**TABLE A – PROPONENT RESPONSE TO PART II ORDER REQUESTS**

All Issues and Concerns were submitted by **Gerald W. Cooper**

<table>
<thead>
<tr>
<th>PROPONENT:</th>
<th>County of Simcoe</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROJECT TITLE:</td>
<td>County Road 22 (Horseshoe Valley Road) Transportation Improvements</td>
</tr>
<tr>
<td>PROJECT LOCATION:</td>
<td>Simcoe County Road 22, between 3rd Line and 4th Line of the Township of Oro-Medonte</td>
</tr>
<tr>
<td>PREPARED BY:</td>
<td>Joe Mullan, P.Eng. - Ainley Group</td>
</tr>
<tr>
<td>DATE SUBMITTED TO MOECC</td>
<td>December 19, 2017</td>
</tr>
<tr>
<td>PHONE # and E-MAIL:</td>
<td>(705) 445-3451, <a href="mailto:mullan@ainleygroup.com">mullan@ainleygroup.com</a></td>
</tr>
</tbody>
</table>

### Issues and Concerns

<table>
<thead>
<tr>
<th>1. Climbing Lanes:</th>
<th>Proponent Response</th>
<th>Status</th>
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</thead>
<tbody>
<tr>
<td>a) Warrant is not met</td>
<td>During the completion of the Class EA, Ainley completed a Climbing Lane Warrant Assessment, in accordance with the methodology provided in Section B.4.4.1.1 of the MTO Geometric Design Standards for Ontario Highways (GDSOH). This is described in Section 6 of the “Haul Route Assessment” included in Appendix K of the ESR.</td>
<td>No future meetings or communication are planned with Mr. Cooper as we do not feel they will change his mind on any of his issues or concerns.</td>
</tr>
<tr>
<td>b) Misrepresented key statistics by including Class 5 through 9 Trucks and Buses in Analysis.</td>
<td>As a result of public comments received at PIC # 2 in May 2014 regarding the need for the climbing lanes, the County retained CIMA+ to complete an independent Peer Review of Ainley’s Haul Route Assessment, which includes the Warrant Analysis for the proposed climbing lanes. CIMA+’s initial Peer Review was completed in July 2014 and concluded that the Warrant Analysis was thorough and complete; it applied the appropriate industry standard guidelines and methodology; but suggested that some clarification was required to support the ultimate findings. This clarification was subsequently provided by Ainley in October 2014, following which in December 2014, CIMA+ then issued final Peer Review comments in full support of the conclusions of the Warrant Analysis, which included the following statements:</td>
<td></td>
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<tr>
<td>c) Conflict with Climbing Lanes and Roundabouts</td>
<td>1. CIMA confirms that the inclusion of Class 5 vehicles in assessing the warrant criterion number 3 (upgrade truck flow exceeds 20 vehicles per hour) is consistent with the guidance provided in the GDSOH. 2. CIMA confirms that truck climbing lanes are warranted in the study area for the following reasons: a) Based on 7% or steeper upgrades that extend for at least 600 metres in either direction from the bottom of the hill near the Horseshoe Resort entrance, a speed reduction of 15 km/h or greater is expected for all possible scenarios, therefore the warrant criterion number 1c is satisfied; and b) Based on Ainley Group’s comments regarding the consistency between traffic data used in the original study from 2011 and subsequent 2014 traffic counts, we find that the warrant criteria numbers 2 and 3 (upgrade traffic flow and upgrade truck flow, respectively) have also been satisfied. 3. Ideally, additional evidence should be provided to justify the selection of an appropriate performance curve for design purposes, and also to ensure that the Class Environmental Assessment process is thoroughly</td>
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</table>
TABLE A – PROPONENT RESPONSE TO PART II ORDER REQUESTS

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<td><em>documented. Research on technical specifications of different Class 5 vehicle types would be desirable to assess the range of power-to-weight ratios of these vehicles. However, the climbing lane is expected to be warranted regardless of which performance curve is used.</em>”</td>
<td></td>
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<td></td>
<td>Copies of the CIMA+ Peer Review letter dated July 2014, Ainley’s October 2014 Response, and CIMA+ Final Peer Review letter dated December 2014 have been attached for reference.</td>
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<td></td>
<td>Following PIC # 2 in May 2014, Ainley, on behalf of the County, retained McElhanney Consulting to undertake an “Intersection Control Study” to assess the use of roundabouts versus standard signalization (as this was not in the original scope of work awarded by the County) at the three main intersections within the Study Area (3rd Line, Horseshoe Boulevard, and 4th Line). McElhanney’s Study recommended the use of roundabouts at each of the three intersections. However; given the significance of this change, the County again retained CIMA+ to complete an independent Peer Review.</td>
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<td></td>
<td>As <em>[Mr. Cooper]</em> states, the peer review did note that there is potential for conflict with the termination of the climbing lane at the 4th Line with the proposed roundabout that required refinement. This was further discussed with McElhanney and it was agreed that, rather than having vehicles merge back into the through travel lane on the steep upgrade in advance of the roundabout, it would be preferred to maintain the climbing lane through the roundabout with the termination of the lane occurring to the east of the roundabout. This results in a partial multilane roundabout at this location, which is not uncommon and can be found on many MTO roadways. This is the design concept that has been illustrated in the Preferred Alternative Design Solution.</td>
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<td></td>
<td>Copies of the McElhanney “Intersection Control Study” and the associated CIMA+ Peer Review comments can be found in Appendix L of the ESR.</td>
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2. **Posted Speed Limit**
   a) Should be reduced to 50 km/h for entire corridor

