



# Red Hill Valley Parkway Judicial Inquiry

*Closing Submissions of the City of Hamilton*

MARCH 13, 2023

**Lenczner Slaght LLP**  
Barristers  
Suite 2600  
130 Adelaide Street West  
Toronto, ON M5H 3P5

Eli S. Lederman  
Jonathan Chen  
Delna Contractor  
Sahar Talebi

Lawyers for the City of Hamilton

## TABLE OF CONTENTS

<b>OVERVIEW</b> .....	1
<b>A. Part One – Safety of the Red Hill</b> .....	1
<b>B. Part Two – The City Took Steps to Maintain And Improve The Red Hill</b> .....	4
<b>C. Part Three – The City Took Steps to Improve Policies and Procedures</b> .....	6
<b>PART ONE - THE SAFETY OF THE RED HILL VALLEY PARKWAY</b> .....	6
<b>A. Background</b> .....	6
<b>B. Traffic Safety</b> .....	7
<b>C. Traffic Safety Experts</b> .....	8
i. The Red Hill Collision Rate is Similar to Other Highways.....	9
ii. The Red Hill Achieved the Target Safety Rate .....	11
iii. The Red Hill Followed the Design Guidelines Where Possible .....	11
a. The Red Hill Followed the 1985 MTO Design Guide.....	11
b. Actual Design Speed Would Not Change the 2015 CIMA Recommendations.....	13
c. Managing driver expectations on the Red Hill .....	15
<b>D. The Friction Levels on the Red Hill</b> .....	17
i. Only Mr. Hein Has Relevant Canadian Expertise with Friction Measurement and Management.....	18
ii. Pavement Friction is Rarely the Main Cause of Collisions .....	20
a. Primary contributory causes of wet road collisions .....	21
iii. Use of FN(90)R=30 is Reasonable .....	23
iv. Red Hill Friction Levels Were Acceptable Using FN30 .....	25
a. Expert evaluation of Red Hill friction values .....	25
b. Unreliability of interconversion from GripTester values to Locked Wheel values....	31
c. MTO did not express safety concerns.....	32
d. Golder did not express safety concerns .....	34
e. No violation of driver expectation .....	39
v. Collision Trends Do Not Show a Friction Problem.....	39
<b>E. Stone Mastic Asphalt Mix Design Was Acceptable</b> .....	41
<b>F. High Quality Aggregate Used in Asphalt Mix Design</b> .....	42
<b>G. Decreasing Friction Demand is Reasonable to Address Wet Road Collisions</b> .....	42
<b>H. Proposed Remedial Measures by Golder Were Not Necessary</b> .....	44

<b>PART TWO - THE CITY TOOK STEPS TO MAINTAIN AND IMPROVE THE RED HILL.....</b>	<b>45</b>
<b>A. Hamilton Strategic Road Safety Program .....</b>	<b>46</b>
<b>B. Traffic Safety Status and Annual Collision Reports .....</b>	<b>47</b>
<b>C. Network Screening and Collision Countermeasures Programs .....</b>	<b>48</b>
<b>D. Safety Reviews and Studies by CIMA – The Safety Experts .....</b>	<b>51</b>
i. The City Engaged a Third-Party Expert to Conduct Safety Assessments on the Red Hill .....	51
ii. The City Relied on CIMA’s Expertise to Identify Safety Issues .....	52
iii. The City Relied on CIMA to Identify the Necessary and Optional Countermeasures .....	53
iv. The City Relied on CIMA to Prioritize Recommendations and Provide Appropriate Timelines.....	54
v. The 2013 CIMA Report .....	55
a. CIMA’s collision analysis.....	56
b. The City implemented the recommendations in the 2013 CIMA Report.....	58
c. Some optional recommendations in the 2013 CIMA Report were reasonably not implemented.....	60
vi. The 2015 CIMA Report .....	62
a. The City implemented the recommendations in the 2015 CIMA Report.....	64
b. The City’s focus on combating excessive speeding was consistent with the information available at the time .....	66
c. Friction testing would not have resulted in different safety recommendations .....	69
d. The pavement friction experts agree with the City’s approach to focus on minimizing excessive speeding .....	70
vii. The City Undertook Additional Consultant Studies to Maintain and Improve the Red Hill .....	72
<b>E. The City Concluded that No Interim Measures on the Red Hill were Necessary Prior to the Resurfacing.....</b>	<b>73</b>
i. Public Works Staff Assessed the Safety of the Road and Considered the Need for Interim Measures .....	74
a. Mr. Soldo confirmed that the Red Hill was operating safely in the fall of 2018.....	74
b. It was not necessary to implement interim measures on the Red Hill prior to resurfacing.....	77
ii. Legal Services did not interfere with Public Works’ assessment of interim measures ....	84
iii. CIMA Confirmed that Interim Measures were Not Necessary .....	87

**PART THREE - CHANGES TO THE CITY’S POLICIES TO ENHANCE  
TRANSPARENCY, ACCOUNTABILITY, AND COLLABORATION..... 89**

**A. Sharing of Consultant Reports with Identified Imminent Risks to Health or Human  
Safety ..... 90**

**B. Council-Staff Relationship ..... 92**

**C. Public Works Quality Management System ..... 93**

    i. Document Control Procedure ..... 93

    ii. Control of Records Procedure..... 94

    iii. Project Management Manual ..... 94

**D. Public Works – Red Hill Valley Parkway/Lincoln M. Alexander Parkway Operation  
and Maintenance Plan ..... 96**

**E. Chief Roads Official..... 97**

**F. Parkway Management Committee ..... 99**

**G. Consultant Report Tracking and Retention Divisional Procedure ..... 99**

**H. Guidance From Other Judicial Inquiries on Policy Recommendations and Findings of  
Misconduct..... 99**

    i. Guidelines on Findings of Misconduct ..... 100

        a. The threshold for findings of misconduct is not perfection ..... 100

        b. Findings of misconduct must be made on prevailing standards ..... 100

        c. Findings of individual misconduct should be made only when necessary ..... 102

    ii. Guidelines on Policy Recommendations ..... 103

## OVERVIEW

1. In 2019, the City commenced this judicial inquiry (the “**Inquiry**”) to investigate the issues identified in the Terms of Reference with respect to the Red Hill Valley Parkway (the “**Red Hill**”) in the interest of accountability and transparency and to maintain the trust of the public.
2. As part of the Inquiry, Commission Counsel issued summonses and received over 131,941 documents, including over 64,000 from the City and interviewed 107 witnesses, including 55 City witnesses. At the hearing stage, the Inquiry received evidence from nearly 75 fact and expert witnesses, over 85 hearing days.
3. The City’s written submissions do not purport to summarize the extensive evidence that was presented throughout the course of the Inquiry. Rather, the submissions speak to three key issues: (1) the safety of the Red Hill; (2) the steps taken by the City to improve and maintain the Red Hill between 2007 and 2019; and (3) the various steps the City has taken since the commencement of this Inquiry in 2019 to improve its existing policies and procedures, both at the City-wide and at the Public Works levels, to enhance transparency, accountability, collaboration, and quality improvement. A high-level summary is provided below.

