



Ref. No. 151-11929 Phase 2

December 8, 2017

Ms. Ashley Blissett, P. Eng.  
Senior Development Engineer  
Halifax Regional Municipality  
PO Box 1749  
HALIFAX NS B3J 3A5

**RE: Addendum #2 Traffic Impact Analysis, Former Halifax West Site Development, Dutch Village Road, Halifax** (Case File #20901 - Memorandum Jody DeBaie to Ashley Blissett, P. Eng., June 20, 2017)

Dear Ms. Blissett:

Further to our telephone conversation on October 30, 2017, this Addendum has been prepared in response to HRM Traffic comments concerning the *Addendum Traffic Impact Analysis for the Revised 2015 Land Uses, Former Halifax West Site Development, Dutch Village Road, Halifax*, prepared by WSP during November, 2015.

**Background** - An Addendum Traffic Impact Analysis (TIA) was prepared in November, 2015, to consider and evaluate impacts of land use changes, including increasing the number of apartment units from 150 to 296, since the original Traffic Impact Study was prepared by WSP in December 2010. The Addendum included estimation of trips generated by the revised land uses, distribution of trips to the Dutch Village Road / Alma Crescent / Supreme Court intersection, and level of performance analyses using baseline intersection volumes obtained by HRM during mid-September, 2014.

**Response to HRM Comments** - A response to comments included in Memorandum from Jody DeBaie to Ashley Blissett, P. Eng., June 20, 2017, with regards to trip generation estimates for the apartment units, is included in the following paragraphs. Since the Memorandum indicated that *"The report appears to have been prepared in accordance with our guidelines."* the only request was for further comment on the trip generations for the apartment units. The June, 2017, Memorandum included the following three paragraphs of comments with regards to preparation of trip generation estimates for the 296 apartment units included in the 2015 Addendum TIA.

*"Trip generation estimates for the apartment units were calculated using the average rates for Land Use 223 (Mid Rise Apt.). This code was used in the initial TIS (2010). Land Use 223 has a data set equal to 7 studies with an average number of units equal to 120, which was appropriate for the previous study.*

*Since the number of apartment units has increased from 150 to 296, Land Use 220 (Apartment) may be more appropriate for estimating vehicle trips in the Addendum TIA. Land Use 220 has a larger data set available, and included an average number of dwelling units equal to 235 (AM) and 233 (PM), which is similar to the proposed number of units in this study.*

*The suggested land use code (220) will result in more vehicle trips exiting the site in the AM peak and more vehicle trips entering the site in the PM peak. Will the increased number of trips impact on the performance of the signalized intersection?"*

**Trip Generation Estimates for the Development** - Trip generation estimates have been prepared using published trip generation rates and equations from *Trip Generation, 9<sup>th</sup> Edition*, (Institute of Transportation Engineers (ITE), 2012). Trip generation estimates for 296 units (2015 TIA) prepared using average rates for Mid-Rise apartments, as well as for 290 units in the current development plan prepared using equations for three apartment land use types, are included in Table 1A.

As indicated in the Memorandum, the average number of units (120) used by ITE to provide rates and equations for Land Use 223 is significantly less than the 290 units now included in this development. However, use of equations for Land Use 220 is not appropriate for this location, since the large number of studies used in development of these equations included all apartment building types, including quadrplexes (four units). Since small buildings, such as those with four units, can be expected to include much higher auto ownership and possibly located in areas that may not have convenient access to transit, trip generation rates will be abnormally higher than would be appropriate for an area well served by transit.

High Rise (Land Use 222) equations which are based on a data set of 17 studies with an average of 420 units are considered more appropriate for use in estimating trip generation for the residential units at this location. While ITE defines High Rise apartments as buildings with more than ten levels (*Trip Generation, 9<sup>th</sup> Edition*, Page 373), the general public in HRM would usually consider buildings in the eight story range to be 'high rise', and vehicle usage in those buildings should be similar to ten story buildings.