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<tr>
<th>Issues and Concerns</th>
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<td></td>
<td>During the Class EA, the topic of speed limits was discussed and reviewed on a number of occasions. Based on the speed data collected by the County, it was determined that while the posted speed limit is 70 km/h, the 85th percentile speed (i.e. the speed at which 85% of vehicles travel at or under) was 97 km/h. This was partially attributed to the steep downgrades being conducive to a gain in speed and was also noted in the McElhanney “Intersection Control Study” as being one of the reasons why roundabouts are preferred over signalization as roundabouts are a proven speed reduction strategy.</td>
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<td></td>
<td>Subsequent to the McElhanney “Intersection Control Study” and the CIMA+ Peer Review, Ainley completed a speed limit review in September of 2016, a copy of which has been included in Appendix G of the ESR.</td>
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<td></td>
<td>The speed limit review concluded that the posted limit should be reduced to 50 km/h on the approaches and through the proposed roundabouts in accordance with TAC, MTO, and OTM standards. Within the mid-block sections between roundabouts, two options were considered: maintaining the reduced 50 km/h speed or increasing it to 70 km/h. It was ultimately concluded that given the steep up and down grades, plus the 3km between the 3rd Line and 4th Line that it was more conducive to provide a 70 km/h speed limit between the proposed roundabouts. It was further concluded that the speed limit should be maintained at 70 km/h to beyond Trillium Trail at the east limit of the project (its currently 80km/h through this zone), to address concerns expressed by area residents.</td>
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<tr>
<td>Issues and Concerns</td>
<td>Proponent Response</td>
<td>Status</td>
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<tr>
<td>b) Should utilize radar signs and additional police enforcement</td>
<td>In direct response to the public comments received during PIC # 1 &amp; 2 regarding speed reduction in the area, it was noted on the display boards for PIC #3 (Appendix D of the ESR) that the County would, after the transportation improvements have been completed, periodically install mobile speed monitoring signs, along with public education initiatives regarding the proposed roundabouts and the associated speeds in the area. The County also noted that they would request that the local OPP increase their speed enforcement in the area.</td>
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<tr>
<td>c) Speed limit should be reduced due to local context and prevalence of demanding weather such as heavy and sudden rainfalls, snow squalls, winds, etc.</td>
<td>With regards to the suggestion that the speed limit should be reduced as a result of the potential for inclement weather conditions, we note that regardless of the posted speed limit, drivers should adjust their speed to match driving conditions. Further, there are numerous other roads and highways throughout Central Ontario and Northern Ontario that have similar topographical features to County Road 22 and experience similar, if not worse winter conditions, that have higher speed limits, which are not set based on potential weather conditions.</td>
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3. **Alternate Truck Routes**

a) Should have included consideration for route along Highway 93 from Highway 11 to Craighurst, then westerly on CR 22 to Highway 26

During the Phase 2 of the Class EA, a “Haul Route Assessment” was prepared and a copy is included in Appendix K of ESR. The purpose of the report was to address the following:

- Assess truck traffic volumes and truck trip distribution on the section of County Road 22 being studied;
- Identify potential haul routes between Orillia in the west and Highway 26/Stayner/Collingwood to the east;
- Review traffic volumes on the potential haul routes;
- Identify potential road improvements and associated preliminary cost estimates; and
- Carry out a climbing lane warrant analysis.

Section 2 of the “Haul Route Assessment” highlights that 78-88% of the truck traffic on this section of County Rd 22 is “coming from” or “going to” the 3rd Line, Horseshoe Boulevard, or 4th Line. Meaning that only 12 – 22% of the truck traffic are going elsewhere. For trucks delivering goods or services to the Horseshoe Resort area, County Rd 22 is the only access. The report also identifies that for trucks delivering goods or services to the 3rd and 4th Line, County Rd 22 is the most direct route.

Ainley did complete a comprehensive analysis in the “Haul Route Assessment” report and concluded that a truck bypass route is not warranted. However; despite this conclusion, potential alternate haul routes were also assessed including one that is, for all intents and purposes, equal to the one proposed by (Ainley Route # 4). The difference between the two is that Ainley used a section of Hwy 400, whereas proposes a section of Hwy 93.

Within recent letter, he is comparing the following two separate routes, both of which are only a short portion of the overall route from Orillia to Highway 26/Stayner/Collingwood.

- Route # 1 – from Crown Hill to Craighurst along Hwy 93, a distance of 12.6 km (Google Maps).
- Route # 2 – from Price’s Corner to Craighurst along County Road 22, a distance of 19.8 km (Google Maps).
TABLE A – PROponent RESPONSE TO PART II ORDER REQUESTS

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<tr>
<td>Mr. Cooper's evaluation of these two portions of road is very misleading, in that, he has only compared an arbitrary section of County Road 22 (which runs east-west) to a section of Hwy 93 (which runs north-south). To fully assess both routes, the full distances between a similar origin and destination must be evaluated. As a result of most recent submission, we again looked at the travel times for a number of complete routes (Orillia to Collingwood) including his suggested route. The results (based on Google Maps) is presented as follows:</td>
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<td></td>
<td><strong>Summary of Truck Detour Routes</strong></td>
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</tr>
<tr>
<td></td>
<td>Route Description</td>
<td>Time (mins)</td>
</tr>
<tr>
<td></td>
<td>Mr. Gerald Cooper Route</td>
<td>45</td>
</tr>
<tr>
<td></td>
<td>Ainley Original Route 1-1</td>
<td>36</td>
</tr>
<tr>
<td></td>
<td>Ainley Original Route 2</td>
<td>41</td>
</tr>
<tr>
<td></td>
<td>Ainley Original Route 3-1</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td>Ainley Original Route 3-2</td>
<td>42</td>
</tr>
<tr>
<td></td>
<td>Ainley Original Route 4-1</td>
<td>42</td>
</tr>
<tr>
<td></td>
<td>Ainley Original Route 4-2</td>
<td>45</td>
</tr>
<tr>
<td></td>
<td>As can be seen, suggested route is the longest of all routes assessed and the driving time is also the greatest. The “Haul Route Assessment” report completed as part of the Class EA concluded that:</td>
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<td></td>
<td>➢ Given the low truck bypass volumes (17% of the total truck volumes) on County Road 22 as compared to 53% - 64% on roads in other communities, a truck bypass route is not warranted.</td>
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<tr>
<td></td>
<td>➢ The best route for truck traffic between Orillia and Highway 26/Stayner/Collingwood is County Road 22.</td>
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<td></td>
<td>b) Failed to consider Grey Road 119 (Scenic Caves Road) as a comparable example</td>
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<td>A comparison to other roadways with similar challenges was also included. We do not consider Grey Road 119 as being similar to County Road 22. Grey Road 119 (known locally as Scenic Caves Road) is not normally used by heavy truck traffic, whereas County Road 22 is a key route for east-west traffic, including truck traffic, travelling between Orillia and Collingwood/Stayner. Therefore, passing lanes were not needed or warranted in the design of Grey County Road 119.</td>
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<td></td>
<td>c) Should assess pollution produced by big rig tractor-trailers</td>
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<td></td>
<td>The proposed road improvements will not increase the overall capacity of County Road 22; therefore, we do not expect a resulting increase in traffic, including “big rig tractor trailers” and/or the air pollution from them.</td>
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</table>
TABLE A – PROPOSED RESPONSE TO PART II ORDER REQUESTS