### **A. Part One – Safety of the Red Hill**

4. Part One explores the safety of the Red Hill and is broadly divided into the topics of roadway traffic safety and pavement friction. As more fully described in Part One, the evidence suggests the following:
  - a. The Red Hill was designed in accordance with the 1985 Ministry of Transportation Design Guide (“**MTO Design Guide**”). The Red Hill substantially followed the MTO Design Guide.
  - b. The 1985 MTO Design Guide provides design values which serve only as a starting point. It is recognized and accepted that in some cases, due to project, environmental or physical constraints, certain aspects of the guidelines cannot be

followed at all. Following the guideline does not mean a highway is safe, and a decision not to follow the guideline does not mean that a highway is unsafe. No challenge is being made to the design choices that were made by the planners of the Red Hill.

- c. The Red Hill was constructed with a surface layer of Stone Mastic Asphalt (“SMA”). The SMA mix design used was consistent with current mix design practices for SMA. The aggregate used in the SMA was an aggregate from the Varennes Quarry in Quebec. The technical data and testing conducted on the aggregate show that the aggregate had good technical properties and functional performance and was suitable for use in SMA.
- d. Pavement friction is influenced by macrotexture and microtexture. Generally, macrotexture contributes to skid resistance at higher speeds and microtexture contributes to skid resistance at lower speeds. There is no dispute that the macrotexture values measured are appropriate. While there is dispute over the microtexture, the Canadian experts, Mr. David Hein and Professor Hassan Baaj, opined that the friction decline, which is expected for any aggregate in service, over a six-year period is within the norm.
- e. Friction values were taken of the Red Hill between 2007 and 2019 by different entities and with different measuring devices. Locked-wheel tester measurements were taken by the Ontario Ministry of Transportation (“MTO”) from 2007-2012 and 2014, and by Applied Research Associated in 2019 before and after the resurfacing of the Red Hill. GripTester measurements were taken by Tradewind Scientific Ltd. (“Tradewind”) in 2013 and by Englobe before resurfacing in 2019.
- f. Mr. David Hein reviewed the friction results, and in particular, the locked-wheel results, and concluded that they are acceptable for an Ontario highway. Mr. Hein examined the friction values using the prevailing guideline to be applied in the industry in respect of roadway friction in Ontario, which is that friction values at or above 30 taken at the posted speed are acceptable and that results below 30 may merit further investigation.

- g. Dr. Gerardo Flintsch, an American friction expert, examined the friction results using friction guidelines from the United Kingdom and opined that the friction results are relatively low. However, Mr. Hein opined that those guidelines were developed based on the local conditions of the United Kingdom and should not be applied here without further analysis. In his career spanning four decades, Mr. Hein has not seen those guidelines used as a reference to assess the frictional qualities of Canadian roads.
- h. The City was at no point advised of any safety concerns arising from the friction values of the Red Hill by the MTO or Golder Associates (“**Golder**”), a pavement consultant hired by the City to evaluate the Red Hill.
- i. Even if the supply of friction was inadequate at localized spots on the Red Hill, the friction experts agree that one method to address inadequate friction is to reduce the demand for friction through countermeasures such as additional signage and speed enforcement, which were implemented.
- j. Supplying additional friction is not always necessary, especially since pavement improvements may not reduce the occurrence of collisions, are often associated with significant costs, and countermeasures can have a substantially higher impact on collisions than incremental improvements to pavement friction.
- k. Golder made recommendations to microsurface a significant portion of the Red Hill in 2014 and to shotblast areas of concern in 2018. Neither of these measures were necessary to improve friction as the values were acceptable according to the opinion of Mr. Hein. Specifically, with respect to shotblasting, Mr. Hein and Dr. Flintsch agree it is a very temporary remedy and that resurfacing, which took place in 2019, was the better approach.
- l. The Red Hill collision rate was calculated by CIMA. A collision rate is an important factor in determining roadway safety. The Red Hill collision rate is similar to the collision rate of the comparable segments of its peer facilities.

**B. Part Two – The City Took Steps to Maintain And Improve The Red Hill**

5. Part two summarizes the various processes and initiatives developed to monitor and improve the safety of the Red Hill in a cost-effective manner, including internal programs and external safety assessments of the Red Hill, completed by third-party safety experts.
6. The Transportation Operations and Maintenance division of the Public Works department (“**Public Works**”) spent considerable time and resources monitoring, maintaining, and improving the Red Hill, including through the following:
  - a. The publication of Traffic Safety Status and Annual Collision Reports, which provide collision information about the City roadways, including the Red Hill, foster transparency in the work of Public Works to monitor and improve the safety of the City’s roadway transportation system.
  - b. The City’s Network Screening program, which assesses the entire road network to identify the locations at which collisions are overrepresented to best allocate the use of City resources. Through the City’s Collision Countermeasures program, City staff implemented countermeasures to improve the identified locations. The evidence indicates that the Collision Countermeasures program functioned as intended to assess the Red Hill for any segments that required attention and implement countermeasures to reduce collisions.
7. The Inquiry received extensive evidence on the various reports and studies completed on the Red Hill between 2013 and 2019, including two safety reviews completed by CIMA in 2013 and 2015. As part of the 2013 CIMA Report, CIMA reviewed the operational and safety aspects of a segment of the Red Hill. The evidence indicates that:
  - a. CIMA did not identify any urgent or significant safety issues during this review. In fact, it concluded that overall, the Red Hill was operating safely.
  - b. CIMA recommended countermeasures to improve the safety performance of the Red Hill including for specific segments that could benefit from improvement. The



City implemented CIMA's recommendations in a staged manner, consistent with industry best practices.

8. Following CIMA's 2013 Safety Review, City staff monitored the collisions on the Red Hill, particularly as it related to wet weather collisions and by the end of 2014, determined that a review of the entire Red Hill would be prudent.
9. In 2015, CIMA completed a detailed safety review of the Red Hill. CIMA identified potential countermeasures to improve the safety performance of the Red Hill, the majority of which were implemented within a two-year period, notwithstanding that the timeline for completion was 0 to 5 years.
10. With respect to CIMA's conclusion that a combination of high speeds and wet surface may be the primary contributing factors to collisions on the Red Hill, the City implemented immediate measures to combat the excessive speeding on the Red Hill, including through signage and police enforcement, while investigating potential means to rehabilitate and resurface the Red Hill, which was ultimately done in 2019.
11. The Inquiry received the following evidence regarding the City's focus on combating excessive speeding:
  - a. It was widely understood in the traffic safety industry that driver behaviour and speeding was a primary contributor to collisions. As stated by Mr. Malone, "...the importance of friction in the diagnosis, in the determination of factors that may be causal factors in collisions was not clear at all. In fact, there were other factors that were much more clearly identified, including speed, and potentially driver behaviour."
  - b. Both friction experts agree that friction is seldom the cause of collisions but can contribute to collisions in the face of other contributing factors, such as speeding or curvature. Importantly, the experts also agree that in these circumstances, increasing the friction values **or** decreasing the demand for friction, through speed enforcement, would avoid collisions or reduce the severity of collisions.

