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Memorandum

To/Attention	Shannon Noonan, City of Cambridge	Date	December 22, 2017
From	Don Drackley, IBI Group Scott Johnson, IBI Group	Project No	39984
cc	PTSL		
Subject	FINAL Cambridge West Community Transportation Impact Study Peer Review: Phase 1 and Phase 2 Technical Review		

1. Introduction

IBI Group was retained by the City of Cambridge in early 2017 to carry out a technical peer review of the Cambridge West Community Transportation Impact Study (TIS). This TIS was prepared by Paradigm Transportation Solutions Limited (PTSL) for the Cambridge West lands dated March 2017. PTSL was notified of this peer review.

Note that the March 2017 TIS is an update of the earlier October 2016 version reflecting City and Region reviews of that final draft report.

2. Peer Review Scope

The peer review process used for the Cambridge West Community TIS was somewhat more extensive than a traditional technical review of methodologies, and was conducted in two parts. Phase 1 was conducted in the spring of 2017 and includes a technical review of the TIS methodology, modelling approach, background growth assumptions and future horizon development scenarios. Phase 2 conducted in late 2017 includes a more detailed review, where needed, of the proposed road plan, Synchro traffic modeling and analysis, intersection control warrants and other more specific transportation issues.

IBI Group also prepared separate memos for the City addressing 40 transportation-related questions submitted by the public, plus a Frequently Asked Questions summary.

The March 2017 TIS was prepared for the subject property plans and development applications as they relate to the Cambridge West Transportation Network Assessment Study (September 2013), Master Environmental Servicing Plan (MESP 2014), Cambridge West Community Plan (October 2015) and the current Draft Plans of Subdivision (September 2017).

Peer review information is summarized in this Technical Memo as follows, and has been taken from the following technical memos and letters by IBI Group and PTSL:

- Memo Section 3: IBI Group Phase 1 Peer Review, June 15, 2017
- Memo Section 4: Peer Review Phase 2 Responses
 - PTSL Response October 6, 2017
 - IBI Group Response November 1, 2017

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- PTSL Response December 7, 2017
- PTSL Response December 8, 2017
- Memo Section 5: Additional Reviews
 - Whistle Bare Road Extension
 - CPR Rail Crossing
 - George Street North/Blair Road Roundabout Screening

3. Peer Review Phase 1, June 15, 2017

3.1 Summary

We identified the following five main comments associated with the March 2017 TIS prepared by PTSL that required further clarification and/or modification. Early responses from the Region and City are included

1. Additional commentary on queues and v/c ratios should be included in intersection operations assessments (sections e.g. 2.5.2, 3.5.3, 5.2.3, 6.1, 6.2, and 7). Commentary should include whether queues exceed available storage lengths. Mitigation discussion should include opportunities to lengthen storage bays.
2. Trip reductions for mode share and internal trip capture should be applied sequentially, not directly to the base trip rate. An internal trip capture of 80% and a modal split of 10% results in an 82% reduction. A sensitivity review and commentary on any potential changes to the final recommendations of the study should be provided.

In their memo dated April 28, 2017, Region of Waterloo staff responded that on this issue of trip reduction, the 10% transit mode share *“is acceptable for the development horizon year and in line with the RTMP recommendations.”* Also, they stated that the difference in the number of trips *“seems insignificant and may not impact the final recommendations of the TIS.”*

As noted in Section 4, PTSL corrected this error to the satisfaction of IBI Group, and this did not affect the TIS impact findings and conclusions.

3. Given the limitations of the surrounding road network, a sensitivity analysis should be provided to determine if different traffic growth or trip distributions would trigger a need for different improvements.

Region comments from their April 28, 2017 memo noted that since some intersections in the study area will experience poor level of service during 2031, they would like to review any sensitivity testing to confirm it does *“not raise any new Regional transportation issues.”*

4. We have not found reference to input from other stakeholders in the TIS or the planning and EA documents. Stakeholders include the CPR, Waterloo Region Police Services, Waterloo Region Paramedic Services, Cambridge Fire Department and school boards. Please advise whether such input will be provided, which may have some impact on the TIS.

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In response, the Draft Plans of Subdivision were reviewed by City and Region staff and no emergency response issues were raised.