<table>
<thead>
<tr>
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</table>
| 4. **Closure of Beechwood Rd.** | The proposed closure of Beachwood Road was identified and presented to the public at PIC #3 in September of 2016 and; therefore, did not appear out of the blue, as suggested by [REDACTED]. The closing of the Beechwood Road access to CR 22 was identified as a result of sightline issues and proximity to other intersections. In particular, we note that:  
  ➢ The two intersections of County Road 22 & Beachwood Road and County Road 22 & Maplecrest Court are only 110m apart;  
  ➢ Beachwood Road is only 250 m long with only 15 residential properties fronting on Beachwood Road; and  
  ➢ Emergency Services were copied on all Notices regarding this Class EA.  
While it is proposed to close the access to Beachwood Drive from County Rd 22, it will remain available for emergency access, if necessary, as noted in Section 6.1.1 and 7.2.3 of the ESR.  
In response to [REDACTED] specific concerns we note the following:  
- Although none of the identified accidents occurred directly at the Beechwood Rd intersection, it is considered that having two intersections in such close proximity increases the risk of future accidents. We suggest that the proposed closure of one of the intersections is proactive with respect to future safety.  
- First responders and emergency vehicles can easily access Beechwood Rd from Maplecrest with nominal loss of time.  
- Property owners on Beechwood Rd will not be severely inconvenienced and “at most” will have to drive an additional 500 m to get to or from County Road 22.  
- Access for fire-fighting purposes will not be impinged at all since the fire fighters can easily gain access to Beechwood from Maplecrest.  
- In our opinion, the closure of the Beechwood Road intersection will not have any negative impact on insurance premiums or property values. In fact, property values may increase (dead end street).  
A map of the Beechwood Road and Maplecrest Court area is attached for your information.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |        |
| 5. **Consultation** a) No evidence or report on discussions with utilities, Conservation Authorities, or First Nations and "gave short shrift" to input from residents and representatives of Horseshoe Valley. | The Class EA included enhanced consultation with agencies, First Nations, and property owners with five points of contact, including the Notice of Study Commencement, PIC 1 through 3, and the Notice of Completion. A copy of our Contact List and notification letters for each point of contact is included in the respective Appendices A, B, C, D, and P. Response letters were issued to all who provided comment. No issues or concerns were expressed by utilities, Conservation Authorities, or First Nations. Further contact and coordination will be required with both utilities and the Conservation Authority as the design proceeds, as noted in Section 9 of the ESR.  
We further highlight that the third PIC, on September 29, 2016 was specifically held to address public comments and concerns. In addition, the County has held multiple independent meetings with various stakeholders, including:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |        |
### TABLE A – PROPONENT RESPONSE TO PART II ORDER REQUESTS

