June 21, 2017

Reference No.: 141-24579

Mr. Tyson Simms, MCIP, LPP
Planner II – Rural Policy and Applications
Current Planning | Planning and Development
P.O. Box 1749
Halifax, NS B3J 3A5

Re: Addendum to Traffic Impact Study:
Proposed 'Windgate Village' Mixed Use Development (WSP Canada Inc, March 2015)

Dear Mr. Simms,

Further to your meeting with Mike Connors on Wednesday, May 24th, WSP has prepared an Addendum to the to the Traffic Impact Study[1] completed in March 2015 for the proposed Windgate Village mixed use development in Beaver Bank, NS. The Addendum addresses the changes to the proposed development (site plan and land use) that have been proposed since the original submission, and further considers the proposed site access road from Windgate Drive.

ORIGINAL AND REVISED DEVELOPMENT CONCEPTS

The original and revised development concepts are summarized below:

- **Original Concept (Figure 1):** The original development concept included a mix of residential and commercial land uses. The south end of the parcel – located adjacent to Windgate Drive – included commercial developments, a mix of multi-unit and single family residential units, and a sports field / community park. The north end of the parcel, accessed via existing residential streets, comprised single family residential units only.

- **Revised Concept (Figure 2):** The revised development concept includes residential developments only; the commercial component has been eliminated. The south end of the parcel includes a mix of single family residential units and multi-unit apartment buildings. The north end of the parcel comprises single family residential units only.

[1] *Traffic Impact Study: Proposed 'Windgate Village' Mixed Use Development* (WSP Canada Inc, March 2015)

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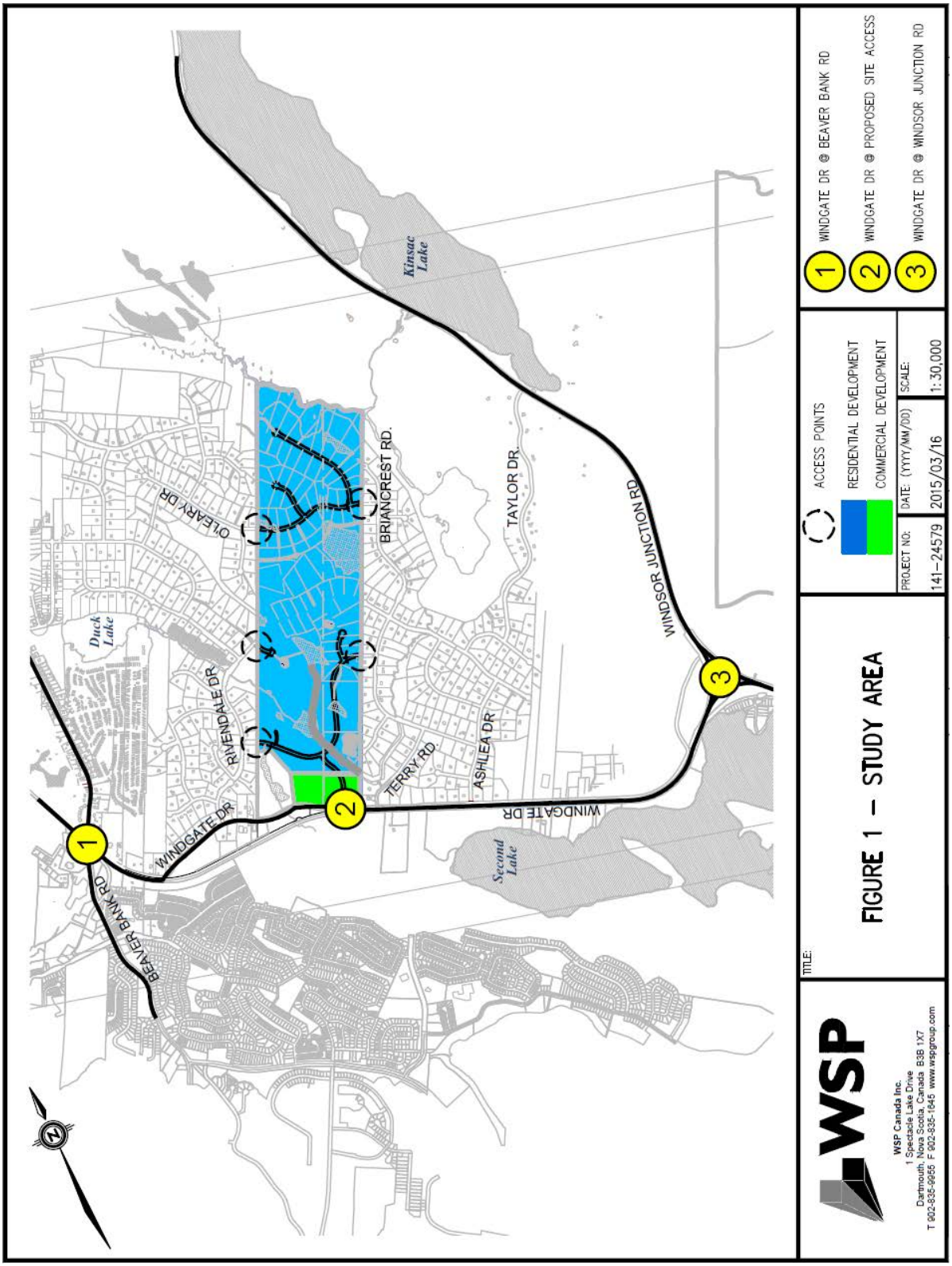