12. On the issue of whether CIMA would have changed its assessment regarding the role that pavement surface played in collisions in its 2015 report if CIMA received a copy of the Tradewind Report, Mr. Malone confirmed that “the Tradewind Report is not the smoking gun of confirmation that pavement surface was the primary cause of collisions on the Red Hill.”

**C. Part Three – The City Took Steps to Improve Policies and Procedures**

13. Part three outlines the various steps the City has taken since the commencement of this Inquiry in 2019 to improve its existing policies and procedures, both at the City-wide and at the Public Works levels, to enhance transparency, accountability, collaboration, and quality improvement.
14. The improvements are consistent with best practices in municipal governance and designed to achieve the following objectives:
  - a. Consistent and accessible document management creating systems and practices enhancing accountability and sharing of information across multiple divisions and departments;
  - b. Consistent and transparent communication between City staff, City Council and the public, while developing clear processes for the sharing of consultant reports which identify imminent risk to human health or safety; and
  - c. Better coordination between groups for efficient project delivery across the City and various departments and divisions, addressing any fragmentation of the structures and systems by providing consistent coordination and oversight of roles and responsibilities.

**PART ONE - THE SAFETY OF THE RED HILL VALLEY PARKWAY**

**A. Background**

15. The Red Hill is an urban freeway in the City. The Red Hill is 7.5 kilometres and located in an environmentally sensitive area along the Red Hill Creek. It forms the north-south leg of the link between Highway 403 and the Queen Elizabeth Way. The Lincoln M.

Alexander Parkway (the “LINC”) runs east-west and connects Highway 403 with the Red Hill.

16. Planning, design and construction of the Red Hill spanned from 1982 until its completion in 2007. The Red Hill was designed with a perpetual pavement structure to meet its sustainability objectives. Perpetual pavement technology is designed from the bottom up, which provides for an extended lifecycle and the avoidance of a major rehabilitation, and limits maintenance needs to the surface course. SMA, which is regarded as a premium mix, was selected for the surface course as it provides highly trafficked roads with a durable and rut-resistance wearing course, among other advantages over the conventional hot mix asphalt. The Red Hill was constructed with an experienced team consisting of a project management, consultant and contractor team working together to resolve issues that arose in an efficient manner.

**B. Traffic Safety**

17. Roadway traffic safety involves an examination of the measures and methodologies employed to promote and improve the safety of the road. The Inquiry has received extensive evidence on various issues related to roadway traffic safety.
18. There is risk with all highway transportation facilities. As such, the universal objective is to reduce the number and severity of crashes using the available information and with the available resources.<sup>1</sup>
19. In traffic safety, there is no such thing as absolute safety.<sup>2</sup> A road cannot be made safe; rather, a road can be made safer and traffic professionals can determine how much more or less safe a roadway is compared to a similar roadway facility.<sup>3</sup>

---

<sup>1</sup> [HAM0064754 Exhibit 229](#) at pg. A-2; [Examination of Russell Brownlee, dated February 21, 2023](#) [“**Brownlee Transcript, February 21**”] at pg. 15868, ll. 1 to 20.

<sup>2</sup> [HAM0064754 Exhibit 229](#) at pg. A-2; [Brownlee Transcript, February 21](#) at pg. 15868, ll. 1 to 20.

<sup>3</sup> [Examination of Brian Malone, dated June 1, 2022](#) [“**Malone Transcript, June 1**”] at pg. 3724 – 3726, ll. 10 to 15.

20. This Inquiry has heard from numerous fact and expert witnesses on a various of traffic safety topics. The following sections focus on the issues that were explored by and remain in dispute, in part or in whole, between the expert witnesses, which include:
- a. Whether the collision rate on the Red Hill is similar to comparator highways;
  - b. Whether the Red Hill complied with the relevant design guide;
  - c. Whether any driver expectations were violated and if so, whether they were managed on the Red Hill; and
  - d. Whether CIMA would have changed their recommendations had they been aware of the actual design speed of 100 km/h.

**C. Traffic Safety Experts**

21. This Inquiry heard evidence from two experts on roadway design and safety:
- a. **Mr. Dewan Karim** was retained by City of Hamilton. Mr. Karim is the Practice Lead of the Transportation Engineering and Safety Group at 30 Forensic Engineering, an engineering consulting firm. He holds the Professional Engineering designation in Ontario, British Columbia and Nova Scotia.<sup>4</sup> Mr. Karim tendered a report dated February 3, 2023 (the “**Karim Expert Report**”).<sup>5</sup>
  - b. **Mr. Russell Brownlee** was retained by Commission Counsel. He is the President of True North Safety Group, an engineering consulting firm.<sup>6</sup> He holds the Professional Engineering Designation in Ontario, British Columbia and Alberta.<sup>7</sup> Mr. Brownlee tendered a report dated March 9, 2022 (the “**Brownlee Primer**”).

---

<sup>4</sup> [Examination of Dewan Karim, dated February 23, 2023](#) [“**Karim Transcript, February 23**”] at pg. 16060, ll. 14 to 20; [30FE Report, dated February 3, 2023](#) [“**Karim Expert Report**”] [HAM0064759\\_0001](#), Exhibit 223 at pg. 39.

<sup>5</sup> [Karim Expert Report](#).

<sup>6</sup> [EXP0000074, Exhibit 015](#) at pg. 1.

<sup>7</sup> [Examination of Russell Brownlee, dated April 27, 2022](#) [“**Brownlee Transcript, April 27**”] at pg. 220 – 221, ll. 23 to 6.

**Expert Report”**)<sup>8</sup> and a report dated November 1, 2022 (the “**Brownlee Expert Report”**).<sup>9</sup>

22. Traffic safety evidence was also tendered by CIMA, which was retained by the City of Hamilton, to complete various road safety studies between 2013 and 2019.

***The Red Hill Collision Rate is Similar to Other Highways***

23. This Inquiry received evidence with respect to the purpose and value of calculating the collision rate for a particular roadway. A collision rate calculation is an important factor in studying roadway safety. Unlike assessing collision frequencies (e.g. the number of collisions that took occurred), a collision rate<sup>10</sup> calculation takes into account the length of the segment (e.g. road sections with homogenous characteristics) and the traffic volume.