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| ➢ The Horseshoe Valley Property Owners Association on April 7, 2015 and September 26, 2016.  
➢ The Management Team from Horseshoe Valley Resort on March 1 and September 20, 2016.  
➢ Township of Oro-Medonte (CAO, Mayor, Deputy Mayor, and Ward Councillor) on April 3rd, 2014. | Many of the recommendations noted throughout the ESR, including additional signage, use of radar signs, increased enforcement, addition of a bus lay-by between Pine Ridge Trail and Maplecrest, and paved bike lanes are a direct result of input received from area residents and stakeholders.  
Mr. Cooper did not attend PIC #1 or #2, but he did attend PIC #3 on September 29, 2016. A brief history of the comments received from Mr. Cooper and our responses is provided as follows, copies of the correspondence are included in Appendix D of the ESR:  
➢ [Name] provides completed Comment Sheet as a result of PIC #3;  
➢ [Name] provides additional comments in an email dated November 21, 2016;  
➢ Ainley responds to [Name]'s comments in a letter dated April 26, 2017 (sent by email);  
➢ [Name] replies to the April 26, 2017 letter in a letter dated May 9, 2017 (sent by email);  
➢ Ainley replies to [Name]'s comments in a letter dated October 30, 2017 (sent by email);  
➢ Notice of Completion published November 2, 2017; and  
➢ Request for Part II Order received from [Name] dated November 27, 2017 (received by Ainley on December 4, 2017). |        |
|                                                                                   | Given that the Horseshoe Valley Property Owners Association, through their designated representatives, were very active throughout this Class EA process raising issues and concerns on behalf of the residents and they did not submit a Part II Order Request, we are of the opinion that the concerns noted by [Name] are his alone. Further that through the enhanced consultation, and willingness of the County to make adjustments to the design, we have been able to satisfactorily address the residents and local stakeholders concerns regarding the proposed project. |        |
| 6. Lack of Completion or Postponement of                                           | Several of these items have not been expressed as a concern by [Name] until now, so we did not have the opportunity to previously respond. \  
A Stage 1 Archaeological Assessment Report was prepared in January of 2014 and filed with the Ministry of Tourism, Culture, and Sport. A copy is included in Appendix H of the ESR. The report noted that the majority of the right-of-way was previously disturbed and holds no archaeological potential. However, it also noted that a Stage 2 Assessment should be completed for any areas that have not been previously disturbed prior to construction. These areas will be refined as the detailed design progresses and a Stage 2 assessment will be coordinated, as necessary. This is noted in Section 9 of the ESR. |        |
<p>| a) Full Archaeological Assessment                                                   |                                                                                              |        |
| b) Environmental Site Assessment for Toxic Soils                                  | The need for a geotechnical assessment, chemical analysis of the soils, stormwater drainage assessment plus MOECC, Conservation Authority and Township approvals; as well as landscaping and tree assessments, are all identified in Section 9 of the ESR as requirements moving forward that will be completed during the Design phase. |        |
| c) Geotechnical Assessment                                                         |                                                                                              |        |
| d) Drainage and Stormwater                                                        |                                                                                              |        |
|                                                                                   | Further given that a large majority of the proposed works will be contained within the existing Municipal right-of- |        |</p>
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<thead>
<tr>
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<tr>
<td>Control Assessment and MOECC Approvals e) Landscaping and Tree Assessment f) Township Approval</td>
<td>way, with only localized property widenings required, it would be uncommon to complete these investigations during the Class EA process, but rather complete them once further details of the design are known.</td>
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<td>7. Accident Reporting a) Requests that the Study include OPP accident records between 2012 to 2016</td>
<td>The Class EA started in April 2013 (Notice of Commencement published April 13, 2013) and shortly thereafter we started gathering all the necessary background data. In particular, we gathered the readily available accident records for the period between Jan. 1, 2001 to Dec. 31, 2011 for County Road 22 between Hwy 26 to Hwy 12. This data represented 11 years of accidents and given that there were no major changes within the area between 2011 and 2013 (Class EA commencement), it was deemed appropriate to utilize this data for the Collisions Review assessment completed within Section 8 of the “Haul Route Assessment” (included in Appendix K of ESR). We do not anticipate that the 2012 to 2016 accident records will be much different than the previous 11 years of data that was assessed as part of the Class EA.</td>
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<td>b) Misrepresenting and overstating key statistics on accidents and big rig traffic volumes</td>
<td>We disagree with the assertion that we misrepresented and/or overstated key statistics on accidents and big rig traffic volumes. As noted earlier, during the completion of the Class EA, a Climbing Lane Warrant Assessment, was completed which included an assessment and projection of the truck traffic that would utilize County Road 22. This Study was independently Peer Reviewed by CIMA+ and although they had some minor comments, which were ultimately resolved by Ainley, they did not have any issues with the statistics on accidents and big rig traffic volumes.</td>
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County of Simcoe

Horseshoe Valley
Road Truck Climbing
Lane Warrant

Peer Review

July 2014

B000450
PREPARED BY:

Christopher Chahil
Transportation Intern

Giovani Bottesini, E.I.T.
Engineering Trainee, Transportation

Brian Applebee, C.E.T.
Project Manager, Transportation

VERIFIED BY:

Brian Malone, P.Eng. PTOE
Vice President, Transportation
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4. Summary of Recommendations ..................................................................... 6
1. Background and Understanding

Ainley Group (Ainley) is currently in the process of completing a Class Environmental Assessment (EA) for the County of Simcoe (the County). As part of the EA, a truck climbing lane warrant was completed for the upgrade to sections of Horseshoe Valley Road (County Road 22), travelling eastbound and westbound, from the Horseshoe Resort entrance (Figure 1). The warrant analysis resulted in the recommendation of a truck climbing lane on Horseshoe Valley Road and was outlined in the provided Truck Climbing Lane Review Memorandum.

Figure 1: Study Area

Through the public consultation process as part of the EA, the County received feedback from the public/stakeholders that was not in support of the truck climbing lanes. In response to this feedback, the County has temporarily halted work on the EA and has proactively decided to undertake a peer review of the truck climbing lane warrant process and results. CIMA was retained by the County of Simcoe to conduct this peer review of the truck climbing lane warrant analysis performed by Ainley.

2. Peer Review Process

CIMA undertook a peer review of the Truck Climbing Lane Warrant for Horseshoe Valley Road performed by Ainley. CIMA’s peer review included:

+ Review of industry guidelines and standards:
  • Ministry of Transportation Ontario (MTO) Geometric Design Standards for Ontario Highways (GDSOH) truck climbing lane warrant methodology; and

+ Review of data utilized to complete the warrant (provided by the County):
  • Traffic volumes along Horseshoe Valley Road, east and west of the Horseshoe Resort entrance; and
  • Vertical profile of the study area.

+ Review of the Ainley Truck Climbing Lane Review Memorandum, including:
  • Warrant methodology used;
  • Accuracy in the application of available data to the warrant criteria;
  • Accuracy in the application of the warrant method; and
  • Appropriateness of recommendations resulting warrant application.

3. Peer Review Findings and Recommendations

This section summarizes CIMA’s findings and opinions based on the peer review process noted above. Overall, we note that the work undertaken by Ainley was well done and complete in its assessment of the conditions. Ainley utilized the appropriate industry standard guidelines and the approach methodology was in keeping with these guidelines.

Application of the truck climbing lane analysis methodology by Ainley has been completed correctly, but has been based on the use of available data that required certain assumptions.