Figure 1: Original Concept Plan

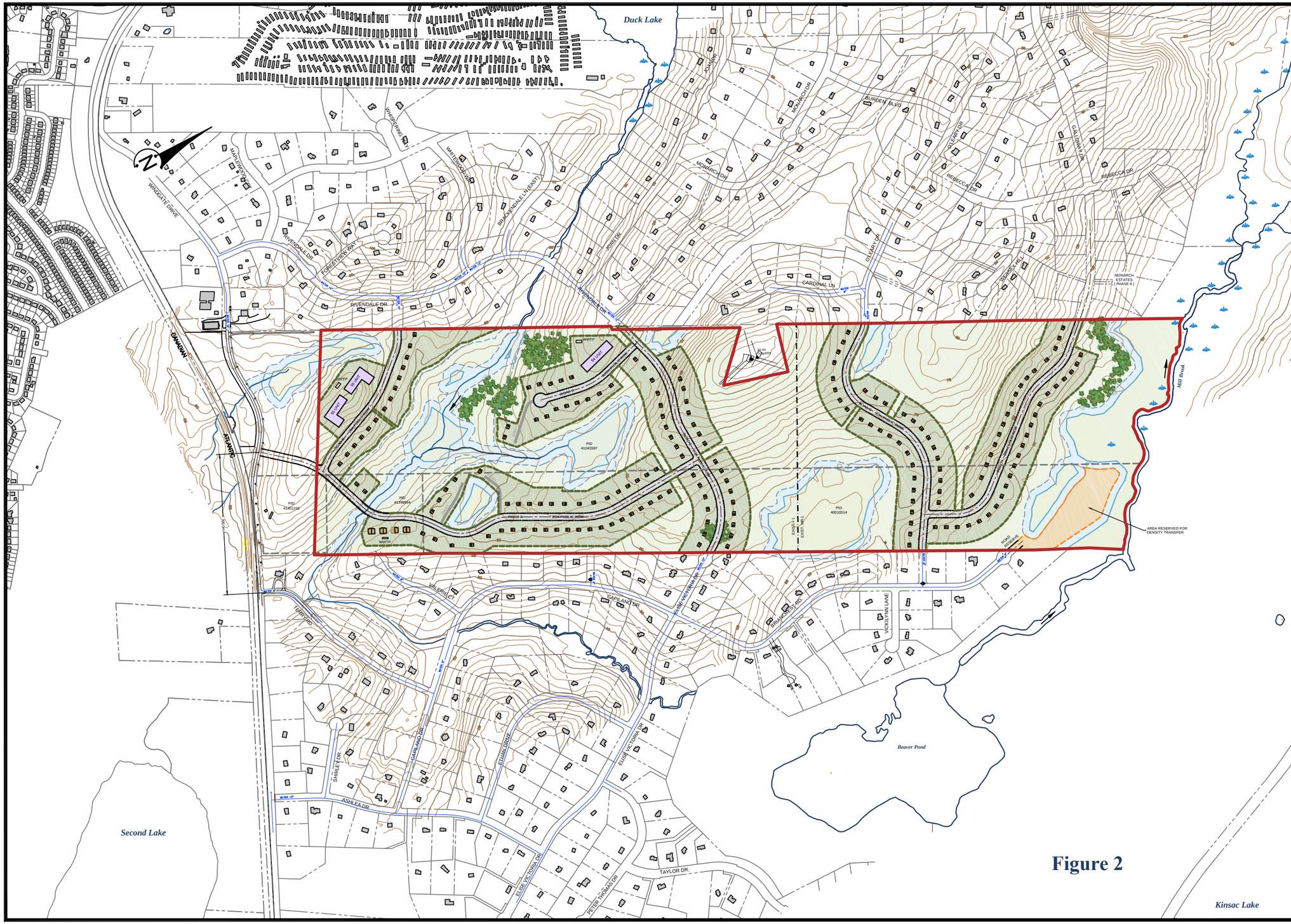


Figure 2

KEY PLAN

LEGEND

- Site Boundary (DA)
- Adjacent Property Boundary
- Zone Boundary Existing
- Right of Way Proposed
- 40% Developable Area 57.24 Ha (141.6 Ac.)
- Mature Trees to be Retained (Where Possible)

SITE SUMMARY:

- Land Area - 143.24 Ha (354.0 Ac.)
- 60% Open Space Area - 86.0 Ha (212.4 Ac.)
- Existing Zone - Mixed Industrial (I-1) / Mixed Resource (MR-1)
- Single Lots: 182
- Semi Detached: 8
- Multiunits: 164
- Total: 354

NOTES:

- Property lines approximate only. Site subject to survey
- Water line schematic from CKM Engineering Inc. 'Windgate Village' October 10, 2013

SOURCES:

- Service Nova Scotia and Municipal Relations Property Online
- Service Nova Scotia and Municipal Relations 1:10,000 digital topographic series
- Site Wetlands and Watercourses shown were delineated by Jeff Burrows of Terra Firma Consultants File: Windgate Drive_WETLANDS.dwg

Designer: KWATTERS
Planner: CWALLACE
VERSION 4.1

CLASSIC OPEN SPACE CONCEPT OPTION A
BEAVERBANK, NOVA SCOTIA

MARQUE INVESTMENTS LTD.

JUNE 20, 2017 141-24579100_V41

SCALE

75 50 25 0 150 m 300 m
1 : 5,000

1 SPECTACLE LAKE DRIVE, DARTMOUTH, NS, CANADA B3B 1X7
PHONE: 902 835-9955 - FAX: 902 835-1645 - WSP.COM