| Table 1A - Trip Generation Comparisons 2015 and 2017 Proposed Apartment Land Uses   |                           |                                      |      |         |      |                              |     |         |     |
|---|---------------------------|--------------------------------------|------|---------|------|------------------------------|-----|---------|-----|
| Land Use <sup>1</sup>   | Number Units <sup>2</sup> | Trip Generation Rates <sup>1,3</sup> |      |         |      | Trips Generated <sup>3</sup> |     |         |     |
|   |                           | AM Peak                              |      | PM Peak |      | AM Peak                      |     | PM Peak |     |
|   |                           | In                                   | Out  | In      | Out  | In                           | Out | In      | Out |
| Trip Generation Estimates for the Proposed 296 Apartments (2015 Land Uses)  |                           |                                      |      |         |      |                              |     |         |     |
| Mid Rise Apt (Land Use 223)   | 296 Units                 | 0.09                                 | 0.21 | 0.23    | 0.16 | 27                           | 62  | 68      | 47  |
| Trip Generation Estimates for the Proposed 290 Apartments (2017 Land Use) - Various Rates and Equations   |                           |                                      |      |         |      |                              |     |         |     |
| Apartments (Land Use 220)   | 290 Units                 | Equations from Pages 334 and 335     |      |         |      | 29                           | 117 | 115     | 62  |
| Mid Rise Apt (Land Use 223)   | 290 Units                 | 0.09                                 | 0.21 | 0.23    | 0.16 | 26                           | 61  | 67      | 46  |
| Mid-Rise Apt (Land Use 223)   | 290 Units                 | Equations from Pages 387 and 388     |      |         |      | 33                           | 73  | 74      | 54  |
| High Rise Apts (Land Use 222)   | 290 Units                 | Equations from Pages 376 and 377     |      |         |      | 22                           | 66  | 64      | 41  |
| NOTES: 1. Trip generation rates and equations are for indicated Land Uses and Land Use Codes, <i>Trip Generation, 9<sup>th</sup> Edition</i> , Institute of Transportation Engineers, 2012.<br>2. Number of Apartment Units (296 units in 2015 and 290 in 2017)<br>3. Rates are 'vehicles per hour per unit'; trips generated are 'vehicles per hour for peak hours'. |                           |                                      |      |         |      |                              |     |         |     |

**Comparison of Trip Generation Estimates** - Table 2A includes comparison of trip generation estimates calculated using Land Use 223 rates for 296 apartments in the 2015 TIA to trip generation estimates calculated using Land Use 222 equations in the 2017 Addendum TIA.

It is estimated that the proposed 2017 residential land use with 290 apartment units will generate 88 two-way vehicle trips (22 entering and 66 exiting) during the AM peak hour and 105 two-way vehicle trips (64 entering and 41 exiting) during the PM peak hour.

Trip generation estimates for the 290 apartment units calculated using Land Use 222 equations include one less two-way trip during the AM peak hour and ten less two-way trips during the PM peak hour than estimates for 296 units using Land Use 223 average rates.

| Table 2A - Comparison of Trip Generation Estimates from 2015 TIA to 2017 Addendum TIA  |                           |     |       |                           |     |       |
|--|---------------------------|-----|-------|---------------------------|-----|-------|
| Scenario   | AM Peak Hour <sup>1</sup> |     |       | PM Peak Hour <sup>1</sup> |     |       |
|  | In                        | Out | 2-Way | In                        | Out | 2-Way |
| Trip Generation Estimates for the Proposed 296 Apartments (2015 Land Uses) - Land Use 223 Rates <sup>2</sup>   | 27                        | 62  | 89    | 68                        | 47  | 115   |
| Trip Generation Estimates for the Proposed 290 Apartments (2017 Land Use) - Land Use 222 Equations <sup>2</sup>  | 22                        | 66  | 88    | 64                        | 41  | 105   |
| Estimated Change in Trips from 2015 TIA to 2017 Addendum <sup>3</sup>  | -5                        | 4   | -1    | -4                        | -6  | -10   |
| Notes: 1. Trips generated are 'vehicles per hour for peak hours'.<br>2. Extracted from Table 1A, above.<br>3. These are the changes in trip generation estimates from those for 296 apartment units using average rates considered in the 2015 TIA, to trip estimates for 290 units using equations for High Rise Apartments (Land Use 222). |                           |     |       |                           |     |       |

### Conclusions -

1. Use of equations for Land Use 220 is not appropriate for this location, since the equations are based on all apartment building types, including four unit buildings. Including small building in the data base will result in abnormally high trip generation rates since those units are usually associated with higher auto ownership and are often located in areas that may not have convenient access to transit.
2. High Rise (Land Use 222) equations which are based on a data set of 17 studies with an average of 420 units are considered more appropriate for use in estimating trip generation for the residential units at this location.
3. Since the 290 proposed residential units considered in this Addendum are estimated to generate fewer trips than the 296 units considered in the 2015 Addendum, there will not be any change in the performance of the signalized intersection from that included in the 2015 Addendum, that is  
*"With relatively minor signal timing changes for the 2020 PM peak hour used in the performance evaluation, all intersection approaches are expected to operate well within HRM critical limits."*

If you have any questions, please contact me by Email to [ken.obrien@wsp.com](mailto:ken.obrien@wsp.com) or telephone 902-452-7747.

Sincerely:

Original Signed

Ken O'Brien, P. Eng.  
Senior Traffic Engineer  
WSP Canada Inc.

