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# Memorandum

| | | | |
|---|---|---|---|
| **To/Attention** | Alexander Orakwue, M.Eng, E.I.T<br>Project Manager, Land Development<br>Richcraft Homes<br>2280 St. Laurent Blvd. Suite 201<br>Ottawa, ON<br>K1G 4K1 | **Date** | January 31, 2022 |
| **From** | Ben Pascolo-Neveu, P.Eng. | **Project No** | 135709 |
| **Subject** | CRT Block 344 (620 Bobolink Ridge) - Transportation Memorandum | | |

## Introduction

IBI Group was retained by Richcraft Homes to prepare a Transportation Memorandum in support of a Site Plan Control (SPC) application to the City of Ottawa for a proposed mid-rise residential development at 620 Bobolink Ridge (referred to herein as 'CRT Block 344') within the Stittsville community of Ottawa.

IBI prepared a Transportation Letter in support of the Plan of Subdivision for CRT Phases 1 & 2 in 2011. Although the subject site was not explicitly accounted for in that transportation study, a review of the Transportation Impact Assessment (TIA) Screening Form indicated that the proposed development does not meet the TIA triggers and therefore does not require a separate TIA. Since the original Plan of Subdivision application, it is understood through email correspondence with you on January 17, 2022 that some transportation concerns have been raised through the Councillor's Office with regards to the SPC application for CRT Block 344 and therefore City staff requested the preparation of a memorandum/letter to address these specific concerns.

As such, the following items will be discussed as part of this Transportation Memorandum:

- Review potential for site access configuration on Cope Drive or Bobolink Ridge with respect to the City of Ottawa Private Approach By-law and a desktop sightline analysis.
- Estimate the total number of trips generated by the site based on the 2020 TRANS Trip Generation Summary Report and discuss whether this volume of traffic is appropriate for Embankment Street, a local road.
- Consider potential for parking spillover impacts from the proposed secondary school within the Westwood Subdivision on Embankment Street and any potential traffic operational concerns with respect to the proposed site access driveway locations.
- Review pedestrian circulation and connectivity to determine the need for a sidewalk on the east side of Embankment Street.
- Review capacity analysis for adjacent development TIAs to determine whether sufficient capacity exists for roundabout junctions on Robert Grant at Bobolink Ridge and Cope Drive to accommodate site-generated traffic.

## Proposed Development

The subject property is located within the Westwood Subdivision in Stittsville and proposes a total of 84 dwelling units equally divided amongst seven, 3.5-storey buildings. The site is approximately 1.6 hectares in size and is generally bound by Bobolink Ridge to the north, Robert Grant Avenue to the east, Cope Drive to the south and Embankment Street to the west. Single-family units are proposed between Embankment Street and the proposed development, with right-of-way protection to facilitate the inclusion of two all-movement site access driveways for the subject site. No additional vehicular connections are proposed with the other three boundary streets.

In terms of classification, Robert Grant Avenue is identified as an arterial, Cope Drive is a collector road, while Embankment Street and Bobolink Ridge are both local roads.

The proposed development concept plan has been provided in **Appendix A**.

## Site Access Configuration

*Question #1 - Can site access be provided from Cope and/or Bobolink? There is similar access provided on the east side of Robert Grant for low-rise apartment buildings, for example on Janka Private and Jatoba Private?*

Based on the 124 vehicular parking stalls proposed on-site and the site's proximity to both an arterial and major collector road, the Private Approach By-law 2003-447 indicates that a 30-metre separation distance is required between each driveway and an adjacent driveway, as well as the nearest streetline. Following these spacing requirements, a single site access driveway is feasible on Bobolink Ridge and Cope Drive, while two site access driveways are permitted on Embankment Street.

For comparison, the apartment block on Janka Private and Jatoba Private on the east side of Robert Grant Avenue provides a total of four (4) site access driveway connections with the adjacent road network including one on Bobolink, one on Cope and two on Shinny Avenue, a local road similar to Embankment Street. The number of access points to a development of this magnitude permits much greater dispersion of site-generated traffic but is not technically required from a traffic operations perspective and unnecessarily increases the number of conflict points for pedestrians and cyclists.