FILE: K:\DARTMOUTH\201\4141-24579-01 BEAVER BANK, STAGE 2 OPEN SPACE DESIGN\1_ DWG\11.1_CONCEPT_PLANS\141-24579100_V41.DWG Sheet:22-34_CONCEPT

Proposed land uses and access locations for both the original and revised development concepts are summarized in Table 1.

Table 1: Summary of Original and Revised Development Concepts

	Original Development Concept		Revised Development Concept	
	Access	**Proposed Land Uses**	**Access**	**Proposed Land Uses**
South	Windgate Drive Rivendale Drive Capilano Drive	**Residential:** • 46 Detached Single Family Units • 44 Townhouse Units • 120 Apartment Units **Commercial:** • 60,000 SF Specialty Retail	Windgate Drive Rivendale Drive Elise Victoria Drive	**Residential:** • 107 Detached Single Family Units • 8 Semi-detached Units • 164 Apartment Units
North	O'Leary Drive Briancrest Road	**Residential:** • 55 Detached Single Family Units	O'Leary Drive Briancrest Road Galloway Drive	**Residential:** • 75 Detached Single Family Units

Trip Generation Estimates

The number of trips that will be generated by the proposed development has been estimated using rates published in *Trip Generation, 9th Edition* (Washington, 2012). Trip generation estimates for the original and revised development concepts are which are summarized in Table 2 and described below:

- **Original Development Concept:** Trip generation estimates for the original development concept, as described in the March 2015 TIS, include a total of 251 two-way vehicle trips (85 vph entering and 166 vph exiting) during the AM peak hour and 381 two-way vehicle trips (211 vph entering and 170 vph exiting) during the PM peak hour.
- **Revised Development Concept:** Trip generation estimates for the revised development concept include a total of 225 two-way vehicle trips (52 vph entering and 173 vph exiting) during the AM peak hour and 292 two-way vehicle trips (185 vph entering and 107 vph exiting) during the PM peak hour.
- The revised development concept includes an overall reduction of approximately 26 two-way vehicle trips (33 fewer entering, 7 more exiting) during the AM peak hour and a reduction of 89 two-way vehicle trips (26 fewer entering, 63 fewer exiting) during the PM peak hour. .
- Changes in the number of trips generated with the new development concept are not expected to significantly affect intersection performance analysis results from the March 2015 TIS.

Table 2: Trip Generation Estimates for Proposed Development (Original and Revised Concepts)

	Land Use	Units[2]	Trip Generation Rates[1]				Trips Generated			
			AM Peak		PM Peak		AM Peak		PM Peak	
			In	Out	In	Out	In	Out	In	Out
Original Development Concept	**Trip Generation Estimates for Area 1 (Southern Portion)**									
	Single Family Residential (ITE Land Use Code 210)[3]	90	0.19	0.56	0.63	0.37	17	50	57	33
	Apartment (ITE Land Use Code 222)	120	0.10	0.41	0.40	0.22	12	49	48	26
	Specialty Retail[4] (ITE Land Use Code 826)	60	0.76	0.60	1.19	1.52	46	36	71	91
	Trip Generation Estimates for Area 1						75	135	176	150
	Trip Generation Estimates for Area 2 (Northern Portion)									
	Single Family Residential (ITE Land Use Code 210)[3]	55	0.19	0.56	0.63	0.37	10	31	35	20
	Total Trip Generation Estimates (Original Development Concept)						85	166	211	170
Revised Development Concept	**Trip Generation Estimates for Area 1 (Southern Portion)**									
	Single Family Residential (ITE Land Use Code 210)[3]	115	0.19	0.56	0.63	0.37	22	64	72	43
	Apartment (ITE Land Use Code 222)	164	0.10	0.41	0.40	0.22	16	67	66	36
	Trip Generation Estimates for Area 1						38	131	138	79
	Trip Generation Estimates for Area 2 (Northern Portion)									
	Single Family Residential (ITE Land Use Code 210)[3]	75	0.19	0.56	0.63	0.37	14	42	47	28
	Total Trip Generation Estimates (Revised Development Concept)						52	173	185	107
Summary	Total Trip Generation Estimates (Original Development Concept)						85	166	211	170
	Total Trip Generation Estimates (Revised Development Concept)						52	173	185	107
	Difference						**-33**	**7**	**-26**	**-63**

Notes:
1. Trip generation rates are 'vehicles per hour per unit' for Single Family Residential (Land Use Code 210), published in *Trip Generation, 9th Edition*, Institute of Transportation Engineers, 2012.
2. Residential units are dwellings. KGLA is 'Gross Leasable Area x 1000 square feet'.
3. The Single Family Residential (Land Use Code 210) has been used to estimate trip generation for townhouse and semi-detached units.
4. The Speciality Retail (Land Use 826) rate for 'Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 PM' has been used. Since there is no published rate for the AM peak hour of adjacent street for this Land Use, and since AM peak hour trips to Speciality Retail are generally low, AM trip rates have been assumed to be 50% of the PM rate with reversal of the directional split.

