



December 10, 2021

Greenview Environmental Engineers
13 Commerce Court
Bancroft, Ontario K0L 1C0

Attention: Tyler Peters, Project Manager

Subject: Township of Wollaston Signage Review

INTRODUCTION

In partnership with Greenview Environmental, WSP was requested by Township of Wollaston staff to review two specific areas of Highway 620 near Coe Hill for conformance to Ontario Traffic Sign Standards. One sharp reverse curve location and one single curve have been highlighted by staff as areas of concern. In addition to this specific review, WSP will make general recommendations for signage upgrades and provide commentary for all of the Township of Wollaston Roads.

The site-specific review included field investigations as summarized below.

FIELD INVESTIGATIONS

WSP conducted the field signage review on November 30th starting at Hwy 620 in Wollaston Township. The two specific areas requested by Township staff were assessed first. The assessment included reviewing individual sign condition, relative hazards, and measuring offsets from the edge of pavement and heights from the shoulder to check compliance with Ontario Traffic Manual (OTM) standards.

WSP staff field reviewed two of the Townships' roads with higher traffic volumes and low-class bituminous surfaces (Lower Faraday Road and the Ridge Road) to assess general signage conditions.

Lastly, the two specific areas were reviewed at dusk to assess the reflectivity of signs throughout the hazardous areas.

The two areas of specific review requested by the Township are as follows:

1. The sharp reverse curve on Hwy 620, west of Coe Hill (near intersection of Gravel Pit Lane, both directions).

Westbound approach to this reverse curve has a weathered Wa-4L (sharp reverse curve sign) with an advisory speed of 60km/h. The Wa-4L has a significantly deteriorated reflective coating. WSP measured offsets and height from the edge of the travelled lane as meeting the OTM guidelines. There is a Wc-8L (truck entrance) that is offset 3.0m from the edge of pavement which does not meet OTM guidelines. All chevrons lining the curve are at different heights and with little spacing. Some of the chevrons are damaged with minimal reflectivity. See picture 1, Appendix A for example.

Eastbound approach to this reverse curve has a Wa-4L with an advisory speed of 60km/h. Wa-4L and Wa-7t (60km/h advisory speed tab) are in good condition. The offset and height of the sign are within OTM guidelines. There is also a Wc-5 (slippery when wet) sign in poor condition located in advance of the curve. The chevrons are behind steel beam guiderail and heights vary. There is also a Wa-2R (sharp curve) halfway through the reverse curve that is redundant. See picture 2, Appendix A for example.

2. The curve east of Coe Hill on Hwy 620, near intersection of Finnegan Lake Road and King Road.

The westbound approach to the curve east of Coe Hill near intersection of King Road has a Wa-3R (curve) sign approximately 100m in advance of curve. The sign is in good condition. The Wa-3R has an offset from edge of pavement of 1.8m and a height of 1.9m. See picture 3 in Appendix A and photograph of the approach.

The eastbound approach to the curve east of Coe Hill near intersection of King Road has a Wa-3L is weathered and is beginning to deteriorate. The steel U-flange post is leaning approximately 15 degrees. Existing three cable guiderail is in satisfactory condition. The reflective delineators on the posts are in poor condition. See picture 4, Appendix A for a photograph of the approach.

BACKGROUND

POSTED SPEED LIMIT

The posted speed of Highway 620 in the area of study is 80km/h. Posted speeds are derived from a multitude of factors such as sightlines, vertical and horizontal alignments, superelevation, roadside hazards, adjacent infrastructure, urbanization, and more. WSP assumes that the roadway was properly assigned a posted speed limit by the Township which is not subject to change. For the purpose of this report, WSP will not be completing analysis of the posted speed limit of the roadway or providing recommendations.



ADVISORY SPEED

Advisory speed tabs are currently existing as illustrated in photos 1 and 2 in Appendix A. Unlike posted speed limits, advisory speeds are classified as warning signage and not regulatory. Advisory speed tabs are effective in warning the driver to reduce speed for a potential hazard ahead. Generally, advisory speeds are determined using ball-bank indicator testing or through calculations involving inputs such as curve radii, superelevation, and surface friction of the roadway.

Through this investigation, WSP will not be completing a topographic survey of the road to gather alignment and superelevation data. WSP will approximate curve radii through best-fit analysis of satellite mapping and assume that proper superelevation rates were constructed. These approximate factors will be used for the purpose of analyzing advisory speeds on the two specific areas of study on Highway 620. The curve radii will be used to determine the appropriate advisory speed using Table 3.2.3 of the TAC Geometric Design Guide for Canadian Roads (2017).

It should be noted that the sight distance and surface characteristics of the roadway are subject to change over time. This means that each location with an advisory speed tab should be periodically checked to apply appropriate speed revisions.