5. The TIS should include some of the redevelopment projects in the downtown, in particular the Gaslight District. It is acknowledged that some of this information was not available at the time the TIS report was prepared, and therefore a report addendum with a brief commentary and limited analysis of critical intersections impacted will be sufficient.

Additional comments are provided in the following sub-sections.

3.2 Proposed Development

Based on the October 2016 TIS, the proposed Cambridge West development was planned as a mixed use residential subdivision, at that time consisting of 983 residential units, a school, and 53,000 ft² of commercial space. As part of the overall secondary plan, there are also 240 residential units nearby that were expected to be developed in a similar time frame, called the Freure Lands. This additional development was considered as part of the TIS, resulting in a total of about 1,225 units within the west city boundary.

The development will be served by several internal collectors, namely extensions of Bismark Drive and Newman Drive which will connect south to a realigned Blenheim Road, and north to Blair Road via the existing Bismark Drive and Newman Drive. Additional local residential streets will also connect to Blenheim Road and existing streets at the north end of the development.

As noted further in Section 4, the proposed development density and associated trip generation were revised in 2017 in response to requests from the City and Region that the development conform to the provincial density target. This resulted in the addition of about 350 more housing units to the proposed development.

3.3 Study Area

In total, the TIS examined 29 intersections in the surrounding areas. The study area was agreed upon by both the City of Cambridge and Region of Waterloo. Given the large scope of the study area, it appears to appropriately cover all impacted locations in terms of traffic operations.

3.4 Existing Conditions

The TIS presents three different sets of existing conditions analysis, one for roadway corridor capacities, one for intersection capacities, and finally a detailed review of Blenheim Road with respect to its function and capabilities.

3.4.1 Roadway Capacities Assessment

Roadway capacities presented in the TIS reference the 1999 Blair/Blenheim Area Traffic Study prepared by Stantec using the Highway Capacity Manual in effect at that time. The TIS (Section 2.4.1) states that “*traffic volumes on local streets in West Galt can comfortably accommodate 350-600 vehicles per lane per hour.*” This differs from Table 2.1 in the 1999 report that says only local streets such as Brant Road, Lansdowne Road and Salisbury Road have a planning capacity of 350 vehicles per lane per hour. Furthermore, the 1999 report says minor arterial streets such as Blenheim Road, Blair Road and Park Hill Road as classified in 1999 could accommodate 600-800 vehicles per lane per hour. Major arterial streets such as Water Street and Ainslie Street were stated to be able to accommodate 800-1000 vehicles per lane per hour,

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and finally, rural Regional Roads (arterial highways) such as Roseville Road west of Cambridge could accommodate 1000-1200 vehicles per lane per hour.

We agree with the general road capacities given the road classifications in the Cambridge Official Plan and Regional Transportation Master Plan today.

3.4.2 Intersection Capacity Assessment

The results show that all 29 analysed intersections are operating well today. However there are three specific intersection movements that are currently poor:

- Blair/George North northbound left and right turn at LOS E in the AM Peak Hour;
- Salisbury/George where the westbound left and right turns are LOF F in the PM Peak Hour; and
- Park Hill/Ainslie where the westbound movements are at LOS E in the PM Peak Hour.

We requested the Synchro models of that assessment in order to conduct our own review of the analysis. The assessment proved to be correct as reported.

It is unclear if the exhibits of intersection levels of service are only flagging movements with level of service E/F or are also inclusive of movements with a v/c ratio of 0.85 or greater for through movements and 0.90 or greater for turning movements as per the City's TIS guidelines.

Additional commentary on queues and v/c ratios should be included in intersection operations assessments (sections e.g. 2.5.2, 3.5.3, 5.2.3). Commentary should include whether queues exceed available storage lengths. Mitigation discussion (Section 6.2) should include opportunities to lengthen storage bays. An example for comment is the George Street South and Park Hill Road intersection, which is reported to operate at acceptable level-of-service yet has v/c ratio of 0.94 and queue lengths exceeding available storage (2031 p.m. conditions).