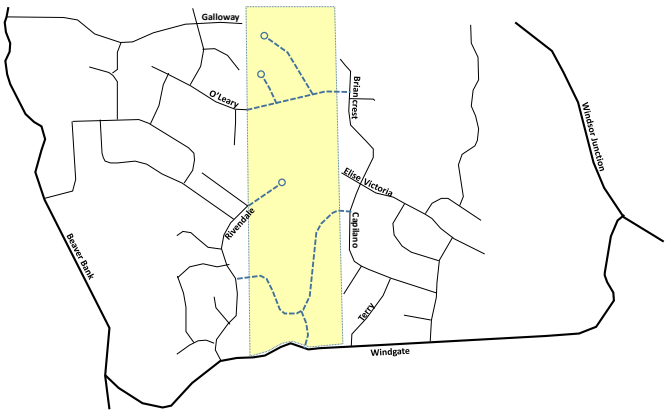
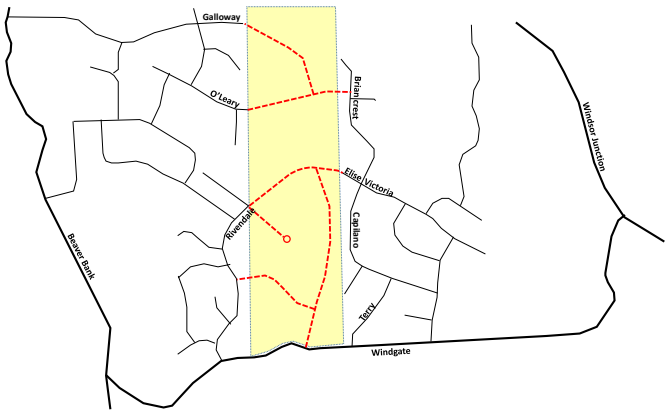
Road Network

The road network configurations for both concepts are illustrated in Table 2. Overall, the revised concept road network is similar functionally; however, it does include some notable modifications:

- The primary east-west road through the south end of the development, which in the original concept was a new road running between Rivendale Drive and Capilano Drive, is now a direct connection between the current limits of Rivendale Drive and Elise Victoria Drive.
- The access road to Windgate Drive, which is proposed just north of the previous location, is a more prominent north-south road through the south end of the development.
- The revised road network at the north end of the development includes a direct connection to Galloway Drive.

Since the road network in the revised development concept is similar functionally to that proposed in the original concept, it is expected that changes to traffic assignment relative to the original TIS will be negligible.

Table 3: Road Network – Original and Revised Development Concepts

ORIGINAL DEVELOPMENT CONCEPT ROAD NETWORK	REVISED DEVELOPMENT CONCEPT ROAD NETWORK
	

WINDGATE DRIVE ACCESS LOCATION

Access to the south end of the site was originally proposed via a new street connection to Windgate Drive located approximately 200m west of Terry Road, but the March 2015 TIS recommended that further investigation be completed to determine a final local for the intersection, as the proposed location did not meet minimum requirements for stopping sight distances (SSD) on the Windgate Drive approaches. A subsequent SSD investigation was completed during June 2017 to determine an acceptable intersection location. A location approximately 390m west of Terry Road (Photo 1 and Photo 2) was considered as an alternate site access location.

Photo 1: Looking left (east) from proposed site access location approximately 390m west of Terry Road

Photo 2: Looking right (west) from proposed site access location approximately 390m west of Terry Road

SSD – measured from a driver eye height of 1.05 m to a 150 mm object – were observed on the Windgate Drive eastbound and westbound approaches to the proposed intersection located approximately 390m west of Terry Road. Results of the SSD investigation are summarized below.

- SSD measurements recorded for the eastbound approach to the site access location indicate that with some tree clearing on the inside of the horizontal curve (Photo 3), over 150m of SSD is expected to be available, which exceeds the 140m required for an approach speed of 80km/h on a -1% (downhill) grade; and,
- SSD measurements recorded for the westbound approach to the site access location (Photo 4) indicate approximately 120m of available SSD, which is less than the 142m required for an approach speed of 80 km/h on a -2% (downhill) grade. However, it was observed that with tree clearing on the north side of Windgate Drive, over 150m of SSD is expected to be available.

Photo 3: Eastbound approach to proposed site access location. Note the trees obstructing sight lines on the right side of the photo.

Photo 4: Westbound approach to proposed site access location. Note the trees obstructing sight lines on the right side of the photo.

A site access location intersecting Windgate Drive approximately 390m west of Terry Road is expected to provide adequate SSD with tree clearing inside the horizontal curves for the Windgate Drive approaches. The sight lines for 150m on both approaches and locations where tree clearing is required are summarized in Figure 3. Available SSD at this location should be re-evaluated once trees have been cleared to confirm the intersection location.