CIMA has identified items within the Truck Climbing Lane Review Memorandum that could benefit from additional clarification or analysis. We also provide recommendations on what actions could be undertaken to complete these additional items.

3.1 Industry Guidelines

The prevailing guidance regarding the determination of the need for truck climbing lanes is provided by TAC and MTO. Each lay out a warrant process to determine the potential need for truck climbing lanes on a given section of roadway. The use of either method is acceptable industry practice.

The TAC method refers to guidelines set out by American Association of State Highway and Transportation Officials (AASHTO).

The MTO method uses similar warrant criteria, which are outlined in section B.4.4.1.1 of the GDSOH, as follows:

Section B.4.4.1.1 – Warrants on Two-lane Highways
The warrant for a truck climbing lane is based upon the speed reduction or level of service drop experienced on the upgrade. A climbing lane is warranted if each of the following criteria is satisfied:
1. One of the following conditions exists:
level of service E or F exists on the grade.

+ a reduction of two or more levels of service is experienced when moving from the approach segment to the grade.

+ a 15 km/h or greater speed reduction is expected for a typical heavy truck.

2. Upgrade traffic flow exceeds 200 v/h.

3. Upgrade truck flow exceeds 20 v/h.

3.1.1 Finding
According to our review of the documentation, Ainley completed the warrant utilizing the procedure outlined in the MTO GDSOH, a recognized industry standard and appropriate for the study they were completing.

3.1.2 Recommendation
We do not have any recommendation for modifications to the Ainley report in conjunction with their selected methodology.

3.2 Traffic Volume Data
The County provided Ainley with traffic data along Horseshoe Valley Road. This data included traffic volumes and vehicle classification between the Horseshoe Resort entrance and 7th Line (corresponding to the recommended eastbound truck climbing lane) and between the Horseshoe Resort entrance and County Road 93 (corresponding to the recommended westbound truck climbing lane).

The volume counts were obtained from Monday August 15th to Thursday August 18th, 2011 and the vehicle classification counts were obtained from Monday August 15th to Friday August 19th, 2011.

3.2.1 Finding
The westbound volume and classification counts appear to be reliable. No obvious irregularities are present in the data. The eastbound volume counts appear to be reliable; however the eastbound classification counts seem to be classified incorrectly. On some days (e.g. August 16th, 2011), most of the heavy vehicle, bus and car counts are extremely low, close to zero, and there is a large percentage of vehicles which were not classed at all. On other days (e.g. August 17th and 18th, 2011), there is a large percentage of buses and little recorded volume of any other types of vehicle.

May 2014 and July 2014 traffic data was provided to CIMA for review and to be utilized if appropriate in support of this peer review. This data was not utilized in the Ainley report as it was collected after the report was completed. We reviewed this data and utilized it to assist in confirming some aspects of Ainley’s warrant analysis.
3.2.2 Recommendation

A review of the 2011 traffic count data utilized by Ainley identified some questions regarding vehicle classification. The truck climbing lane analysis could benefit from applying improved traffic count data, showing volume, speed and classification, as explained further in Section 3.3 of this report.

It would be our recommendation that a speed study be undertaken, preferably during the peak period(s), to determine the operating speed along this section of roadway. The resulting operating speed data would supplement the County’s current May 2014 and July 2014 volumes and could be utilized to confirm the warrant analysis.

3.3 Application of Warrant

3.3.1 Finding #1 – Warrant Criteria #1 – 15 km/h Speed Reduction

Ainley used a 120 kg/kW design truck, and its corresponding performance curve, to complete the analysis for this portion of the warrant. There was no rationale given for this choice of design vehicle provided in the Ainley report.

Selection of design vehicle is important in the determination of the need for truck climbing lanes. The TAC guidance states, in section 2.1.8.2, that “…the 180 g/W mass/power ratio is generally used as a design control and an exception should only be made where there is confidence that a different value would more closely represent the 85th percentile vehicle”. While the MTO GDSOH guidance does not provide a similar explicit statement, a justification of the power-to-weight ratio assumptions used in the analysis is important.

Ainley assumed a traffic signal was to be installed at the intersection of Horseshoe Valley Road and the Horseshoe Resort entrance. This covers the worst-case scenario of a truck stopped at this signal and accelerating from 0 km/h to enter the upgrade segment. If a signal is in place this is an appropriate assumption. However, given that the location is not currently signalized, it may also be desirable to apply the warrant under existing, unsignalized conditions, with a truck entering the upgrade segment at the actual operating speed and using the corresponding performance curve.

Speed data does not appear to have been collected or utilized in the Ainley analysis. We note that speed data could be collected in the study area to determine the actual operating speed along Horseshoe Valley Road. Because the design methodology indicates that a truck climbing lane should end in the area where trucks are able to regain a speed that is within 15 km/h of the operating speed, it is important to understand what that speed is. From Ainley’s calculations, the end point of the truck climbing lane is shown to be when a speed of 65 km/h is reached, which appears that an assumed operating speed of 80 km/h was utilized. Clarification should be provided in the analysis to explain the rational for utilizing this speed.

We also note that Section J.2.1.3 of the GDSOH indicates, “…when using the graphs, vertical curves are generally ignored and speeds are usually taken from the graphs on the assumption that the vehicle travels in a straight line from one point of grade intersection to the next”. The grades and lengths Ainley retrieved from the provided vertical profile were more detailed than was required.
Fewer grade changes, resulting in longer lengths of straight-line average grades, could have been used. Although a more detailed analysis is generally considered to be more accurate, uniformity in the application of the method is desirable to avoid inconsistency with other locations in the County.

3.3.1.1 Recommendation #1
It would be our recommendation that application of the typical performance curve for 180 kg/kW trucks, or the provision of rationale for the application of a different truck weight-to-power ratio, should be utilized for the appropriate measured operating/entry speed.