Given the low traffic generation associated with the proposed development, it is not necessary to provide more than two access driveways to accommodate site-generated traffic. Although the implementation of site access driveways on Bobolink Ridge and Cope Drive would comply with the Private Approach By-law, locations on these boundary streets would be within the area of influence of a roundabout and would establish additional vehicular conflict points with pedestrians and cyclists which could otherwise be avoided. Implementing both site access driveways on Embankment Street serves as a more suitable means of access for a development of this magnitude and is the primary function of a local road. It is important to note as well that a desktop review of sightlines on Embankment Street did not identify any significant horizontal or vertical constraints within close proximity to either proposed site access driveway. Further, these locations were already established through the Draft Plan of Subdivision approval process.

Based on the above, it is recommended that, from a traffic management and safety perspective, the site access configuration consist of the two driveway locations on Embankment Street, as indicated in the concept plan shown in **Appendix A**.

## Trip Generation

*Question #2 - What volume of traffic is expected from the 620 Bobolink development on Embankment Street? Has Embankment Street been designed handle this additional level of traffic safely?*

A trip generation exercise was undertaken, as presented below, and the results were compared against the 'livability' threshold for local roads from the TIA Guidelines, defined as 120 vehicles per hour or less.

### Trip Generation Methodology

Peak hour site-generated traffic volumes were developed using the 2020 TRANS Trip Generation Summary Report. The TRANS trip generation rates are based on a blended rate derived from 49 trip generation studies undertaken from 2008 to 2012, the ITE Trip Generation Manual (10th Edition) and the 2011 TRANS Origin-Destination (O-D) Travel Survey.

The TIA Guidelines recommend that the residential TRANS trip generation rates be converted to person-trips based on the rates detailed in the TRANS Trip Generation Summary Report. A peak period conversion factor was then applied to TRANS rates to translate peak period trips to peak hour trips.

Relevant extracts from the 2020 TRANS Trip Generation Summary Report are provided in **Appendix B**.

### Person Trip Generation

Site-generated trips were derived through the use of the recommended residential person-trip rates for weekday morning and afternoon peak periods, as presented for 'Multi-Unit (High-Rise)' uses in the 2020 TRANS Trip Generation Summary Report.

The resulting number of person-trips have been summarized in **Table 1** below.

Table 1 - Person-Trip Generation

| LAND USE | SIZE | TRIP RATE | PERIOD | PERSON TRIPS | | |
|---|---|---|---|---|---|---|
| | | | | IN | OUT | TOTAL |
| **PERSONS PER PERIOD (PPP)** | | | | | | |
| Multi-Unit (High-Rise)[1] | 84 units | T = 0.80*X | AM | 21 | 46 | 67 |
| | | T = 0.90*X | PM | 44 | 32 | 76 |

*Notes: [1] Defined as three storeys or more in the 2020 TRANS Trip Generation Summary Report.*

### Mode Share Proportions

The existing mode share for the Kanata/Stittsville Traffic Assessment Zone (TAZ) during weekday AM and PM peak periods were used to establish blended mode share targets for the subject site, as presented in **Table 4** below. A review of the existing mode share data indicates that approximately 25% of trips within the greater community are presently made by transit. The mode share rates are expected to be achieved as transit service is provided to meet the needs of the growing community. The non-motorized travel mode share includes both walking and cycling.

Table 2 – Existing Mode Share

| TRAVEL MODE | EXISTING MODE SHARE [1] | | BLENDED MODE SHARE TARGETS |
|---|---|---|---|
| | AM | PM | |
| Auto Driver | 43% | 55% | 49% |
| Auto Passenger | 26% | 19% | 22% |
| Transit | 28% | 21% | 25% |
| Non-Motorized | 4% | 5% | 4% |
| **Total** | **101%** | **100%** | **100%** |

Notes: [1] 2020 TRANS Trip Generation Summary Report

### Trip Generation by Mode

The blended mode targets, as presented in the preceding section, were applied to the development-generated person-trips to establish the number of trips per travel mode summarized in **Table 5** below. Factors to convert *peak period* to *peak hour* trips were applied to each travel mode in accordance with the TRANS Trip Generation Summary Report.