24. Collision rate information enables a traffic safety professional to determine the relative safety of the roadway compared to other similar roadways, segments or intersections.<sup>11</sup> For example, a collision rate analysis breaks down collision data by segment and compare the collision rate to similar segments of another roadway. This results in an “apples-to-apples” comparison.<sup>12</sup>

25. Based on the evidence, the Red Hill collision rate by segment is comparable to collision rates of certain comparable peer highways by segment. This conclusion is evident from the work undertaken by CIMA in 2019.<sup>13</sup>

26. The City engaged CIMA to determine the collision rates on the Red Hill and LINC and to compare it with similar types of roadways. In the CIMA memo dated January 18, 2019, CIMA provided its results of the Red Hill collision rate compared with segments of the provincial highways—Highway 403, Highway 406, Highway 7/8 and Highway 8—shown below:

---

<sup>8</sup> [Report of Russell Brownlee, dated March 1, 2022](#) [“**Brownlee Primer Expert Report**”] EXP0000072, Exhibit 016.

<sup>9</sup> [Report of Russell Brownlee, dated November 1, 2022](#) [“**Brownlee Expert Report**”] EXP0000192, Exhibit 221.

<sup>10</sup> [Karim Transcript, February 23](#) at pg. 16132, ll. 12 to 21.

<sup>11</sup> [Karim Expert Report](#) at pg. 25.

<sup>12</sup> [Malone Transcript, June 1](#) at pg. 3711 – 3712, ll. 22 to 6.

<sup>13</sup> HAM0028108, Exhibit 009.

Highway/Section	Length (km)	Collisions (2013 – 2017)	Collision Rate
<b>RHVP</b>			
LINC – Mud	1.6	124	0.59
Mud – Greenhill	2.6	232	0.72
Greenhill – King	1.3	277	1.87
King – Queenston	0.8	144	1.66
Queenston – Barton	1.3	123	0.94
Barton – Railway Overpass	0.5	39	0.77
<b>Average Weighted Collision Rate</b>		<b>1.01</b>	

Table 2: Average Collision Rates for Comparison Sites (2012 – 2016)

Highway/Section	Length (km)	Collisions (2012 – 2016)	Collision Rate
<b>Highway 403</b>			
Highway 6 – York Boulevard	1.4	319	0.99
York Boulevard – Main Street	2.2	306	0.73
Main Street – Aberdeen	1.3	285	1.20
Aberdeen – LINC	4.7	505	0.68
<b>Average Weighted Collision Rate</b>		<b>0.81</b>	
<b>Highway 406</b>			
Highway 58 – Glendale	2.0	70	0.32
Glendale – Westchester	3.0	181	0.60
Westchester – Fourth Avenue	2.3	258	1.76
Fourth Avenue - QEW	3.9	115	0.57
<b>Average Weighted Collision Rate</b>		<b>0.78</b>	
<b>Highway 7/8</b>			
Conestoga/Victoria – Ottawa	1.5	224	0.74
Ottawa – Highway 8/King	1.3	159	0.68
Highway 8/King – Courtland	1.4	167	0.71
Courtland – Homer Watson	1.3	151	0.72
Homer Watson – Fischer-Hallman	2.6	203	0.75
Fischer-Hallman - Trussler	2.9	82	0.46
<b>Average Weighted Collision Rate</b>		<b>0.66</b>	
<b>Highway 8</b>			
Sportsworld – Fairway	3.6	369	0.71
Fairway – Highway 7	2.2	284	0.67
<b>Average Weighted Collision Rate</b>		<b>0.70</b>	

27. Based on the above, the Red Hill collision rates range from 0.59 to 0.77 for segments that are largely tangents and .94 to 1.87 for segments with curvature. As an example, Greenhill Avenue to King Street has a curvature radius of approximately 420 metres.<sup>14</sup>
28. Comparing the tangent segments (i.e., with a collision rate of .59 to 0.77) on the Red Hill with segments with similar characteristics of the other highways, the collision rates are

<sup>14</sup> [DUF0002535.001, Exhibit 003.1](#) at pg. 12.

generally similar. For example, Highway 406 collision rates vary from .32 to .60 and Highway 403 collision rates vary from .68 to .99 for similar segments.

29. Comparing the curvature segments (i.e., with a collision rate of .94 to 1.87) of the Red Hill and comparator segments of the other highways, the collision rates are similar. For example, the Westchester to Fourth Avenue segment on the Highway 406, which contains similar geometry, has a collision rate of 1.76.<sup>15</sup>
30. Accordingly, when a segment comparison is undertaken, it is evident that the collision rate of the Red Hill is similar to other comparable highways by segment.

*ii. The Red Hill Achieved the Target Safety Rate*

31. Aside from a collision rate that is similar to comparator segments of the provincial highways as discussed above, the Red Hill met the approved target safety rate set during the planning phase.<sup>16</sup>
32. The 1982 Environmental Assessment Submission set out the collision safety rate as 1.0 collisions per million vehicle kilometers travelled. This figure represented the collision rate target for provincial freeways, which was adopted by the Red Hill.<sup>17</sup>

*iii. The Red Hill Followed the Design Guidelines Where Possible*

*a. The Red Hill Followed the 1985 MTO Design Guide*

33. This Inquiry received evidence that the Red Hill followed the MTO Design Guide.<sup>18</sup> To that end, Mr. Brownlee performed a nominal safety review,<sup>19</sup> which assessed whether the Red Hill followed the minimum design values set out therein.<sup>20</sup>

---

<sup>15</sup> [Examination of David Ferguson, dated August 11, 2022](#) [“**Ferguson Transcript, August 11**”] at pg. 9534 – 9536, ll. 12 to 25.

<sup>16</sup> [Karim Expert Report](#) at pg. 26.

<sup>17</sup> [Karim Transcript, February 23](#) at pg. 16131 – 16132, ll. 23 to 11; [Karim Expert Report](#) at pg. 26.

<sup>18</sup> [Karim Expert Report](#) at pg. 15; [Brownlee Transcript, February 21](#) at pg. 15843 – 15844, ll. 24 to 4.

<sup>19</sup> As opposed to a substantive review which is a quantitative safety assessment to determine the actual performance of a roadway. See [Examination of Russell Brownlee, dated February 21, 2023](#) at pg. 15718 – 15719, ll. 17 to 15; [Karim Expert Report](#) at pg. 9.

<sup>20</sup> [Brownlee Expert Report](#) at pg. 5.