3.4.3 Blenheim Road Review

Section 2.6 of the TIS presents a discussion about Blenheim Road. The 1999 Blair/Blenheim Area Traffic Study is referenced which used a capacity of 600 vehicles per hour per lane for this roadway. The TIS also states that today, the Highway Capacity Manual (HCM) suggests an 800 vehicles per hour per lane capacity for a roadway of this type. The TIS should provide some mentions of the factors that can impact roadway capacity within the context of Blenheim Road such as the bus route along Blenheim Road, residential properties with driveways, traffic calming, and crossing pedestrians.

A site investigation by IBI Group during the a.m. peak hour revealed that eastbound left turning vehicles slow down through progression at the intersection of Blenheim Road and Blair Road. This is consistent with the provided traffic counts which show a large percentage of vehicles accessing Blair Road from Blenheim Road.

It is generally agreed that Blenheim Road currently operates at an acceptable level of service given the low volumes. However, the PTSL study comes to the conclusion that only a small 75 metre stretch is near critical levels whereas the rest of the corridor operates well. While this is true, the 75 metre stretch will be the limiting constraint in terms of traffic capacity and would impact the corridor upstream and downstream.

A review of collisions, roadway geometric characteristics and pedestrians was also provided. Given that there are no traffic concerns regarding these items, the information provided is adequate in providing additional context of the roadway.

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3.4.4 Other Phase 1 Findings

This peer review agrees with the findings that geometries / sight distances at the existing CPR crossing do not meet recommended guidelines. This peer review also agrees that a roundabout at Blenheim Road and Bismark Drive would provide a gateway feature and help reduce traffic speeds in the vicinity.

3.5 Trip Generation and Distribution

Trip generation for the proposed Cambridge West development utilizes the Institute of Transportation Engineers (ITE) Trip Generation Manual, based on land uses Code 210 single residential, Code 230 townhouse-condominium, Code 220 apartment, Code 520 elementary school and Code 820 shopping centre. These rates are appropriate for this type of development. The rates are determined based on surveyed traffic generation data that the ITE collects.

The study applies a trip reduction rate to account for mode share and internal trip capture on the ITE collected rates. This is a standard practice in Waterloo Region. Application of a 10% reduction for mode share indicates the development is expected to see higher non-auto usage compared with other sites used to develop the ITE rates. The transit mode share target in Regional Transportation Master Plan (RTMP-2010) is 15 % for this area. The Region confirmed that the rate used in the TIS (10%) is acceptable for the development horizon year and in line with the RTMP recommendations, however a brief commentary / justification should be provided

In terms of the internal trip capture rate, the provided rates of 80% for school and 30% for mixed use commercial appears reasonable given the location of the school and commercial areas. The pre-consultation form in Appendix A of the TIS appears to indicate that ITE internal capture reductions for mixed-use developments and pass-by rates were to be used. Please incorporate a statement and description into the TIS to confirm.

When developing site trips, it should also be noted that an internal capture rate of 80% (as shown for schools) plus a mode share of 10% does not result in a 90% reduction as shown on page 72 of the TIS. The two reductions should be applied sequentially, not additively. Applying consecutively to the school and the commercial component of this development will result in an additional 19 trips to the total of 740 trips in AM (2.5%) and an additional of 67 trips to a total of 919 trips in PM (7%). A sensitivity analysis and commentary of the additional traffic should be provided.

Trip distribution was based on Transportation Tomorrow Survey (TTS) observed travel patterns, which is generally the preferred approach for studies where the data is available. Trip assignments follow the proposed distributions. Given the sensitivity of the area, it may be prudent to develop an alternative distribution / sensitivity analysis to account for changes in the road network in the future. A sensitivity analysis should be considered to determine the capabilities of the road network to accommodate changes in travel patterns compared with existing 2011 TTS data. The sensitivity analysis may consider a 10% shift in traffic between the north and the east. This sensitivity analysis was subsequently conducted to our satisfaction by PTSL, and reported in their technical memo dated October 6, 2017.

3.6 Future Horizon Analysis

As per prior comments, critical movements appear to be assessed mainly via LOS and additional commentary on queues and v/c ratio should be provided.

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Traffic signal warrants are provided at appropriate locations.

It should be noted that in their April 28, 2017 review memo, the Region identifies the following intersections that are considered critical, and some movements will experience poor level of service during 2031 with the improvements scenario. Any changes to the traffic growth or trip distribution may lead to unacceptable operations or different mitigation measures.

