22.1			30.1			30.1	
Effective Green, g (s)		22.1			22.1			30.1			30.1	
Actuated g/C Ratio		0.34			0.34			0.47			0.47	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Lane Grp Cap (vph)		546			530			797			796	
v/s Ratio Prot												
v/s Ratio Perm		0.02			0.03			0.13			0.10	
v/c Ratio		0.06			0.10			0.28			0.22	
Uniform Delay, d1		14.1			14.3			10.4			10.1	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.2			0.4			0.9			0.6	
Delay (s)		14.3			14.6			11.3			10.7	
Level of Service		B			B			B			B	
Approach Delay (s)		14.3			14.6			11.3			10.7	
Approach LOS		B			B			B			B	

Intersection Summary		
HCM 2000 Control Delay	11.7	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.20	B
Actuated Cycle Length (s)	64.2	Sum of lost time (s)
Intersection Capacity Utilization	29.5%	12.0
Analysis Period (min)	15	ICU Level of Service
c Critical Lane Group		A

Lanes, Volumes, Timings
2: Rebstock Road & Site Access

Future Total 2026AM Peak Hour
04/30/2021



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	8	34	35	7	21	22
Future Volume (vph)	8	34	35	7	21	22
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.977		0.931	
Flt Protected		0.990			0.976	
Satd. Flow (prot)	0	1717	1695	0	1576	0
Flt Permitted		0.990			0.976	
Satd. Flow (perm)	0	1717	1695	0	1576	0
Link Speed (k/h)		48	48		48	
Link Distance (m)		454.8	83.8		35.6	
Travel Time (s)		34.1	6.3		2.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	9	37	38	8	23	24
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	46	46	0	47	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.10	1.10	1.10	1.10	1.10	1.10
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	19.1%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis
2: Rebstock Road & Site Access

Future Total 2026AM Peak Hour
04/30/2021



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↖	↗		↘	
Traffic Volume (veh/h)	8	34	35	7	21	22
Future Volume (Veh/h)	8	34	35	7	21	22
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)	9	37	38	8	23	24
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	46				97	42
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	46				97	42
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				97	98
cM capacity (veh/h)	1562				897	1029
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	46	46	47			
Volume Left	9	0	23			
Volume Right	0	8	24			
cSH	1562	1700	960			
Volume to Capacity	0.01	0.03	0.05			
Queue Length 95th (m)	0.1	0.0	1.2			
Control Delay (s)	1.5	0.0	8.9			
Lane LOS	A		A			
Approach Delay (s)	1.5	0.0	8.9			
Approach LOS			A			
Intersection Summary						
Average Delay			3.5			
Intersection Capacity Utilization			19.1%	ICU Level of Service	A	
Analysis Period (min)			15			

Lanes, Volumes, Timings
3: Ridge Road South & Rebstock Road

Future Total 2026AM Peak Hour
04/30/2021



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	20	32	2	12	13	3	1	63	1	4	44	28
Future Volume (vph)	20	32	2	12	13	3	1	63	1	4	44	28
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.995			0.986			0.998			0.951	
Flt Protected		0.982			0.979			0.999			0.998	
Satd. Flow (prot)	0	1695	0	0	1675	0	0	1730	0	0	1646	0
Flt Permitted		0.982			0.979			0.999			0.998	
Satd. Flow (perm)	0	1695	0	0	1675	0	0	1730	0	0	1646	0
Link Speed (k/h)		48			48			48			48	
Link Distance (m)		83.8			111.6			142.4			290.0	
Travel Time (s)		6.3			8.4			10.7			21.8	
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
Adj. Flow (vph)	22	35	2	13	14	3	1	68	1	4	48	30
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	59	0	0	30	0	0	70	0	0	82	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	17.5%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis

3: Ridge Road South & Rebstock Road

Future Total 2026AM Peak Hour
04/30/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	20	32	2	12	13	3	1	63	1	4	44	28
Future Volume (Veh/h)	20	32	2	12	13	3	1	63	1	4	44	28
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			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)	22	35	2	13	14	3	1	68	1	4	48	30
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	17			37			176	123	36	156	122	16
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	17			37			176	123	36	156	122	16
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			100	91	100	99	94	97
cM capacity (veh/h)	1600			1574			715	751	1037	741	751	1064
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	59	30	70	82								
Volume Left	22	13	1	4								
Volume Right	2	3	1	30								
cSH	1600	1574	753	841								
Volume to Capacity	0.01	0.01	0.09	0.10								
Queue Length 95th (m)	0.3	0.2	2.3	2.5								
Control Delay (s)	2.8	3.2	10.3	9.7								
Lane LOS	A	A	B	A								
Approach Delay (s)	2.8	3.2	10.3	9.7								
Approach LOS			B	A								
Intersection Summary												
Average Delay			7.4									
Intersection Capacity Utilization			17.5%	ICU Level of Service	A							
Analysis Period (min)			15									