34. It is important to emphasize that following a guideline does not mean a highway is safe and not following a particular aspect of a guideline does not mean a highway is unsafe. It is also important to recognize that guidelines are merely beginning points and there is latitude to deviate from them in certain circumstances. In some cases, due to project objectives or constraints, certain aspects of a guideline may not be followed.<sup>21</sup> It is well-accepted that engineering judgment is to be applied in making final design choices.<sup>22</sup>
35. As set out in the Brownlee Report, the Red Hill by and large followed the minimum design criteria set out in the MTO Design Guide. As examples, the Red Hill followed the minimum design criteria for design speed (which determines geometric features of a roadway) and curvature.<sup>23</sup> In some cases, such as sight distance for certain sections on the Red Hill, Mr. Brownlee could not draw any conclusions because of logistical constraints. Only the interchange spacing<sup>24</sup> did not in most cases follow the minimum design values for full interchange highways (i.e., a 2 km minimum). As discussed below, the Red Hill interchange spacing followed the spacing for freeways with partial interchanges or alternate interchange configurations under the MTO Design Guide.
36. Mr. Karim provided a thorough discussion with respect to interchange spacing in his testimony and the Karim Report. First, by way of context, Mr. Karim identified a respected publication that referenced the general rule for interchange spacing as being 1.6 km (which is lower than the 2 km recommended for full interchanges in the MTO Design Guide), and other international research which found that interchange spacing varies widely from 1 km to 2 km for urban areas.<sup>25</sup> Second, Mr. Karim compared the Red Hill's average interchange spacing (i.e. 1.43 km) with that of similar highways such as the DVP (i.e. 1.64 km) and Highway 7/85 (i.e. 1.34 km).<sup>26</sup> The Red Hill spacing was similar or better than comparable

---

<sup>21</sup> [Examination of Russell Brownlee, dated April 27, 2022](#) [“[Brownlee Transcript, April 27](#)”] at pg. 238-239, ll. 18 to 7; [Karim Transcript, February 23](#) at pg. 16077 – 16078, ll. 2 to 7; [Brownlee Transcript, February 21](#) at pg. 15842 – 15843, ll. 10 to 11.

<sup>22</sup> [Brownlee Transcript, April 27](#) at pg. 239, ll. 15 to 25.

<sup>23</sup> Mr. Brownlee was unable to determine if the criteria was met for the curve south of the King Street interchange as he could not determine the superelevation. See [Brownlee Expert Report](#) at pg. 14.

<sup>24</sup> Interchange spacing is the distance between the center line of the crossroad where the interchange is located along the highway. See [Karim Transcript, February 23](#) at pg. 16092, ll. 1 to 8.

<sup>25</sup> [Karim Expert Report](#) at pg. 16.

<sup>26</sup> [Karim Expert Report](#) at pg. 17.



urban freeways.<sup>27</sup> Third, Mr. Karim testified that the MTO Design Guide permits interchange spacing that is less than 2 km provided that alternative interchange configurations are used or partial interchanges are implemented.<sup>28</sup>

37. Regarding the partial interchanges and alternative interchange configurations, Mr. Karim pointed out that while the LINC has full interchanges with six ramps, the Red Hill has partial interchanges with only four ramps. For example, a four-ramp interchange is evident at King Street.<sup>29</sup> Mr. Karim also identified alternative ramp/interchange configurations which used traffic signals to constrain and delay access to the Red Hill.<sup>30</sup>
38. Accordingly, while the Red Hill interchange spacing did not follow the 2 km minimum applied for full interchange roadways, the MTO Design Guide expressly contemplates interchange spacing under 2 km using alternative interchange configurations and partial interchanges.<sup>31</sup> This evidence is undisputed.

***b. Actual Design Speed Would Not Change the 2015 CIMA Recommendations***

39. In his discussion of design speed, Mr. Brownlee opines that CIMA assumed the incorrect design speed (i.e., 110 km/h instead of 100 km/h) in making its recommendations in the 2015 Report and that had the correct design speed been used, CIMA may have adjusted their recommendations after noticing the disparity between the posted, design and operating speeds.<sup>32</sup> As described below, Mr. Brownlee's view is not substantiated.
40. Excerpted below is Table 5 from the 2015 CIMA Report:

---

<sup>27</sup> [Karim Expert Report](#) at pg. 18. It is important to note that Mr. Karim only intended for this analysis to inform a nominal safety analysis.

<sup>28</sup> [Karim Expert Report](#) at pg. 19; [Karim Transcript, February 23](#) at pg. 16099, ll. 4 to 17.

<sup>29</sup> [Karim Expert Report](#) at pg. 19; [Karim Transcript, February 23](#) at pg. 16099 – 16100, ll. 4 to 23.

<sup>30</sup> [Karim Transcript, February 23](#) at pg. 16101 – 16102, ll. 2 to 16.

<sup>31</sup> [Karim Expert Report](#) at pg. 19.

<sup>32</sup> [Brownlee Expert Report](#) at pg. 4.

Measure	Northbound	Southbound
Average speed	95 km/h	99 km/h
85 <sup>th</sup> percentile speed	110 km/h	115 km/h
Exceeding speed limit	60%	72%
At or exceeding design speed	15%	22%
Exceeding 140 km/h	> 500 per day	
<i>Location: Mainline between Mud St. and Greenhill Ave.</i>		
<i>Date: May 2013</i>		

Figure 1: RVHP operating speeds (CIMA, 2015).

41. In drawing his conclusion, Mr. Brownlee places significant weight on the fact that the “at or exceeding design speed” percentages would increase had the actual design speed of 100 km/h been known by CIMA. However, as Mr. Brownlee admitted, the design speed does not affect all of the other data points such as the measured average speed, the 85<sup>th</sup> percentile speed, exceeding speed limit and exceeding 140 km/h.<sup>33</sup> These data points clearly evidence that excessive speeding was a prevalent issue on the Red Hill.
42. On cross-examination, Mr. Brownlee agreed that knowledge of drivers travelling 50 km/h over the posted speed limit (i.e. 90 km/h vs. 140 km/h) attracts heightened attention to transportation professionals and that even 30 km/h over CIMA’s assumed design speed of 110 km/h is significant in itself.<sup>34</sup> As such, CIMA would have known that speeding well over the posted limit was prevalent regardless of whether the design speed was 100 km/h or 110 km/h. The fact that the percentage of drivers who travel above the design speed is higher than initially understood would further support the conclusion that excessive speeding was prevalent on the Red Hill.
43. The Inquiry received important evidence on this point from Mr. Brian Malone, a Professional Engineer certified by the Transportation Professional Certification Board as a Professional Traffic Operations Engineer and Road Safety Professional.<sup>35</sup> Mr. Malone has

<sup>33</sup> [Brownlee Transcript, February 21](#) at pg. 15851 – 15857, ll. 17 to 9.

<sup>34</sup> [Brownlee Transcript, February 21](#) at pg. 15852 – 15853, ll. 11 to 10.

<sup>35</sup> [Examination of Brian Malone, dated May 30, 2022](#) [“**Malone Transcript, May 30**”] at pg. 3267, ll. 2 to 8.

over three decades of experience as a traffic safety professional, including serving as the Vice President of Transportation at CIMA, the City's safety consultants.<sup>36</sup>

44. Mr. Brian Malone was examined on the effect of knowing the actual design speed of 110 km/h. Mr. Malone confirmed that a design speed of 110 km/h would not have impacted the recommendations made by CIMA in its safety review of the Red Hill in 2015 nor would it have impacted CIMA's understanding of the cause of wet weather collisions on the Red Hill.<sup>37</sup> This is discussed further in Section 3.
45. Consistent with Mr. Malone's evidence, Mr. Karim confirmed that a design speed of 100 km/h versus 110 km/h would not change CIMA's conclusions. On cross-examination, Mr. Karim acknowledged that while there would certainly be a difference in magnitude respecting the percentage for "at or exceeding the design speed", he would not expect a change in the overall recommendations because of that difference.<sup>38</sup> This makes sense. As explained above, the data showing that operating speeds exceeding posted speeds was sufficient to evidence the excessive speeding on the Red Hill.
46. What is more, much of the analysis in the 2015 CIMA report was based on information separate from and which did not change based on design speed, such as collision characteristics and pavement signage and markings, among other elements.