Table 3 – Peak Hour Person-Trips by Mode

| MODE | PEAK HOUR CONVERSION FACTORS (AM/PM) | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|
| | | IN | OUT | TOTAL | IN | OUT | TOTAL |
| Auto Driver | 0.48/0.44 | 5 | 11 | 16 | 9 | 7 | 16 |
| Auto Passenger | 0.48/0.44 | 2 | 5 | 7 | 4 | 3 | 7 |
| Transit | 0.55/0.47 | 3 | 6 | 9 | 5 | 4 | 9 |
| Non-Motorized | 0.58/0.48[1] | 0 | 1 | 1 | 1 | 1 | 2 |
| **Total Person-Trips** | 0.5/0.44 | 10 | 23 | 33 | 20 | 14 | 34 |

Notes: [1] Uses conversion factor for 'walking', as the cycling mode share is assumed to consist of less than 10% of these trips.

Based on **Table 5** above, the proposed development is expected to generate up to 16 new two-way vehicular trips during each of the weekday morning and afternoon peak hours. An increase in vehicular traffic of this magnitude can be considered negligible, especially when divided amongst the two proposed site access driveways and further dispersed between Bobolink Ridge to the north and Cope Drive to the south.

In terms of potential Neighbourhood Traffic Impacts, Embankment Street is classified as a local road and therefore has a 'livability' threshold of 120 vehicles per hour as specified in the TIA Guidelines. Given that there are approximately 38 single-family homes with direct access to Embankment Street, weekday peak hour traffic volumes along this street will be far below the prescribed threshold and therefore sufficient to accommodate traffic generated by the proposed development along this roadway.

## Spillover Parking

*Question #3 - Has the transportation analysis taken into account increased school traffic at the public high school site, and the impact on Embankment? Experience at other high schools is that there is a high amount of parking and kiss-and-ride on side streets near the school. Can Embankment function effectively with this additional traffic?*

It is understood that there are some concerns regarding the potential for spillover parking or pick-up/drop off activities from the proposed secondary school at 700 Cope Drive to occur within the segment of Embankment Street abutting the subject property.

A review of the OCDSB – Stittsville High School TIA (Parsons, 2019) indicates that this proposed institutional development will satisfy the Zoning By-law requirements in terms of both vehicular and bicycle parking with 118 and 180 stalls, respectively. The school will have a surplus of 58 vehicular parking spaces, should future portables be required to accommodate a larger student population in the longer-term. As such, it is not expected that additional on-street parking from the surrounding community will be required for the proposed high school development. The Transportation Demand Management (TDM) Measures Checklist included in Parsons' TIA indicated that designated pick-up/drop-off areas would be provided on-site for carpool motorists/parents which will mitigate the potential for any parking spillover within the adjacent community.

Given that the proposed school will provide sufficient parking, as well as a drop-off area, there is a significantly-reduced likelihood that such off-site activity would occur, particularly on Embankment Street, as there are other streets in closer proximity to the school. As indicated previously, the peak hour traffic on Embankment Street is expected to be well below the threshold of 120 vehicles per hour.

## Pedestrian Circulation & Connectivity

*Question #4 - Why isn't there a sidewalk planned for the east side of Embankment?*

Although there are no pedestrian facilities proposed on the east side of Embankment Street between Bobolink Ridge and Cope Drive, there are existing or planned concrete sidewalks on both sides of the remaining three boundary streets, all of which are more likely to be used by site-generated pedestrian trips, given the orientation and location of the buildings proposed on the subject property.

It is important to note as well that the specific locations of sidewalks within a subdivision are stipulated by the City of Ottawa as a condition of Draft Plan of Subdivision approval. At the time of subdivision approval, only select local roads contributing to the primary pedestrian network required sidewalks.

## Intersection Capacity Analysis

*Question #5 - Do the roundabouts on Robert Grant and Bobolink and Cope have sufficient capacity for the increasing development in the area?*

Subsequent to the trip generation conducted in response to Question #2 above, a review of recent adjacent development TIAs was undertaken to determine if additional capacity exists at the roundabouts of Robert Grant & Bobolink Ridge or Robert Grant & Cope to sufficiently accommodate the site-generated traffic. The intersection capacity analyses presented in the 1000 Robert Grant Avenue TIA (Parsons, 2020) and CRT Phase 3 TIA (IBI, 2021) indicate that both roundabouts abutting the subject development are expected to operate between Level of Service 'A' and 'C' during the weekday peak hours and well within acceptable standards (i.e. LOS 'D' or

better) beyond the 'Future (2028) Total' and 'Future (2030) Total' Traffic conditions for each study, respectively. The minor increase in site-generated traffic, equating to 16 vehicles for each weekday peak hour, will be easily accommodated on the adjacent road network with negligible impact.