It would also be our recommendation that if there is any uncertainty in the installation of the traffic signal at the Resort entrance that the County review two warrant scenarios: the included worst-case scenario where the initial speed of 0 km/h is assumed, and an additional scenario where the measured operating speed, obtained from current traffic counts, is used.

It would also be our recommendation that the application of the selected performance curve assuming that vehicles travel in a straight line from one point of grade intersection to the next be used for consistency.

3.3.2 Finding #2 – Warrant Criteria #2 – Upgrade Traffic Flow Exceeds 200 Vehicle per Hour
It was reported by Ainley that both eastbound and westbound upgrade traffic flows exceed 200 vehicles per hour (veh/h). CIMA confirms this finding. As indicated by Ainley, the warrant requirement of greater than 200 veh/h upgrade flow is met.

3.3.2.1 Recommendation #2
CIMA provides no recommendation regarding this finding.

3.3.3 Finding #3 – Warrant Criteria #3 – Upgrade Truck Flow Exceeds 20 Vehicles per Hour
It appears from our review of the provided data that any vehicle classified as bus or larger was considered as heavy truck volume. This determination could be challenged as buses typically perform quite differently with respect to acceleration than a fully loaded heavy truck (i.e. WB-19 gravel truck).

For the Westbound truck climbing lane warrant, Ainley reported that upgrade truck flows exceeding 20 veh/h covered multiple occurrences over the five day count period. The warrant requirement of more than 20 trucks per hour upgrade flow is met, as indicated by Ainley, although this is based on the inclusion of buses in the “truck” count.

For the Eastbound truck climbing lane, Ainley reported upgrade truck flows exceeded 20 veh/h. Ainley also appropriately acknowledges that, “...the data appears to be skewed showing little to no cars and above average bus counts.” A 10% heavy vehicle ratio was then assumed in the
calculations. By applying this 10% heavy vehicle percentage to the provided volume counts, truck flows would exceed 20 veh/h over all four days.

Use of an estimate of truck volume as a percentage of traffic volumes is a reasonable practice. While the 10% value for heavy vehicles identified by Ainley is within a reasonable range, further clarification of the rationale used to determine that value would be of assistance.

Current 2014 Eastbound vehicle classification data (collected May 12th to 15th and July 14th to 17th) were provided to CIMA by the County. An examination of that data provided additional support of Ainley’s assessment of upgrade truck flow. The warrant criteria requiring truck volume traveling on the upgrade segment to exceed 20 veh/h is met on multiple occurrences over this data. The May 2014 counts show occurrences, on three of the four days of data, where upgrade truck volume exceeds 20 veh/h and the corresponding total volume is greater than 200 veh/h. The July 2014 counts show an occurrence, on one of the four days, where upgrade truck flow exceeding 20 veh/h coincides with total traffic volume greater than 200 veh/h. The Ainley assumption of 10% was found to be supported by this data.

3.3.3.1 Recommendation #3

Further clarification of the rationale for the determination of the heavy vehicle ratio of 10% would be valuable in the Ainley report, given that the value is critical in the truck climbing lane analysis. The assessment would be improved if current traffic counts including vehicle classification were used to more accurately determine the upgrade truck flow volumes.

4. Summary of Recommendations

CIMA undertook a peer review of the Horseshoe Valley Road truck climbing lane warrant with the goal of providing the County of Simcoe with a list of potential issues and/or deficiencies that may exist within warrant analysis.

Ainley Group executed the warrant procedure in accordance to the methodology outlined in the GDSOH. The method was appropriate for analysis purposes.

Ainley utilized the traffic count data made available to them for the study. Limitations in the traffic data were identified by Ainley and confirmed in this peer review. Ainley made certain assumptions with respect to traffic data to complete their analysis. Rationale for assumptions was not fully documented, although the assumptions were determined to be supported when assessed against subsequent data.

Given the critical importance of some of the assumptions on the report recommendations, confirmation of the rationale used should be provided. Preferable would be the use of more current traffic counts, representative of seasonal traffic patterns in the area could be collected and utilized. Current traffic counts could also be used to confirm the Ainley findings. The following summarize our recommendations:
• That application of the typical performance curve for 180 kg/kW trucks, or the provision of rationale for the application of a different truck weight-to-power ratio, should be utilized for the appropriate measured operating/entry speed;

• That if there is any uncertainty in the installation of the traffic signal at the Resort entrance that the County review an additional warrant scenario where the measured operating speed is assumed (with the corresponding performance curves);

• That the application of the selected performance curve assume that vehicles travel in a straight line from one point of grade intersection to the next be used for consistency;

• That clarification of the rationale for the determination of the heavy vehicle ratio of 10% would be valuable given that the value is critical in the truck climbing lane analysis; and

• That consideration be given to collection of current speed data for representative time periods. This speed data, along with the County’s current 2014 traffic volume and classification counts, could be utilized to further support the warrant analysis findings from Ainley, which are based on the 2011 counts.
We are writing to provide a response to the recommendations provided by CIMA, as summarized in Section 4 of their report entitled Horseshoe Valley Road Truck Climbing Lane Warrant Peer Review (dated July 2014), as requested.

**CIMA Recommendation 1** – That application of the typical performance curve for 180 kg/kW trucks, or the provision of rationale for the application of a different truck weight-to-power ratio, should be utilized for the appropriate measured operating/entry speed.

**AAL Response:** Prior to the commencement of the Class EA Study, a cursory assessment of the existing traffic conditions and road profile, within the subject section of County Road 22, was undertaken. Based on the 2011 three season traffic data provided by the County and the various truck classifications (Class 5 to Class 13) that were considered in the assessment of truck climbing lane warrants, it was noted the majority of the recorded truck volumes were in the Class 5 category. Class 5 trucks are characterised as being two-axle, six tire single unit trucks. This class of truck includes all vehicles on a single frame which have two axles and dual rear wheels. This includes single unit dump trucks, camping and recreational vehicles, motor homes, etc., that on average, fall within the 120 g/W power to weight category. As such, a conservative approach was taken by considering the more typical 120 g/W design vehicle as opposed to the larger and heavier 180 g/W design truck. The findings of this cursory assessment determined the warrants for truck climbing lanes were met.