*c. Managing driver expectations on the Red Hill*

47. Expectancy violations refer to the expectation of drivers that are formed by what they see on the roadway, in the surrounding environment and their past experiences as drivers.<sup>39</sup>
48. Despite following the MTO Design Guide, Mr. Brownlee asserts that various expectancy violations may arise for some drivers with respect to the design speed, curvature and

---

<sup>36</sup> [Malone Transcript, May 30](#) at pg. 3269 [Malone Transcript, May 30](#) at pg. 3265 – 3266, ll. 20 to 5.

<sup>37</sup> [Examination of Brian Malone, dated October 31, 2022](#) ["**Malone Transcript, October 31**"] at pg. 14808 – 14810, ll. 20 to 15, pg. 14943 – 14948, ll. 10 to 7; [Examination of Brian Malone, dated May 31, 2022](#) ["**Malone Transcript, May 31**"] at pg. 3558-3560, ll.11 to 8; [Examination of Brian Malone, dated September 23, 2022](#) ["**Malone Transcript, September 23**"] at pg. 10815-10816, ll. 2 to 6.

<sup>38</sup> [Karim Transcript, February 23](#) at pg. 16186, ll. 2 to 14.

<sup>39</sup> [Brownlee Transcript, February 21](#) at pg. 15872, ll. 18 to 23.

interchange spacing on the Red Hill. On the other hand, Mr. Brownlee admits that expectancy violations may not have any effect on drivers.<sup>40</sup>

49. Mr. Karim states that driver expectations are adjusted by the observance and recognition of the local conditions and attributes of an urban freeway such as the Red Hill, which differs from the attributes of a 400-series highway.<sup>41</sup> Mr. Brownlee disputes this point.
50. A common and accepted method of actively managing driver expectations is through erecting signage. This is evident on the Red Hill.<sup>42</sup> Drivers on the Red Hill will see appropriate speed limit signs and placement of speed limit signs close to physical attributes such as a curve which serve to inform the driver of constrained conditions on an urban freeway.<sup>43</sup> In addition to speed limit signs, the presence of speed enforcement influenced driver behaviour by causing them to reduce their speed.<sup>44</sup>
51. The effectiveness of using signage and speed enforcement to manage driver behaviour is evident from the countermeasures recommended in the 2015 CIMA Report, including speed enforcement, installing oversized speed limit signs, installing oversize curve warning signs and installing merge signs.<sup>45</sup>
52. Further, as expectation is interrelated with knowledge and experience, Mr. Brownlee admitted that driver expectation is managed by familiarity with the Red Hill. He noted that any alleged expectation violation is reduced or non-existent for local drivers and drivers who have previously driven on the Red Hill.<sup>46</sup>
53. Each of the measures described above function independently but also work together to manage driver behaviour and expectation. As Mr. Karim testified, only if the driver was

---

<sup>40</sup> [Brownlee Transcript, February 21](#) at pg. 15875 – 15876, ll. 14 to 12.

<sup>41</sup> [Karim Expert Report](#) at pg. 20; [Karim Transcript, February 23](#) at pg. 16088-16090, ll. 24 to 13.

<sup>42</sup> [Karim Expert Report](#) at pg. 20.

<sup>43</sup> [Brownlee Transcript, February 21](#) at pg. 15874, ll. 2 to 21; [Karim Expert Report](#) at pg. 20.

<sup>44</sup> [Brownlee Transcript, February 21](#) at pg. 15874, ll. 2 to 25.

<sup>45</sup> [HAM0024708\\_0001](#), Exhibit 007 at pg. 50.

<sup>46</sup> [Brownlee Transcript, February 21](#) at pg. 15876, ll. 13 to 25.

not provided with the information necessary to adjust their driving behaviour would expectations be violated.<sup>47</sup> This was not the case on the Red Hill.

**D. The Friction Levels on the Red Hill**

54. Pavement friction was a core focus of this public inquiry. This Inquiry heard evidence on pavement friction from numerous witnesses including City consultants, the Ministry of Transportation and pavement friction experts.

55. The following issues are addressed in the subsequent sections:

- a. What relationship, if any, exists between pavement friction and collisions, and in particular, with respect to wet road collisions;
- b. What is the applicable guideline to assess the friction values obtained on the Red Hill between 2007 and 2019;
- c. Whether the friction values obtained on the Red Hill revealed a safety concern;
- d. Were Golder or the MTO concerned about the friction values on the Red Hill;
- e. Whether reducing friction demand was appropriate to address collisions on the Red Hill;
- f. Whether the asphalt mix design and aggregate used on the Red Hill were acceptable;
- g. Whether the collision trends show that low pavement friction is causing a high proportion of wet road collisions and single motor vehicle collisions on the Red Hill; and,
- h. Whether pavement surface remedial measures were necessary.

---

<sup>47</sup> [Karim Transcript, February 23](#) at pg. 16088 - 16090, ll. 1 to 4.

***Only Mr. Hein Has Relevant Canadian Expertise with Friction Measurement and Management***

56. This Inquiry heard the bulk of the evidence on friction related matters from two experts:
- a. **Dr. Gerardo Flintsch** was retained by Commission Counsel. Dr. Flintsch is a Professor at the Department of Civil and Environmental Engineering at the Virginia Polytechnic Institute and State University.<sup>48</sup> Dr. Flintsch tendered a report dated April 2022 (the “**Flintsch Primer Expert Report**”)<sup>49</sup> and a report dated November 2022 (the “**Flintsch Expert Report**”).<sup>50</sup>
  - b. **Mr. David Hein** was retained by the City of Hamilton. Mr. Hein recently retired from his role as a Principal Engineer with Applied Research Associates Inc., an engineering consulting firm, where he practiced for 20 years. Mr. Hein tendered a report dated February 1, 2023 (the “**Hein Expert Report**”).<sup>51</sup>
57. Dr. Hassan Baaj also provided expert opinion on specific issues relating to the aggregate, including the polished stone values, used on the Red Hill. Dr. Baaj was retained by Golder. He is a Professor, Chair in Sustainable Pavement Engineering and Director of the Centre for Pavement and Transportation Technology at the University of Waterloo.<sup>52</sup> He tendered an expert report dated February 2023 (the “**Baaj Report**”).<sup>53</sup>
58. There is no dispute that Dr. Flintsch and Mr. Hein are both highly knowledgeable with respect to pavement friction matters. This Inquiry, however, is about an Ontario roadway and relevant Canadian expertise ought to have particular importance.

---

<sup>48</sup> [EXP0000073, Exhibit 012](#) at pg 3.