Extracts of the intersection capacity analysis for both the Robert Grant & Cope and Robert Grant & Bobolink roundabouts are provided in **Appendix C**.

## Conclusion

Given that the proposed site access driveway locations on Embankment Street are compliant with the Private Approach By-law, the addition of site-generated traffic will not result in the exceedance of the 'livability' threshold for a local road and there are no visibility constraints associated with either location, the proposed site access driveways are deemed to be acceptable. Further, these site access driveway locations were provisioned for in the Draft Plan of Subdivision process.

The OCDSB – Stittsville High School TIA (Parsons, 2019) indicates that this institutional development plans to satisfy the Zoning By-law requirements in terms of both vehicular and bicycle parking with 118 and 180 stalls, respectively. The Transportation Demand Management (TDM) Measures Checklist included in that TIA indicated that designated pick-up/drop-off areas would be provided on-site for carpool motorists/parents which would further mitigate the potential for any parking spillover within the adjacent community. As such, vehicular parking demand or pick-up/drop-off activities from the proposed high school site are not expected to have any impact on Embankment Street.

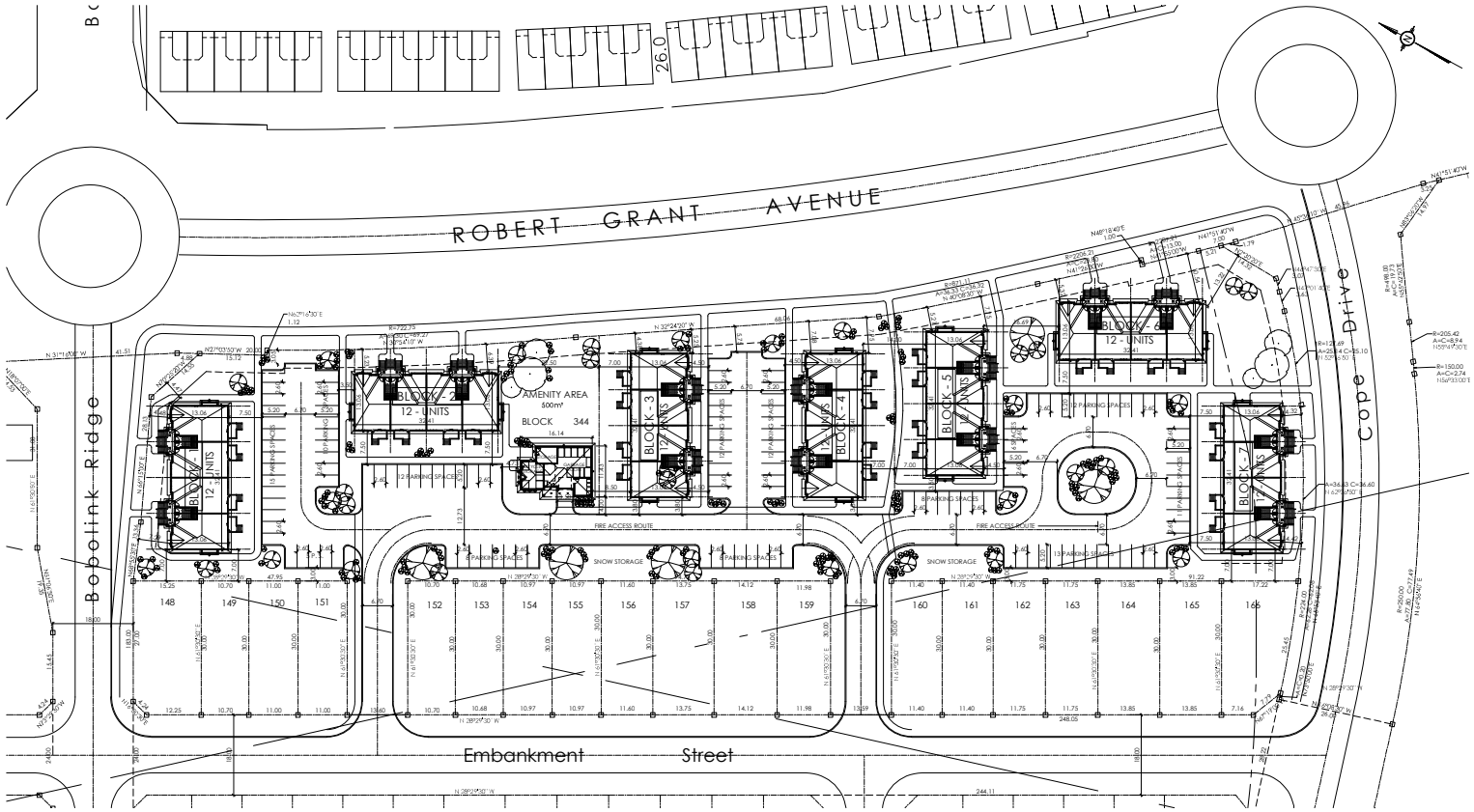
A review of intersection capacity analysis from recently conducted adjacent development TIAs indicated that the Bobolink and Cope roundabouts are expected to continue operating well within the respective capacity limitations (i.e. LOS 'D' or better) beyond the horizon year of each study. As such, the minor increase in site-generated traffic, which equates to 16 vehicles for each weekday peak hour, will be easily accommodated on the adjacent road network.