- .
- Park Hill Road & Ainslie Street: EBL, NBTH, and NBR will operate at poor level of service E and close to capacity during 2031 AM peak hour. Proposed conversion to dual EBL will have geometric constraints (e.g. turn path / swing for heavy vehicles).
- Park Hill Road & George Street: SBL will operate at level of service E, close to capacity, and the back of queue will exceed 95m during 2031 PM peak hour.
- George Street & Salisbury Avenue: (unsignalized) WB will operate at level of service F during 2031 PM peak hour (signals are not warranted).
- Blair Road & George Street N: (unsignalized) NB will experience level of Service F and exceed the capacity during 2031 AM and PM peak hours (Signals are not warranted).
- Blair Street & George Street S: (unsignalized) SB and NB will operate at poor level of service F during PM peak hour (signals are not warranted).

It is requested that the TIS provide commentary of the above including consideration of a sensitivity analysis on traffic distribution.

Section 7 of the TIS provides an additional analysis of another development west of the proposed site and outside the City boundary. The assessment in Section 7 provides a sufficient level of detail to evaluate the level of impacts of the additional area.

4. Peer Review Phase 2 Responses

The objective of the Phase 2 Peer Review was to request and review further information and clarification from PTSL on the Phase 1 Peer Review findings. This input and IBI Group conclusions are summarized as follows.

PTSL RESPONSE	IBI GROUP CONCLUSION
<p>Changes in Density and Trip Generation:</p> <p>In a letter dated October 6, 2017 and included in the Appendix to this memo, PTSL responded to the Phase 1 Peer Review with a revised analysis of updated development density calculations. The original calculation of 1,223 housing units (including the Freure lands) was increased to 1,569 units in order to meet the Region and City requests for increased density to satisfy provincial growth policy.</p>	<p>The format of Table 1 does not match the format summarizing unit counts in the prior TIS. Can a summary of the high and low, and selected scenarios, be provided including differences. A graphic or map showing where the changes were made would be useful. This information was provided by PTSL on December 7, 2017 to the satisfaction of IBI Group.</p>
<p>Trip Generation Calculations:</p> <p>PTSL acknowledged an error made in their calculation of the trip generation reduction of 10% owing to Transportation Demand Management (i.e. transit use). The error was corrected and did not affect the</p>	<p>IBI Group is satisfied with the corrections made.</p>

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<p>transportation impact conclusions.</p>	
<p>Revised Trip Generation: Taking into account the previously noted trip generation correction, trip generation in the AM peak hour increased by 20%, and by 23% in the PM peak hour.</p>	<p>This increase is acknowledged by IBI Group as correct.</p>
<p>Sensitivity Analysis: One important recommendation from the IBI Group Peer Review was to conduct a sensitivity analysis to determine the impact of a different, higher trip generation from the planned development. PTSL and IBI Group agreed that 10% more trips be assessed to/from the east reflecting more commuting to the GTA in the morning. A second sensitivity test was conducted with 10% more trips to/from the west.</p>	<p>The allocation of the increased trip generation east and west of the planned development is considered reasonable. The highest proportion of the 10% increase to the east went to Water Street North (8.1%). To the west, 5% was reallocated to Roseville Road West and 5% to Dickie Settlement Road North.</p>
<p>Background Growth Assumptions: PTSL’s October 6, 2017 response letter provides a brief assessment of implications of alternative background growth rates, and implications of the Gaslight District. The letter identifies that the difference between modelled and updated background growth could be described as a shortfall of 382 residents in the downtown that were not accounted for owing to the timing of the TIS compared to recent projects such as the Gaslight District.</p>	<p>Generally this summary adequately shows that additional background growth from known downtown Cambridge development projects is not likely to have a major effect on the Cambridge West traffic study. For example, given the location of the Gaslight development between the Main Street and Cedar/Concession Street bridges, river crossings from the Gaslight development are expected to be served by these two bridges, which are forecast to have excess capacity as noted in the TIS.</p> <p>Furthermore, additional background traffic forecasting by IBI Group in downtown Cambridge conducted for the City’s Transportation Master Plan shows poor level of service at the Park Hill/Ainslie and Water/Concession intersections in the AM peak hour, and at the Main/Wellington, George S/Cedar, Water/Concession and Ainslie/Concession in the PM peak hour. While these forecasted problem areas occur only in the PM peak hour, their impact on the downtown Cambridge roadway network is attributed to more than the Cambridge West development, and is being addressed in the Transportation Master Plan.</p>
<p>Analysis of the 2031 Horizon Operations – Median Density Scenario An analysis of the 2031 Total Horizon was done using the “median” new Cambridge West residential unit forecasts and the additional background trips previously discussed. This analysis focuses on intersections identified by IBI Group. These identified intersections showed some movements of concern as</p>	<p>PTSL provided a commentary on the impacts of the changes on an intersection-by intersection basis. Generally the analysis is found to be adequate. However, the all-way stop-controlled intersection of Blair Road and George Street South is now operating quite poorly, as v/c ratios have increased significantly</p>