<sup>49</sup> [Dr. Gerardo Flintsch, Primer on Friction, Friction Management, And Stone Matrix Asphalt Mixtures, dated April 2022](#) [“**Flintsch Primer Expert Report**”] EXP0000189, Exhibit 013.

<sup>50</sup> [Report of Dr. Gerardo Flintsch, dated November 1, 2022](#) [“**Flintsch Expert Report**”] EXP0000191, Exhibit 220.

<sup>51</sup> [Mr. David Hein’s Report, dated February 1, 2023](#) [“**Hein Expert Report**”] HAM0064775\_0001, Exhibit 222 at pg. 3.

<sup>52</sup> See [GOL0007519, Exhibit 225](#) at pg 2.

<sup>53</sup> [Dr. Hassan Baaj’s Report, dated February 2023](#) [“**Baaj Expert Report**”] GOL0007517, Exhibit 224.

59. Dr. Flintsch agrees that he does not have Canadian experience with respect to friction measurement and management.<sup>54</sup> In contrast, Mr. Hein has extensive experience in friction management in Canada:
- a. In his 20-year employment with Applied Research Associates, Mr. Hein focused on pavement preservation work, including developing tools and guidelines, and developing the national guide for municipal pavement infrastructure in Canada;<sup>55</sup>
  - b. Mr. Hein has taught a number of technical courses, workshops, webinars and training, including on pavement friction and pavement preservation both in Canada and internationally;<sup>56</sup>
  - c. Mr. Hein developed a formal pavement friction management plan for asphalt and concrete pavements, and conducted pavement surface friction testing and collision analysis on Highway 407 near Toronto, Ontario;<sup>57</sup>
  - d. Mr. Hein managed detailed design and pavement structure selection of major design and build projects in British Columbia, Alberta, Ontario and New Brunswick;<sup>58</sup>
  - e. Mr. Hein conducted pavement surface friction testing and analysis on a number of roadways and highways in Ontario, including the Windsor Essex Parkway and roadways in the Region of Durham;<sup>59</sup>
  - f. He has conducted friction testing with the ASTM E-274 Brake Force Trailer, the GripTester and the British Pendulum Tester in Canada;<sup>60</sup> and,

---

<sup>54</sup> Dr. Flintsch recognizes that Mr. Hein has superior knowledge with respect to friction management practices in a Canadian setting and admitted that he sought the expertise of Mr. Hein in preparing for the Inquiry. See [Examination of Gerardo Flintsch, dated February 16, 2023](#) [**“Flintsch Transcript, February 16”**] at pg. 15656-15657, ll. 14 to 24.

<sup>55</sup> [Examination of David Hein, dated February 24, 2023](#) [**“Hein Transcript, February 24”**] at pg. 16274 – 16275, ll. 21 to 10.

<sup>56</sup> For a more comprehensive list of Mr. Hein’s technical courses, workshops, webinars and training, see [Hein Expert Report](#) at A-16; [Hein Transcript, February 24](#) at pg. 16287, ll. 8 to 17.

<sup>57</sup> [Hein Expert Report](#) at A-3.

<sup>58</sup> [Hein Expert Report](#) at A-4.

<sup>59</sup> [Hein Expert Report](#) at A-3.

<sup>60</sup> [Hein Expert Report](#) at A-3 – A-4; [Hein Transcript, February 24](#) at pg. 16280-16281, ll. 8 to 24.

g. He has experience working with shotblasting, skidabrading and resurfacing techniques in Canada.<sup>61</sup>

60. Given his wide-ranging expertise, Mr. Hein was able to provide opinions informed by local practices and his experiences addressing pavement matters on other roadways in Ontario.

**ii. *Pavement Friction is Rarely the Main Cause of Collisions***

61. One of the key issues in this Inquiry is the role that friction plays in collisions.

62. Both friction experts agree that collisions are caused by a multitude of factors and that pavement friction is just one potential contributing factor. Importantly, Dr. Flintsch and Mr. Hein agree that deficient friction is seldom the main cause of a crash.<sup>62</sup>

63. The Hein Expert Report provides a table setting out the potential contributing factors of an accident.<sup>63</sup> Dr. Flintsch, Mr. Hein and Mr. Karim all agree that the factors contributing to collisions cannot be ranked in the aggregate: without an accident reconstruction, there is **no** basis to determine any order of contribution to a particular accident.<sup>64</sup>

Roadway Design	Pavement Characteristics	Traffic	Vehicle Operating Parameters
<ul style="list-style-type: none"> <li>• Alignment</li> <li>• Curves</li> <li>• Terrain</li> <li>• Number of access points</li> <li>• Interchanges/intersections</li> <li>• Signing and safety appurtenances</li> </ul>	<ul style="list-style-type: none"> <li>• Micro-texture</li> <li>• Macro-texture</li> <li>• Mega-texture (unevenness)</li> <li>• Lateral and side-force friction</li> <li>• Material Properties</li> <li>• Temperature</li> </ul>	<ul style="list-style-type: none"> <li>• Volume</li> <li>• Speed</li> <li>• Congestion</li> <li>• Percent trucks</li> <li>• Work-zones/construction</li> </ul>	<ul style="list-style-type: none"> <li>• Slip speed</li> <li>• Braking action</li> <li>• Driving maneuver               <ul style="list-style-type: none"> <li>○ Turning</li> <li>○ Overtaking</li> </ul> </li> </ul>

<sup>61</sup> [Hein Transcript, February 24](#) at pg. 16283 - 16286, ll. 7 to 24.

<sup>62</sup> [Flintsch Primer Expert Report](#) at pg. 19; [Flintsch Transcript, February 16](#) at pg. 15539, ll. 9 to 14; [Hein Expert Report](#) at pg. 16.; [Hein Transcript, February 24](#) at pg. 16317 - 16318, ll. 10 to 15.

<sup>63</sup> [Hein Expert Report](#) at pg. 7.

<sup>64</sup> [Hein Expert Report](#) at pg. 17; [Flintsch Expert Report](#) at pg. 27; [Karim Expert Report](#) at pg. 21-22.