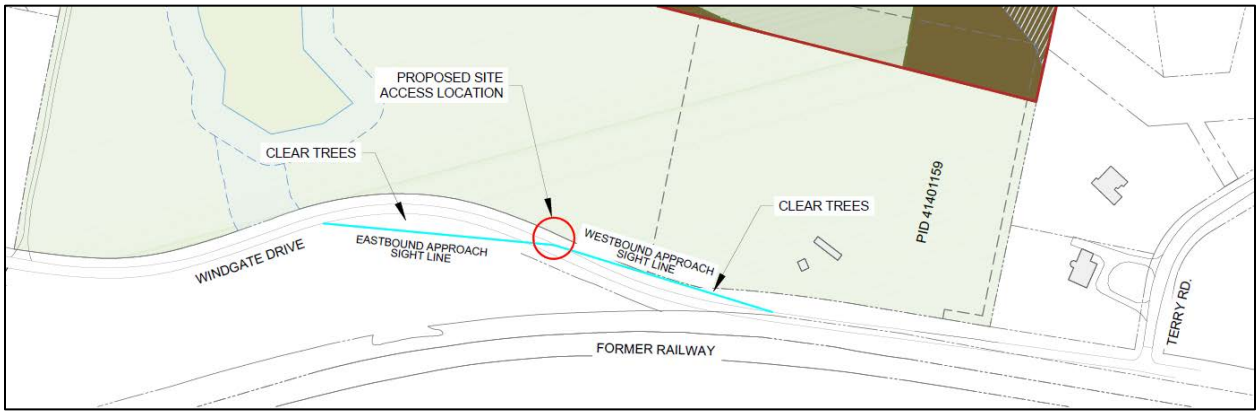


Figure 3: Sightlines at Proposed Site Access Location approximately 390m West of Terry Road

Summary

1. The proposed Windgate Village mixed use development in Beaver Bank, NS has undergone changes (site plan and land use) since WSP completed the *Traffic Impact Study* for the development in March 2015. This addendum has been completed to consider the proposed changes based on the resulting traffic impacts.
2. The revised development concept includes residential properties only; the 60,000 sq. ft. commercial component that was proposed for the south end of the site has been eliminated. Overall, the number of residential units has increased from 265 (145 detached / semi-detached units and 120 apartment units) to 354 (190 detached / semi-detached units and 164 apartment units).
3. Trip generation estimates for the revised development concept include a total of 225 two-way vehicle trips (52 vph entering and 173 vph exiting) during the AM peak hour and 292 two-way vehicle trips (185 vph entering and 107 vph exiting) during the PM peak hour. The revised development concept includes an overall reduction of approximately 26 two-way vehicle trips (33 fewer entering, 7 more exiting) during the AM peak hour and a reduction of 89 two-way vehicle trips (26 fewer entering, 63 fewer exiting) during the PM peak hour. The differences in trip generation estimates are not expected to significantly affect the results of the intersection performance analysis from the March 2015 TIS.
4. The road network within the development has been modified, including changes to the primary east-west road through the south end of the development and the location of connections to the surrounding road network. However, the revised road network remains similar functionally to that proposed in the original concept.
5. The location of the proposed access road to the south end of the development via Windgate Drive was further investigated in order to determine a location that meets stopping sight distance (SSD) requirements. An access location approximately 390m west of Terry Road is proposed provided that trees are cleared to improve sight lines on both the eastbound and westbound approaches.

Conclusion

Alterations to the Windgate Village development concept are not expected to produce trip generation changes that will significantly affect the performance of nearby intersections from the original TIS in 2015. Further investigation of the southern site access intersection location found that the site access road should be located approximately 390m west of Terry Road on Windgate Drive, but trees should be cleared on both approaches to improve sight lines. SSD measurements should be confirmed at these locations once the trees are cleared.

If you have any questions or comments, please contact me by email at greg.obrien@wsp.com or by telephone at 902-835-9955, extension 350.

Yours truly,

ORIGINAL SIGNED

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REGISTERED PROFESSIONAL ENGINEER
DATE June 21, 2017
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