**Based on the findings of this study, it is the overall opinion of IBI Group that the proposed development will integrate well with and can be safely accommodated by the adjacent transportation network.**

Prepared By:


Ben Pascolo-Neveu, P.Eng.
Project Engineer

# Appendix A – Concept Plan




TERRACE FLATS :

| BLOCK No. : | | BUILDING AREA: | GROSS FLOOR AREA: | No. UNITS: |
|---|---|---|---|---|
| BLOCK 1 = | TERRACE FLATS | 412.0 m² | 1,219.0 m² | 12 UNITS |
| BLOCK 2 = | TERRACE FLATS | 412.0 m² | 1,219.0 m² | 12 UNITS |
| BLOCK 3 = | TERRACE FLATS | 412.0 m² | 1,219.0 m² | 12 UNITS |
| BLOCK 4 = | TERRACE FLATS | 412.0 m² | 1,219.0 m² | 12 UNITS |
| BLOCK 5 = | TERRACE FLATS | 412.0 m² | 1,219.0 m² | 12 UNITS |
| BLOCK 6 = | TERRACE FLATS | 412.0 m² | 1,219.0 m² | 12 UNITS |
| BLOCK 7 = | TERRACE FLATS | 412.0 m² | 1,219.0 m² | 12 UNITS |
| BICYCLE / GARBAGE = | | | | |
| TOTAL = | | 2,884.0 m² | 8,533.0 m² | 84 UNITS |

TERRACE FLATS PARKING :
PARKING REQUIRED : 1.2 Spaces / (84) d.u. + 0.2 / (84) d.u. (Visitor) = 100.8 + 16.8 = 117.6 Spaces
PARKING PROVIDED : 114 Spaces + 18 Visitor Spaces = 132 Spaces

BICYCLE PARKING REQUIRED : 84 (0.5 / (84) d.u.) = 42.0 Spaces
BICYCLE PARKING PROVIDED : 50 Interior Spaces

M. David Blakely
Architect Inc.
2200 Prince of Wales Dr. - Suite 101
Ottawa, Ontario K2E 6E9
Phone (613) 226-8811 Fax (613) 226-7942

GENERAL NOTES:
1. THE CONTRACTOR IS RESPONSIBLE FOR CHECKING AND VERIFYING ALL DIMENSIONS. ANY DISCREPANCY MUST BE REPORTED TO M. DAVID BLAKELY ARCHITECT INC.
2. ALL WORK AND MATERIALS TO BE IN COMPLIANCE WITH ALL CODES, REGULATIONS, AND BY-LAWS.
3. ADDITIONAL DRAWINGS MAY BE ISSUED FOR CLARIFICATION TO ASSIST THE PROPER EXECUTION OF WORK. SUCH DRAWINGS WILL HAVE THE SAME MEANING AND INTENT AS IF THEY WERE INCLUDED WITH THE PLANS IN CONTRACT DOCUMENTS.
4. DO NOT SCALE DRAWINGS.
5. THIS DRAWING SHALL NOT BE USED FOR PERMIT OR CONSTRUCTION UNLESS THE DRAWING BEARS THE ARCHITECT'S SEAL AND SIGNATURE.
6. THIS REPRODUCTION SHALL NOT BE ALTERED