Lanes, Volumes, Timings
1: Ridgeway Road & Rebstock Road

Future Total 2026PM Peak Hour
04/30/2021



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	10	17	17	32	36	13	17	221	27	24	214	15
Future Volume (vph)	10	17	17	32	36	13	17	221	27	24	214	15
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.948			0.979			0.986			0.992	
Flt Protected		0.988			0.981			0.997			0.995	
Satd. Flow (prot)	0	1625	0	0	1666	0	0	1705	0	0	1712	0
Flt Permitted		0.943			0.888			0.973			0.954	
Satd. Flow (perm)	0	1551	0	0	1508	0	0	1664	0	0	1642	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		18			14			12			7	
Link Speed (k/h)		48			48			48			48	
Link Distance (m)		122.7			454.8			194.6			230.0	
Travel Time (s)		9.2			34.1			14.6			17.3	
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
Adj. Flow (vph)	11	18	18	35	39	14	18	240	29	26	233	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	47	0	0	88	0	0	287	0	0	275	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		8			8			4			4	
Permitted Phases	8			8			4			4		
Minimum Split (s)	28.1	28.1		28.1	28.1		36.1	36.1		36.1	36.1	
Total Split (s)	28.1	28.1		28.1	28.1		36.1	36.1		36.1	36.1	
Total Split (%)	43.8%	43.8%		43.8%	43.8%		56.2%	56.2%		56.2%	56.2%	
Maximum Green (s)	22.1	22.1		22.1	22.1		30.1	30.1		30.1	30.1	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		6.0			6.0			6.0			6.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Flash Dont Walk (s)	12.0	12.0		12.0	12.0		20.0	20.0		20.0	20.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		22.1			22.1			30.1			30.1	
Actuated g/C Ratio		0.34			0.34			0.47			0.47	
v/c Ratio		0.09			0.17			0.37			0.36	
Control Delay		10.7			13.8			12.1			12.2	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		10.7			13.8			12.1			12.2	

Lanes, Volumes, Timings
 1: Ridgeway Road & Rebstock Road

Future Total 2026PM Peak Hour
 04/30/2021



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS		B			B			B			B	
Approach Delay		10.7			13.8			12.1			12.2	
Approach LOS		B			B			B			B	

Intersection Summary

Area Type: Other

Cycle Length: 64.2

Actuated Cycle Length: 64.2

Offset: 34 (53%), Referenced to phase 2: and 6:, Start of Green

Natural Cycle: 65

Control Type: Pretimed

Maximum v/c Ratio: 0.37

Intersection Signal Delay: 12.3 Intersection LOS: B

Intersection Capacity Utilization 39.5% ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 1: Ridgeway Road & Rebstock Road

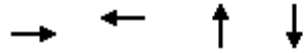


Queues

Future Total 2026PM Peak Hour

1: Ridgeway Road & Rebstock Road

04/30/2021



Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	47	88	287	275
v/c Ratio	0.09	0.17	0.37	0.36
Control Delay	10.7	13.8	12.1	12.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	10.7	13.8	12.1	12.2
Queue Length 50th (m)	2.3	5.9	19.6	19.0
Queue Length 95th (m)	8.2	14.6	35.0	34.0
Internal Link Dist (m)	98.7	430.8	170.6	206.0
Turn Bay Length (m)				
Base Capacity (vph)	545	528	786	773
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.09	0.17	0.37	0.36
Intersection Summary				

HCM Signalized Intersection Capacity Analysis
 1: Ridgeway Road & Rebstock Road

Future Total 2026PM Peak Hour
 04/30/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	10	17	17	32	36	13	17	221	27	24	214	15
Future Volume (vph)	10	17	17	32	36	13	17	221	27	24	214	15
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.95			0.98			0.99			0.99	
Flt Protected		0.99			0.98			1.00			1.00	
Satd. Flow (prot)		1626			1664			1706			1713	
Flt Permitted		0.94			0.89			0.97			0.95	
Satd. Flow (perm)		1551			1507			1665			1642	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	18	18	35	39	14	18	240	29	26	233	16
RTOR Reduction (vph)	0	12	0	0	9	0	0	6	0	0	4	0
Lane Group Flow (vph)	0	35	0	0	79	0	0	281	0	0	271	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		8			8			4			4	
Permitted Phases	8			8			4			4		
Actuated Green, G (s)		22.1			22.1			30.1			30.1	
Effective Green, g (s)		22.1			22.1			30.1			30.1	
Actuated g/C Ratio		0.34			0.34			0.47			0.47	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Lane Grp Cap (vph)		533			518			780			769	
v/s Ratio Prot												
v/s Ratio Perm		0.02			0.05			0.17			0.17	
v/c Ratio		0.07			0.15			0.36			0.35	
Uniform Delay, d1		14.1			14.6			10.9			10.9	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.2			0.6			1.3			1.3	
Delay (s)		14.4			15.2			12.2			12.1	
Level of Service		B			B			B			B	
Approach Delay (s)		14.4			15.2			12.2			12.1	
Approach LOS		B			B			B			B	