At the commencement of the Class EA study, the warrants for truck climbing lanes were revisited using the Performance Curves for Heavy Trucks, 180 g/W, as per the recommendations provided in the Transportation Association Canada (TAC) Geometric Design Guide for Canadian Roads. The results confirmed the findings of the original warrant assessment were valid. In addition, an entry speed of 95 km/h was assumed (as opposed to a stop condition) as per the TAC guidelines. We note this entry speed (measured at the base of the hills) is consistent with the 85 percentile average measured operating speed from the July 2014 speed survey conducted by the County as part of the traffic volume and classification survey.
CIMA Recommendation 2 – That if there is any uncertainty in the installation of the traffic signals at the Resort entrance that the County review an additional warrant scenario where the measured operating speed is assumed (with the corresponding performance curves).

AAL Response: As noted above, based on the Performance Curves for a 180 g/W design vehicle and an entry speed of 95 km/hr at P.I. # 1 (i.e. the bottom of the hill near the Horseshoe Resort entrance), the design truck decelerates to 35 km/h in the westbound direction (towards Line 3) due to a 620m upgrade at 7%. In the east bound direction (from approximately 500m east of Horseshoe Resort entrance towards Line 4), the design truck decelerates to 30 km/h due to a 700m upgrade which exceeds 7%.

We note the critical length of grade is 120m, as per Table 2.1.8.1 of the TAC manual. This is the length of specific grade in metres at which the design truck speed is reduced by 15 km/h from its entry speed (i.e. 95 km/h).

CIMA Recommendation 3 – That the application of the selected performance curve assumes that vehicles travel in a straight line from one point of grade intersection to the next is used for consistency.

AAL Response: The above noted analysis was completed using the 180 g/W Performance Curve and application of a straight line of travel from the entry point of the grade to the second point of intersection where the truck experiences a grade change in the uphill direction.

CIMA Recommendation 4 – That clarification of the rationale for the determination of the heavy vehicle ratio of 10% would be valuable given the value is critical in the truck climbing lane analysis.

AAL Response: The determination of truck volumes during the peak hour was originally derived from the County of Simcoe 2011 traffic count survey data by totalling the recorded truck volumes in the Class 5 (2 axle 6 tire) to Class 13 (>6 axle, multi) counts. We note on several occasions during the traffic survey, the total traffic volume during the peak hour was greater than 200 vehicles and the total number of trucks during this same period was 20 or more. Thus the truck climbing warrants are satisfied. The reference to a 10% truck ratio was a general correlation of the total traffic volume and truck traffic volumes recorded during the peak periods of the 2011 traffic surveys. This total traffic and truck volume ratio has also been substantiated by the updated traffic counts carried out by the County in May 2014, July 2014 and October 2014.

CIMA Recommendation 5 – That consideration be given to collection of current speed data for representative time periods. This speed data, along with the County’s current 2014 traffic volume and classification counts could be utilized to further support the warrant analysis findings from Ainley, which are based on 2011 counts.

AAL Response: We note the traffic surveys completed by the County in July 2014, included speed survey data. This information has been considered to further support the alternatives being considered to address the Problem Statement, including the analysis of truck climbing lane warrants.
We also note the traffic counts carried out by the County in May, July and October of 2014 are consistent with the 2011 traffic data, which further supports that the truck climbing lane warrants are met.
December 1, 2014

Mr. Christian Meile
Director Transportation Construction and Maintenance
County of Simcoe
1110 Highway 26
Midhurst ON L0L 1X0

Ms. Deborah Korolnek
General Manager of Engineering, Planning and Environment

Subject: Horseshoe Valley Road Truck Climbing Lane Warrant Peer Review

Introduction

Ainley Group completed a truck climbing lane warrant analysis for the upgrade sections of Horseshoe Valley Road (County Road 22), both eastbound and westbound of the Horseshoe Valley Resort entrance, as part of a Class Environmental Assessment for the County of Simcoe. CIMA undertook a peer review of the warrant analysis, which resulted in recommendations from CIMA that Ainley Group clarify some of the assumptions made while performing their analysis.

Ainley Group provided a response memorandum commenting on CIMA’s recommendations. It is our understanding that Ainley Group conducted additional analysis following our peer review. It should be noted, however, that CIMA has not been provided with a full copy of the new analysis. Only the results summarized in Ainley Group’s response memo were available for our review.

Warrant Procedure Utilized

As outlined in the GDSOH, “slow moving vehicles, in particular heavy trucks and recreational vehicles, can impede traffic flow and pose a safety hazard on significant upgrades. In these cases, the recommended safety improvement is a climbing lane.”

For a truck climbing lane to be warranted on two-lane highways, the GDSOH requires all three of the following criteria to be satisfied:

1. One of the following conditions exists:
   a. Level of Service (LOS) E or F exists on the grade;
   b. A reduction of two or more levels of service is experienced when moving from the approach segment to the grade;
   c. A 15 km/h or greater speed reduction is expected for a typical heavy truck;
2. Upgrade traffic flow exceeds 200 vehicles per hour;

3. Upgrade truck flow exceeds 20 vehicles per hour.

Only one of the three conditions under criterion number 1 (1a, or 1b, or 1c) is required to exist to satisfy this criterion, but all three conditions, (1 and 2 and 3) must be satisfied to achieve the truck climbing lane warrant.

CIMA’s Responses to Ainley Group’s Memorandum

The following discussion addresses Ainley Group’s responses to CIMA’s recommendations.