CONSTRUCTION NORTH

SEAL

| No. | DATE | DESCRIPTION | INIT. |
|---|---|---|---|
| 10. | | | |
| 9. | | | |
| 8. | | | |
| 7. | | | |
| 6. | | | |
| 5. | | | |
| 4. | | | |
| 3. | | | |
| 2. | 28/07/20 | FOR REVIEW | SM |
| 1. | 10/07/20 | FOR REVIEW | SM |

REVISIONS

| No. | DATE | DESCRIPTION | INIT. |
|---|---|---|---|
| 20. | | | |
| 19. | | | |
| 18. | | | |
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| 11. | | | |

REVISIONS

PROJECT: 84 UNIT TERRACE FLATS KANATA BLOCK 344 OTTAWA, ONT.

CLIENT: RICHCRAFT Group Of Companies

DRAWING TITLE: CONCEPT SITE PLAN

DATE: JULY, 2020.
SCALE: 1:500
DRAWN BY: SBM
CHECKED: MDB
SHEET No.: SP-1

# Appendix B – Trip Generation Data

## 3.2 Recommended Residential Trip Generation Rates

A blended trip rate was developed from the three data sources through application of a rank-sum weighting process, considering the strengths and weaknesses of each dataset for the dwelling type in question. The recommended blended **residential person-trip rates** are presented in **Table 3**. All rates represent person-trips per dwelling unit and are to be applied to the **AM or PM peak period.**

**Table 3: Recommended Residential Person-trip Rates**

| ITE Land Use Code | Dwelling Unit Type | Period | Person-Trip Rate |
|---|---|---|---|
| 210 | Single-detached | AM | 2.05 |
| | | PM | 2.48 |
| 220 | Multi-Unit (Low-Rise) | AM | 1.35 |
| | | PM | 1.58 |
| 221 & 222 | Multi-Unit (High-Rise) | AM | 0.80 |
| | | PM | 0.90 |

## 3.3 Adjustment Factors – Peak Period to Peak Hour

The various trip generation data sources require some adjustment to standardize the data for developing robust blended trip rates. The peak period conversion factor in **Table 4** may be used where applicable to develop trip generation rate estimates in the desired format.

**Table 4: Adjustment Factors for Residential Trip Generation Rates**

| Factor | Application | Apply To | Period | Value |
|---|---|---|---|---|
| Peak Period Conversion Factor | **Peak period to peak hour conversion.** Because the 2020 TRANS Trip Generation Study reports trip generation rates by peak period, factors must be applied if the practitioner requires peak hour rates. In practice, the conversion to peak hour trip rates should occur **after** the application of modal shares. | Person-trip rates per peak period | AM | 0.50 |
| | | | PM | 0.44 |
| | | Vehicle trip rates per peak period | AM | 0.48 |
| | | | PM | 0.44 |
| | | Transit trip rates per peak period | AM | 0.55 |
| | | | PM | 0.47 |
| | | Cycling trip rates per peak period | AM | 0.58 |
| | | | PM | 0.48 |
| | | Walking trip rates per peak period | AM | 0.58 |
| | | | PM | 0.52 |