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<p>outlined in the original TIS, and now include:</p> <ol style="list-style-type: none"> 1. <input type="checkbox"/> Blair Road and George Street (North); 2. <input type="checkbox"/> Park Hill Road and George Street; 3. <input type="checkbox"/> Park Hill Road and Water Street; 4. <input type="checkbox"/> Park Hill Road and Ainslie Street; 5. <input type="checkbox"/> Blair Road and George Street (South); 6. <input type="checkbox"/> George Street and Salisbury Avenue; and 7. <input type="checkbox"/> Blenheim Road and Blair Road. 	<p>for the southbound approach in the p.m. peak hour. PTSL has been requested to provide an updated traffic signal warrant and assess potential for other changes to this intersection, or to the network that could improve operations at this location.</p> <p>IBI Group concurs with PTSL recommendations for the other six intersections analyzed. Specific attention should be paid to the northbound and southbound movements at the intersection of Blair Road and George Street North which is forecast to operate poorly (LOS F) in the TIS, and the revised trip generation does not improve the operations. A traffic signal would improve delays at this intersection, however a signal is still not warranted according to the justification calculations in Ontario Traffic Manual Book 12, as supported by the Region of Waterloo. The TIS recommends that the Region continue to monitor the need for signalization every five years. This recommendation could be less than every five years depending on the pace of Cambridge West development. Signalization or an alternative roundabout should be implemented when warranted.</p> <p>IBI Group also supports improvement at the Park Hill Road/Ainslie Street intersection with double eastbound left turn and through/right turn lanes recommended by PTSL.</p>
<p>Link Based Assessment of Blenheim Road</p> <p>A link-based assessment of Blenheim Road is included in the TIS (Section 5.2.1). The analysis was updated with the volumes forecast by PTSL in their October 6, 2017 letter for the median density scenario for the 2031 total horizon.</p>	<p>The updated peak forecasted traffic volumes on Blenheim Road do not exceed the 800 vehicles per hour capacity limit for a major collector road. Only the section immediately east of Lansdowne Road is close to approaching this threshold (754) during the PM peak hour. Other forecasted link volumes on Blenheim Road fall well below the 600 – 800 vehicles per lane per hour threshold.</p> <p>Peak hour, peak direction volumes on Blair Road are approximately 515 north of Princess Street, also well below the 600 – 800 vehicles per lane per hour threshold. However, in both cases on the Blenheim Road and Blair Roads links, the Region and City will need to monitor changes in traffic volumes as the Cambridge West development grows to ensure adequate link capacity is being maintained.</p>
<p>Bridge Capacity Analysis:</p> <p>As the trips from the Cambridge West development were assigned only to the Park Hill Road bridge, the impacts of the sensitivity analyses were limited to that location. The sensitivity tests impact the forecast</p>	<p>PTSL notes that the Park Hill Road bridge will operate at a v/c ratio of 0.97 as opposed to 0.90 previously forecast. This is obviously reaching capacity of that bridge. This should be a concern</p>