Intersection Summary		
HCM 2000 Control Delay	12.7	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.27	B
Actuated Cycle Length (s)	64.2	Sum of lost time (s)
Intersection Capacity Utilization	39.5%	12.0
Analysis Period (min)	15	ICU Level of Service
c Critical Lane Group		A

Lanes, Volumes, Timings
2: Rebstock Road & Site Access

Future Total 2026PM Peak Hour
04/30/2021



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↔		↘	↙
Traffic Volume (vph)	22	46	61	22	12	16
Future Volume (vph)	22	46	61	22	12	16
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.964		0.923	
Flt Protected		0.984			0.979	
Satd. Flow (prot)	0	1707	1672	0	1568	0
Flt Permitted		0.984			0.979	
Satd. Flow (perm)	0	1707	1672	0	1568	0
Link Speed (k/h)		48	48		48	
Link Distance (m)		454.8	83.8		35.6	
Travel Time (s)		34.1	6.3		2.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	24	50	66	24	13	17
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	74	90	0	30	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.10	1.10	1.10	1.10	1.10	1.10
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	20.6%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis
2: Rebstock Road & Site Access

Future Total 2026PM Peak Hour
04/30/2021



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Traffic Volume (veh/h)	22	46	61	22	12	16
Future Volume (Veh/h)	22	46	61	22	12	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)	24	50	66	24	13	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	90			176	78	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	90			176	78	
tC, single (s)	4.1			6.4	6.2	
tC, 2 stage (s)						
tF (s)	2.2			3.5	3.3	
p0 queue free %	98			98	98	
cM capacity (veh/h)	1505			801	983	
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	74	90	30			
Volume Left	24	0	13			
Volume Right	0	24	17			
cSH	1505	1700	895			
Volume to Capacity	0.02	0.05	0.03			
Queue Length 95th (m)	0.4	0.0	0.8			
Control Delay (s)	2.5	0.0	9.2			
Lane LOS	A		A			
Approach Delay (s)	2.5	0.0	9.2			
Approach LOS			A			
Intersection Summary						
Average Delay			2.4			
Intersection Capacity Utilization			20.6%	ICU Level of Service	A	
Analysis Period (min)			15			

Lanes, Volumes, Timings
3: Ridge Road South & Rebstock Road

Future Total 2026PM Peak Hour
04/30/2021



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	21	31	3	7	39	7	7	65	4	1	100	37
Future Volume (vph)	21	31	3	7	39	7	7	65	4	1	100	37
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.993			0.981			0.993			0.964	
Fl _t Protected		0.981			0.993			0.995				
Satd. Flow (prot)	0	1690	0	0	1690	0	0	1714	0	0	1672	0
Fl _t Permitted		0.981			0.993			0.995				
Satd. Flow (perm)	0	1690	0	0	1690	0	0	1714	0	0	1672	0
Link Speed (k/h)		48			48			48			48	
Link Distance (m)		83.8			111.6			142.4			290.0	
Travel Time (s)		6.3			8.4			10.7			21.8	
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
Adj. Flow (vph)	23	34	3	8	42	8	8	71	4	1	109	40
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	60	0	0	58	0	0	83	0	0	150	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	23.2%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
3: Ridge Road South & Rebstock Road

Future Total 2026PM Peak Hour
04/30/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	21	31	3	7	39	7	7	65	4	1	100	37
Future Volume (Veh/h)	21	31	3	7	39	7	7	65	4	1	100	37
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			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)	23	34	3	8	42	8	8	71	4	1	109	40
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	50			37			238	148	36	183	145	46
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	50			37			238	148	36	183	145	46
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			99	90	100	100	85	96
cM capacity (veh/h)	1557			1574			601	729	1037	707	732	1023
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	60	58	83	150								
Volume Left	23	8	8	1								
Volume Right	3	8	4	40								
cSH	1557	1574	725	792								
Volume to Capacity	0.01	0.01	0.11	0.19								
Queue Length 95th (m)	0.3	0.1	2.9	5.3								
Control Delay (s)	2.9	1.0	10.6	10.6								
Lane LOS	A	A	B	B								
Approach Delay (s)	2.9	1.0	10.6	10.6								
Approach LOS			B	B								
Intersection Summary												
Average Delay			7.7									
Intersection Capacity Utilization			23.2%		ICU Level of Service				A			
Analysis Period (min)			15									



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→ **The Power of Commitment**