## Table 8: Residential Mode Share for High-Rise Multifamily Housing

| District | Period | Mode | | | | |
|---|---|---|---|---|---|---|
| | | Auto Driver | Auto Pass. | Transit | Cycling | Walking |
| Ottawa Centre | AM | 18% | 2% | 26% | 1% | 52% |
| | PM | 17% | 9% | 21% | 1% | 52% |
| Ottawa Inner Area | AM | 26% | 6% | 28% | 5% | 34% |
| | PM | 25% | 8% | 21% | 6% | 39% |
| Île de Hull | AM | 27% | 3% | 37% | 12% | 21% |
| | PM | 26% | 8% | 27% | 11% | 28% |
| Ottawa East | AM | 39% | 7% | 38% | 2% | 13% |
| | PM | 40% | 14% | 28% | 3% | 15% |
| Beacon Hill | AM | 48% | 9% | 30% | 3% | 10% |
| | PM | 52% | 16% | 28% | 0% | 4% |
| Alta Vista | AM | 38% | 12% | 42% | 2% | 7% |
| | PM | 45% | 16% | 28% | 2% | 9% |
| Hunt Club | AM | 39% | 6% | 44% | 1% | 9% |
| | PM | 44% | 11% | 35% | 2% | 9% |
| Merivale | AM | 41% | 6% | 42% | 2% | 8% |
| | PM | 41% | 11% | 33% | 2% | 13% |
| Ottawa West | AM | 28% | 11% | 41% | 3% | 16% |
| | PM | 33% | 11% | 26% | 7% | 23% |
| Bayshore/Cedarview | AM | 40% | 12% | 38% | 2% | 8% |
| | PM | 40% | 15% | 33% | 1% | 11% |
| Hull Périphérie | AM | 48% | 11% | 30% | 1% | 10% |
| | PM | 47% | 15% | 23% | 3% | 13% |
| Orleans | AM | 54% | 7% | 29% | 0% | 10% |
| | PM | 61% | 13% | 21% | 0% | 6% |
| South Gloucester / Leitrim | AM | 50% | 15% | 25% | 1% | 9% |
| | PM | 53% | 17% | 21% | 1% | 9% |
| South Nepean | AM | 58% | 6% | 30% | 2% | 4% |
| | PM | 54% | 15% | 25% | 0% | 7% |
| Kanata - Stittsville | AM | 43% | 26% | 28% | 0% | 4% |
| | PM | 55% | 19% | 21% | 0% | 5% |
| Plateau | AM | 53% | 9% | 35% | 3% | 1% |
| | PM | 65% | 7% | 25% | 2% | 1% |
| Aylmer | AM | 45% | 17% | 25% | 0% | 13% |
| | PM | 31% | 21% | 23% | 4% | 20% |
| Pointe Gatineau | AM | 44% | 15% | 24% | 3% | 14% |
| | PM | 52% | 15% | 20% | 2% | 11% |
| Gatineau Est | AM | 53% | 10% | 25% | 0% | 12% |
| | PM | 61% | 10% | 25% | 0% | 4% |
| Masson-Angers | AM | 63% | 15% | 19% | 0% | 3% |
| | PM | 64% | 18% | 16% | 0% | 1% |
| Other Rural Districts | AM | 63% | 15% | 19% | 0% | 3% |
| | PM | 64% | 18% | 16% | 0% | 1% |

# Appendix C – Intersection Capacity Analyses

**Table 13** below provides a summary of the critical Synchro analysis results at intersections within the study area, based on Future 2028 Total Projected traffic volumes.

Table 13: Future 2028 Total Projected Performance at Study Area Intersections

| Intersection | Weekday AM Peak (PM Peak) | | | | | |
|---|---|---|---|---|---|---|
| | Critical Movement | | | Intersection 'As a Whole' | | |
| | LOS | max. v/c or avg. delay (s) | Movement | Delay (s) | LOS | v/c |
| Fernbank/Robert Grant (S) | B(D) | 0.69(0.84) | WBT(WBT) | 21.8(27.4) | A(C) | 0.56(0.73) |
| Bobolink/Livery (U) | A(A) | 9.1(8.8) | SB(SB) | 5.0(4.8) | - | - |
| Bobolink/Robert Grant (R) | B(B) | 10.9(11.3) | WBL(EBL) | 6.1(6.2) | A(A) | - |
| Abbott/Robert Grant (R) | A(A) | 9.0(9.1) | NBL(NBL) | 6.0(6.2) | A(A) | - |

Note: Analysis of signalized intersections assumes a PHF of 1.00 and a saturation flow rate of 1800 veh/h/lane.
(S) – Signalized intersection.
(U) – Unsignalized intersection.
(R) – Roundabout intersection.

As shown in **Table 13**, the study area intersection 'as a whole' were shown to operate at a LOS 'C' or better during peak hours. The critical movements were shown to operate at a LOS 'D' or better during peak hours.

### MMLOS Analysis for Signalized Intersections

A Multi-Modal Level of Service (MMLOS) analysis was conducted at the signalized intersection of Fernbank/Robert Grant. Since no changes are anticipated at this intersection in future horizon years, the analysis was conducted for existing conditions. **Table 14** below provides a summary of the analysis results along with the respective targets provided in the City of Ottawa MMLOS Guidelines (Exhibit 22). The detailed MMLOS analysis sheet is provided in **Appendix I**. Red font indicates that the target LOS was not met.