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<p>volumes by approximately +/- 2 to 3% for the westbound direction during the PM peak hour. The volume to capacity ratio of the Park Hill Road bridge for the westbound direction accounting for the new trip forecasts from the revised densities and assuming the original distribution was forecast to be 94%. With 10% more traffic added to the east from the sensitivity test, the volume to capacity ratio is forecast to be 97%. This is an increase from the usage of 90% from the original analysis in the TIS, but still within capacity.</p> <p>Additionally, when assuming the Park Hill bridge together with the other two bridges, the volume to capacity ratio of all bridge crossings for that peak hour with the extra 10% distribution to/from the east is forecast to be 67% (an increase from 64% from the original analysis in the TIS),</p> <p>This indicates that drivers will have opportunities to plan routes to use other bridges. The volume to capacity ratio forecast for the Park Hill bridge does not account for any redistribution of trips to the other two bridges. Therefore, the increased density and the sensitivity analysis with the shift of 10% of the traffic to/from the east would have negligible impact on the bridge crossings.</p>	<p>that will need to be resolved through access planning to the other two bridges at Main Street and Cedar/Concession Street. This also needs to consider impacts of drivers seeking other these river crossing opportunities.</p> <p>The PTSL response provides adequate commentary on availability of capacity on these alternative bridges, but not on associated access routes.</p>
<p>Queuing Analysis:</p> <p>IBI Group asked PTSL to provide more information on required queue lengths, specifically any need to extend turn bays or limitations to do so be addressed in the TIS.</p> <p>In their December 8, 2017 letter response, PTSL reported that the 95th percentile queues for each analyzed intersection were omitted from the main body of the TIS report due to the number of intersections studied (29). The 95th percentile queues were included as part of the Synchro reports contained within their Appendices.</p>	<p>IBI Group agrees with the PTSL analysis that at the signalized intersections of Park Hill Road and Water Street, and of Park Hill Road and Ainslie Street, queuing will continue to be an issue due to the relatively short proximity of the intersections. We also agree with their recommendation to improve the Ainslie Street intersection with double left turn and through right turn lanes.</p> <p>At the forecasted northbound queue on Blair Road at George Street North of 189.0 metres and 86.4 metres during the AM and PM peak hours without signalized control, we support improvement to this intersection. Separating the northbound movements into two separate left turn and right turn lanes appears possible by reconstructing and enlarging the intersection based on existing property and land use at the south leg of the intersection. The distance to the next intersection (Princess Street) is approximately 160 metres, which would mean that the 95th percentile queue could reach this intersection during the AM peak hour if an exclusive left turn lane is not provided in the future. As recommended by PTSL, this intersection requires further monitoring.</p>

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<p>PTSL Peer Review Conclusions:</p> <p>The revised trip generation forecast, resulting from the requested increase in density and calculation correction of the reduction factors, is forecast to be able to be accommodated similarly to what was previously reported in the TIS.</p>	<p>While IBI Group agrees with this general conclusion, it is also noted that expected traffic growth at a number of specific locations should be planned. Each will require further monitoring, study and operational improvements once forecasted background and development traffic growth approach warranted conditions. These intersections include the Park Hill Road/Ainslie Street and Water Street intersections, Blair Road/George Street South, Blair Road/George Street North and Blenheim Road approaching Blair Road.</p>
<p>A sensitivity analysis indicates that a redistribution of the traffic generated of 10% to/from the east or the west by the Cambridge West development will have negligible impact on the downtown intersections.</p>	<p>Considering that PTSL's sensitivity analysis shows fair/poor LOS E and F at some downtown intersection approaches by the 2031 horizon (i.e. Park Hill/Ainslie, Blair Road/George South), IBI Group does not view these as negligible impacts and recommends they should be reported as such in the Final TIS with corresponding mitigation plans where required. .</p>
<p>The Region of Waterloo's transportation demand forecasts indicate that population growth was slightly underestimated compared to more current growth statistics. An estimate of the trips this underestimate could represent was created and included in the revised analysis.</p>	<p>IBI Group agrees with this conclusion and associated analysis.</p>
<p>Taking into account the revised growth forecasts, the sensitivity analysis requested by the peer reviewer, and the additional background trips, the conclusions and recommendations of the TIS remain unchanged.</p>	<p>While the TIS conclusions remain unchanged, deteriorated LOS operations are still noted at a number of locations, and further monitoring, study and operation improvements are expected. As a result, we do not view the March 2017 TIS to be the final document owing to the updates and additional assessments added to the TIS since 2016. We recommend that this additional information be included in the Final TIS, including recommendations on how the City and Region can proceed with outstanding subjects such as signal and roundabout warranting within the study area.</p> <p>The Final TIS should also include the three additional subjects discussed below involving a Whistle Bare extension option, CPR crossing and George Street N/Blair Road intersection and roundabout warrant screening.</p> <p>This Final TIS should be completed as a condition of draft plan of subdivision approval to the satisfaction of the City.</p>