CIMA Recommendation 1: “That application of the typical performance curve for 180 kg/kW trucks, or the provision of rationale for the application of a different truck weight-to-power ratio, should be utilized for the appropriate measured operating/entry speed.”

Ainley Group’s Response: Ainley indicated that an assessment of existing conditions of County Road 22 had been undertaken. They found that the majority of trucks were Class 5, two-axle, six tire “single unit” vehicles. Examples of this fleet can include dump trucks, RV's and motor homes. They stated that they used “a conservative approach” of a 120 g/W design vehicle for calculations of the warrant for the truck climbing lane. They subsequently re-did the analysis using the 180 g/W (weight-to-power ratio) design truck and confirmed their warrant results. They also verified that they used an entry speed of 95 km/h, supported by the July 2014 speed survey conducted by the County.

CIMA’s Response: Class 5 vehicles include single-unit 2-axle trucks, which includes dump trucks, RV’s and dual-wheeled vehicles including some larger pick-up trucks. We confirm that including Class 5 vehicles is correct for the analysis. The vehicles in that class are considered by the GDSOH to potentially impede traffic flow and pose a safety hazard. It should be noted that other vehicles with similar characteristics, buses and pick-up trucks without dual rear wheels, were excluded from the analysis. Including the Class 5 vehicles in the warrant analysis is consistent with the guidance provided by the GDSOH for this analysis.

Conducting the warrant analysis using both 120 kg/kW and 180 kg/kW performance curves is acceptable. It confirms that a climbing lane is warranted for both conditions. We are not able to confirm Ainley Group’s statement that single unit dump trucks, camping and recreational vehicles, motor homes, etc., on average fall within the 120 g/W power to weight category, given the wide range of vehicle configuration that exist. The GDSOH provides four different performance curves, for 60, 120, 180, and 210 kg/kW trucks. Research on technical specifications of Class 5 vehicles would assist in confirming the desired performance curve to use, but would not alter the outcome of the assessment completed.

CIMA Recommendation 2: “That if there is any uncertainty in the installation of the traffic signal at the Resort entrance, that the County review an additional warrant scenario where the measured operating speed is assumed (with the corresponding performance curves).”
Ainley Group’s Response: Ainley confirmed that based on the 180 g/W design vehicle and an entry speed of 95 km/hr at the bottom of the hill near the Horseshoe Resort entrance the design truck would decelerate to 35 km/h in the westbound direction and to 30 km/h in the eastbound direction due to the upgrades, meeting the warrant criterion 1c.

CIMA’ Response: CIMA further conducted additional analysis using the 60 g/W design vehicle and confirms that Ainley’s analysis correctly determines that a speed reduction of 15 km/h from a 95 km/h entry speed can be expected for all available performance curves. A 15 km/h or greater speed reduction is expected for all possible scenarios. The warrant criterion number 1c is, therefore, satisfied.

CIMA Recommendation 3: “That the application of the selected performance curve assume that vehicles travel in a straight line from one point of grade intersection to the next be used for consistency.”

Ainley Group’s Response: Ainley noted their analysis was completed considering a straight line of travel from the entry point of the grade to the second point of intersection where the truck experiences a grade change in the uphill direction.

CIMA’ Response: CIMA confirms that Ainley followed the guideline indicated in the GDSOH.

CIMA Recommendation 4: “That clarification of the rationale for the determination of the heavy vehicle ratio of 10% would be valuable given that the value is critical in the truck climbing lane analysis.”

Ainley Group’s Response: Ainley noted that peak-hour truck volumes were originally derived from the County of Simcoe 2011 traffic count, totalling the Class 5 to Class 13 vehicles. They identified that on several occasions in the traffic survey the peak-hour volume was greater than 200 vehicles and trucks were 20 or more. They further note that traffic:truck volume ratio has also been substantiated by the counts carried out in May 2014, July 2014 and October 2014.

CIMA’ Response: Given that the 10% heavy vehicle ratio has been substantiated by recent counts, we find their original assumption reasonable.

CIMA Recommendation 5: “That consideration be given to collection of current speed data for representative time periods. This speed data, along with the County’s current 2014 traffic volume and classification counts, could be utilized to further support the warrant analysis findings from Ainley, which are based on the 2011 counts.”

Ainley Group’s Response: Ainley noted that traffic surveys completed in July 2014 included speed data. They used this information to further support the alternatives being considered and to address the Problem Statement, including the analysis of truck climbing lane warrants.
CIMA Response: We have no further comments regarding this recommendation.

Final Comments

1. CIMA confirms that the inclusion of Class 5 vehicles in assessing the warrant criterion number 3 (upgrade truck flow exceeds 20 vehicles per hour) is consistent with the guidance provided in the GDSOH.

2. CIMA confirms that truck climbing lanes are warranted in the study area for the following reasons:
   a. Based on 7% or steeper upgrades that extend for at least 600 metres in either direction from the bottom of the hill near the Horseshoe Resort entrance, a speed reduction of 15 km/h or greater is expected for all possible scenarios, therefore the warrant criterion number 1c is satisfied; and
   b. Based on Ainley Group’s comments regarding the consistency between traffic data used in the original study from 2011 and subsequent 2014 traffic counts, we find that the warrant criteria numbers 2 and 3 (upgrade traffic flow and upgrade truck flow, respectively) have also been satisfied.

3. Ideally, additional evidence should be provided to justify the selection of an appropriate performance curve for design purposes, and also to ensure that the Class Environmental Assessment process is thoroughly documented. Research on technical specifications of different Class 5 vehicle types would be desirable to assess the range of power-to-weight ratios of these vehicles. However, the climbing lane is expected to be warranted regardless of which performance curve is used.

Yours sincerely,

Brian Malone, P.Eng., PTOE
Vice President, Transportation