Table 14: MMLOS Analysis at the Intersection of Fernbank/Robert Grant

| Signalized Intersection | Level of Service (LOS) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Pedestrian | | Bicycle | | Transit | | Truck | | Auto | |
| | PLOS | Target | BLOS | Target | TLOS | Target | TkLOS | Target | VLOS | Target |
| Fernbank / Robert Grant | B | C | F | C | E | D | E | E | D | D |

The target Levels of Service in **Table 14** are based on a General Urban Area with an arterial road classification, spine route designation, transit priority (isolated measures) designation and no truck route. At the intersection of Fernbank/Robert Grant, the pedestrian, truck and auto LOS met their respective targets. However, the bicycle and transit LOS do not meet their respective targets.

With regards to cyclists, although cycle tracks are currently provided along both sides of Robert Grant Ave and a multi-use pathway along the north side of Fernbank Rd, the intersection does not meet the target LOS due to the high operating speeds along both Fernbank Rd and Robert Grant Ave, as well as the lack of a dedicated bike lane on the south side of Fernbank Rd. It should be noted that, based on the TIA Guidelines, the paved shoulders on the south side of Fernbank Rd do not count as a substitute for a dedicated bike lane in an urban setting.

With regards to transit, the target LOS is not met due to high delays to the SBL movement during the afternoon peak hour period only.

# 5. CONCLUSIONS AND RECOMMENDATIONS

The general findings, conclusions and recommendations from the preceding traffic analysis has been summarized below.

#### *5.9.3.5 Future (2030) Total Traffic*

An intersection capacity analysis has been undertaken using the Future (2030) Total Traffic volumes presented previously in **Exhibit 10**.

The results of the intersection capacity analysis are summarized in **Table 20** below.

Table 20 - Intersection Capacity Analysis: Future (2030) Total Traffic

| INTERSECTION | TRAFFIC CONTROL | AM PEAK HOUR | | PM PEAK HOUR | |
|---|---|---|---|---|---|
| | | OVERALL LOS (V/C OR DELAY) | CRITICAL MOVEMENTS (V/C OR DELAY) | OVERALL LOS (V/C OR DELAY) | CRITICAL MOVEMENTS (V/C OR DELAY) |
| Fernbank Road & Robert Grant Avenue [1] | Signalized | C (0.71) | SBL (0.83) | D (0.83) | WBT (0.83) |
| Robert Grant Avenue & Cope Drive | Roundabout | C (16.1s) | NB (22.0s) | B (13.5s) | SB (16.3s) |
| Robert Grant Avenue & Haliburton Heights / Street 1 | Unsignalized | C (25.2s) | WBTRL (25.2s) | D (27.2s) | WBTRL (27.2s) |
| Fernbank Road & Goldhawk Drive | Unsignalized | C (19.8s) | SBRL (19.8s) | D (26.0s) | SBRL (26.0s) |

Notes: [1] Optimize traffic signals for PM Peak Hour

Based on the intersection capacity analysis shown in **Table 20** above, all study area intersections are anticipated to operate at an acceptable levels of service (i.e. LOS 'D' or better) under Future (2030) Total Traffic conditions.

#### *5.9.3.1 Fernbank Road & Shea Road*

As discussed previously, Parsons conducted a TIA for the 5969 Fernbank Road development in 2018, which includes the most refined analysis available for the recently-constructed roundabout at Fernbank & Shea. The results of the capacity analysis in Parsons' study indicate that by 2025 the roundabout configuration would be operating near or above its theoretical capacity (i.e. LOS 'E' or 'F') during the weekday peak hours, which was likely contributed to by an over-estimation of future background traffic through the application of a 3% growth rate. The Parsons TIA is inconsistent with adjacent development TIAs referenced in this study, which apply a 2% background growth rate in recognition of the capacity limitations at the Fernbank & Shea roundabout and account for dispersion of travel demand amongst other parallel routes such as Abbott Street and Hazeldean Road.

Further, the trip distribution developed for CRT Phase 3 assigns only 10% of site-generated traffic to Stittsville via this intersection, which translates to a 2-3% increase in critical east-west traffic volumes and in the opposing directions to peak flow. These contributions would therefore have a minimal impact on the overall operations of the roundabout and are unlikely to exacerbate any potential capacity issues.