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5. Additional Peer Reviews

5.1 Whistle Bare Road Extension

The report by MacNaughton Hermsen Britton Clarkson Planning Ltd. and others dated September 2017 regarding a possible Whistle Bare Road extension is a compilation of technical information in response to a proposal by some members of the public to alter the approved collector road network for the planned Cambridge West community as follows:

- Extend Whistle Bare Road easterly into the development area; and
- Extend the planned internal road network north of the development area to intersect with Blair Road at two alternative locations.

The report evaluates these suggested collector road network changes in terms of surrounding community input from the Neighbourhood Protection Association, various related correspondence from individual residents and the RARE Charitable Research Reserve, and planning policies relating to the affected lands. Technical evaluations are also included on natural heritage, road network impacts including servicing, utilities, noise, road design and costs, and traffic impacts. IBI Group's review of this report concludes as follows:

Planning Policy – The report identifies ten (10) findings where the suggested alternative road extensions do not comply with the Regional Official Plan and Places to Grow Growth Plan in terms of impacts on the Agricultural Land Base, Core Environmental Features, Natural Heritage System, Blair-Bechtel-Cruickston Environmentally Sensitive Landscape and the RARE Charitable Research Reserve who are strongly opposed to any alternative road alignment that would impact the Reserve.

Engineering Design – Eight (8) conditions are identified where the alternative road alignments would not comply with engineering design standards and/or would result in added servicing costs.

Transportation – Five (5) issues relate to the lack of need for the alternative road extensions in the network, their limited ability to divert future development-related traffic away from existing neighbourhoods to the north and east and a negligible reduction of traffic volumes on Blenheim Road.

Based on these findings, the report recommends that the alternative collector road extensions to the west and north of the Cambridge West community be again screened out from further consideration, as they were previously screened out in the approved Cambridge West Master Environmental Servicing Plan in 2014. Based on the study findings, IBI Group strongly agrees with this recommendation.

5.2 CPR Rail Crossing

IBI Group was asked to provide comment on whether grade separation of Blenheim Road at the CPR mainline crossing is warranted based on the established rail grade separation formula.

The rail grade separation warranting formula compares train volume to traffic crossing volume. As a rule of thumb, if the resulting Road Exposure Index threshold is 200,000 or greater, then grade separation may be considered. However, being a rule of thumb, this does not automatically mean that grade separation is required. There are many examples across Ontario and Canada where this threshold is met but grade separation is not provided for various reasons. The threshold is only a trigger for starting the conversation about grade separation.

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PTSL provided a forecasted AADT on Blenheim Road between Parkwood Drive the new Street “H” by 2031 of 8,800 vehicles crossing the rail line. With between 15 and 20 trains crossing a day, the crossing exposure index of 200,000 is not met.

Also, given the cost implications of constructing a grade-separated railway crossing, there would have to be a thorough cost-benefit analysis conducted before any conclusions could be made about what form of crossing would be appropriate on the basis of construction and maintenance, safety, delays and environmental impacts. Since the forecasts AADT volume does not exceed the Exposure threshold, then exploring grade separation is not needed. This does not negate the need for appropriate at-grade crossing protections being provided.

We understand that the rail crossing warrant was originally considered by PTSL, but not included in their TIS because the exposure threshold numbers were not met. We recommend that the rail crossing warranting be included in the TIS.

5.3 George Street N/Blair Road Roundabout Screening

In October 2016, PTSL applied the Waterloo Region roundabout feasibility initial screening tool to the Blair Road/George Street North intersection to determine if further consideration of a roundabout at this location is warranted. It concluded that the 20 year life cycle cost of a roundabout is less than other traffic control (i.e. signals), and therefore proceeding to conduct a full Intersection Control Study is warranted. Although this assessment is not included in the TIS, its finding suggests that further discussion with the Region on conducting a full Intersection Control Study at this location should be advanced.