RECOMMENDATIONS

1. THE REVERSE CURVE ON HWY 620, WEST OF COE HILL (NEAR INTERSECTION OF GRAVEL PIT LN, BOTH DIRECTIONS).

Westbound

- Replace Wa-4L (sharp reverse curve) with oversized Wa-104L. Re-erect new Wa-104L with new Wa-7t (advisory speed tab) 30 meters in advance of first chevron. WSP recommends 2.0m offset and 1.8m height for Wa-104L with Wa-7t.
- WSP recommends changing the advisory speed tab (Wa-7t) to 40 km/h based on the approximated curve radius of 150m.
- Replace existing Wc-8L (truck entrance) sign with the oversized Wc-108L version and install it 30 meters in advance of the new Wa-104L location. WSP recommends 2.0m offset and 1.8m height for the Wc-108L sign.
- Chevron spacing along horizontal curves shall be per Table 7 of OTM Book 6.
- WSP recommends that the standard chevrons (Wa-9) to be replaced with upsized chevrons (Wa-109). The chevrons shall be spaced at 20m intervals along curve as per OTM Book 6 with two chevrons added in advance of the curve with 70m then 45m spacing respectively. WSP recommends 2.0m offset and 1.5m height ensure signs are illuminated by all low beams.
- New chevron signage shall always be placed at right-angles to the travelled lane.

Eastbound

- Replace Wa-4L (sharp reverse curve) with oversized Wa-104L. Re-erect new Wa-104L with new Wa-7t (advisory speed tab) 30 meters in advance of first chevron. WSP recommends 2.0m offset and 1.8m height for Wa-104L with Wa-7t.
- WSP recommends changing the advisory speed tab (Wa-7t) to 40 km/h based on the approximated curve radius of 150m.
- WSP recommends that the standard chevrons (Wa-9) to be replaced with upsized chevrons (Wa-109). The chevrons shall be spaced at 20m intervals along curve as per OTM Book 6 with two chevrons added in advance of the curve with 70m then 45m spacing respectively. WSP recommends 2.0m offset and 1.5m height ensure signs are illuminated by all low beams.
- Replace slippery when wet signage (Wc-5) with oversized sign (Wc-105) as recommended by OTM Book 6 and move to 30m in advance of the new Wa-104L location.
 - WSP recommends 2.0m offset and 1.8m height for Wc-105
 - WSP recommends this larger sign to be mounted on a new 4x4 wooden post
- Remove Wa-2R in advance of second part of reverse curve

2. THE CURVE EAST OF COE HILL ON HWY 620, NEAR INTERSECTION OF FINNEGAN LAKE RD/KING RD.

<p>Westbound</p> <ul style="list-style-type: none"> • WSP recommends existing Wa-3R be moved to be 50m in advance of curve and steel U flange be replaced as it is damaged (previous impact) <ul style="list-style-type: none"> ○ WSP recommends 2.0m offset and 1.8m height
<p>Eastbound</p> <ul style="list-style-type: none"> • Wa-3L and steel flange to be replaced and re-installed 50m in advance of curve <ul style="list-style-type: none"> ○ WSP recommends 2.0m offset and 1.8m height • WSP recommends placing delineator reflectors on the outside of the curve

3. GENERAL SIGNAGE RECOMMENDATIONS

<ul style="list-style-type: none"> • Signs should not be closer than 30m together, this can lead to obstructions for driver visibility. See picture 5, Appendix A for example. • All warning signs should have consistent offsets and heights <ul style="list-style-type: none"> ○ WSP recommends 2.0m offset where applicable and 1.8m height • One sign per post unless second sign is tab related to primary sign. WSP recommends signs to not be stacked unless conveying a consistent message. See picture 6, Appendix A for example. • WSP recommends annual or bi-annual signage inspections to replace any signs with defects <ul style="list-style-type: none"> ○ Defects can be weathering, damaged signs (bullets, plow trucks) or aged. See picture 7, Appendix A for example. ○ All signs that begin to show flaking or reflectivity falling off sign should be replaced. • WSP recommends any sign 75x75cm or larger be installed on a wooden post. • Oversized versions of warning signage shall be installed on roadways with posted speeds of 70km/h or higher. • WSP recommends delineators be used on any curves with radii smaller than 580m. • Per OTM Book 6, chevrons shall be applied to the outside of any curve that requires an advisory speed tab. Chevrons and delineators shall not be used on the same curve. • All new chevrons shall be placed according to Table 7 of OTM Book 6.

Note: All signage heights and offsets listed within this report are to be measured from the edge of the travelled lane. The height is measured to the bottom of the sign in reference. Secondary or tab signage shall be mounted directly below the primary sign that has been placed with specific location restrictions.



Sincerely,

A handwritten signature in black ink that reads "A Mansfield". The signature is fluid and cursive.

Andrew Mansfield, P.Eng., PMP

Manager, Transportation
Bancroft

T+ 1 343 357-0602

C+ 1 613 318-9037

Andrew.Mansfield@wsp.com

APPENDIX A



(1) Westbound approach to S curve located west of Coe Hill



(2) Eastbound approach to S curve located west of Coe Hill



(3) Westbound approach to curve near King Road



(4) Eastbound approach to curve near King Road



(5) Cluster of signs on Hwy 620.



(6) Three signs on one post on Lower Faraday Road.



(7) Sign with almost no reflectivity left on it on Hwy 620.