Tire Properties	Environment	Visual Distractions	
<ul style="list-style-type: none"> <li>• Footprint</li> <li>• Tread design and condition</li> <li>• Rubber composition and hardness</li> <li>• Inflation pressure</li> <li>• Load</li> </ul>	<ul style="list-style-type: none"> <li>• Temperature</li> <li>• Climate <ul style="list-style-type: none"> <li>○ Wind</li> <li>○ Temperature</li> <li>○ Water (rainfall, condensation)</li> <li>○ Snow and Ice</li> <li>○ Contaminants <ul style="list-style-type: none"> <li>• Anti-skid material (salt, sand)</li> <li>• Dirt, mud, debris</li> </ul> </li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Glare</li> <li>• Nighttime driving conditions</li> </ul>	

*a. Primary contributory causes of wet road collisions*

64. Dr. Flintsch and Mr. Hein agree that pavement friction is not the primary contributory cause of wet road crashes in any general sense.<sup>65</sup>
65. Dr. Flintsch and Mr. Hein considered whether the four factors—slipperiness (i.e. friction), speed, curves and proximity of ramps—identified by Mr. Malone of CIMA as contributing to wet road collisions, could be ranked in terms of contribution order. Neither expert agreed that those factors could be ranked.<sup>66</sup>
66. To rank contributory factors, Dr. Flintsch testified that “scientific evidence” would be necessary<sup>67</sup> and that an accident reconstruction is required to determine the relative contribution of the causal factors.<sup>68</sup> Mr. Hein agreed.<sup>69</sup>
67. Scientific evidence with respect to key contributory factors of wet road crashes can be found in the Highway Safety Manual (the “HSM”).<sup>70</sup> The HSM was developed in 2010. It provides transportation professionals with quantitative information about crash analysis and evaluation. One of the purposes of the HSM is to identify the key contributing factors of a particular crash type.

<sup>65</sup> [Hein Expert Report](#) at pg. 16; [Flintsch Expert Report](#) at pg. 19.

<sup>66</sup> [Flintsch Expert Report](#) at pg. 27; [Flintsch Transcript, February 16](#) at pg. 15622-6, ll. 16 to 5; [Hein Expert Report](#) at pg. 16; [Hein Transcript, February 24](#) at pg. 16343, ll. 3 to 13.

<sup>67</sup> [Flintsch Expert Report](#) at pg. 27.

<sup>68</sup> [Flintsch Transcript, February 16](#) at pg. 15626, ll. 6 to 12; [Hein Transcript, February 24](#) at pg. 16314, ll. 2 to 13.

<sup>69</sup> [Hein Expert Report](#) at pg. 61.

<sup>70</sup> [HAM0064754\\_0001, Exhibit 229](#) at pg. 6-3.

68. With respect to wet road crashes, the HSM does not identify “slippery pavement” as one of the top four key contributory factors.<sup>71</sup> As Mr. Karim testified, the HSM information is based on statistical models developed from an entire database of information from the United States and Canada. What these statistical models show is that pavement slipperiness is not considered to be one of the top four key contributory factors of wet road crashes.<sup>72</sup> This conclusion is consistent with the proposition that low deficient friction is rarely the main cause of a collision.
69. Contrary to statistical models and the friction experts’ views discussed above, Mr. Brownlee concluded that reduced road surface friction is *the* primary (i.e. highest ranking) contributory cause of overrepresentation of wet road crashes. However, Mr. Brownlee admitted that he did not actually conduct an overrepresentation analysis of wet weather collisions on the Red Hill.<sup>73</sup> Instead, Mr. Brownlee relied on CIMA’s five-year collision analysis which compared the Red Hill collision rates with provincial and municipal averages, which are taken from a broad analysis of all types of roads – not comparator roadways.<sup>74</sup>
70. As Mr. Brownlee admitted on cross-examination, when assessing whether there is an overrepresentation of specific collision attributes for wet weather collisions, one would look at whether there is an inordinate frequency of a specific collision attribute when compared to peer transportation facilities.<sup>75</sup> A peer facility is a roadway with similar characteristics as to the one that is being investigated.<sup>76</sup> For that reason, a comparison with provincial and municipal averages, which is an aggregation of all road types and not peer facilities, is not a proper overrepresentation analysis.

---

<sup>71</sup> [HAM0064754\\_0001, Exhibit 229](#) at pg. 6-5.

<sup>72</sup> Mr. Brownlee testified that in the HSM, “pavement design” is listed as a key contributory factor of wet road crashes and that “pavement friction” (or low friction) falls within the definition of “pavement design”. There is no support for that statement within the HSM. “Slippery pavement” is separately identified as a key contributory factor for other crash types. See [HAM0064754\\_0001, Exhibit 229](#) at pg. 6-5.

<sup>73</sup> [Brownlee Transcript, February 21](#) at pg. 15865, ll. 1 to 6.

<sup>74</sup> [Brownlee Transcript, February 21](#) at pg. 15864 – 15865, ll. 17 to 17.

<sup>75</sup> [Brownlee Transcript, February 21](#) at pg. 15863 – 15864, ll. 21 to 16; [Brownlee Expert Report](#) at pg. 29, footnote 58.

<sup>76</sup> [Brownlee Transcript, February 21](#) at pg. 15860, ll. 14 to 22.

71. Given the opinion of the friction experts, the scientific information on contributory factors to wet road crashes, and the lack of an overrepresentation analysis, the opinions of Dr. Flintsch and Mr. Hein should be preferred over Mr. Brownlee's opinion on this point.

*iii. Use of FN(90)R=30 is Reasonable*

72. One of the issues to be addressed in this Inquiry is the interpretation of friction values and the appropriate guideline to be applied in doing so. To that end, numerous witnesses testified with respect to FN(90)R=30, which, as described below, is used in Ontario for the friction measurement instrument called the "locked-wheel tester", and the investigatory level guidelines of the United Kingdom (the "**UK Guidelines**"), which was developed for the friction measurement tool called the "GripTester".

73. In Canada, there are no published national or provincial standards or guidelines with respect to friction measurement or management.<sup>77</sup> There are also no policies or standards that require or encourage the measurement or management of pavement skid resistance and macrotexture on road networks or setting friction investigatory or intervention levels.<sup>78</sup>

74. As discussed further below, FN(90)R=30 is the appropriate lens through which to view the friction results on the Red Hill. FN(90)R=30 (which will be referred to as "FN30" for simplicity hereinafter) is an unpublished investigatory level used by the MTO. On that investigatory level, friction values of 30 or greater measured at 90 km/h with a ribbed tire on a locked wheel tester are an acceptable friction value. Friction values below 30 may merit further investigation.<sup>79</sup>

75. Mr. Hein is the only friction expert that provided an opinion on the applicability of FN30 in evaluating the friction results on the Red Hill. Dr. Flintsch did not opine on the use of FN30 and importantly, he has not suggested that FN30 should not be used as an

---

<sup>77</sup> [RHV0000932, Exhibit 11](#) at pg. 1.

<sup>78</sup> [Hein Expert Report](#) at pg. 4; [RHV0000932, Exhibit 11](#) at pg. 1.

<sup>79</sup> [Hein Expert Report](#) at pg. 5.

investigatory level.<sup>80</sup> From a safety perspective, Dr. Flintsch was unable to comment on whether a road could be deemed unsafe if the friction value was below FN30.<sup>81</sup>

76. Mr. Hein's opinion is that FN30 is an acceptable investigatory level that may initiate a more detailed evaluation of pavement surface friction and its potential contribution to vehicle crashes on the Red Hill.<sup>82</sup> In support of this view, Mr. Hein relied on the following:
- a. FN30 is the prevailing guideline applied by the industry in respect of roadway friction in Ontario;<sup>83</sup>
  - b. FN30 is a conservative benchmark given that it tests at the posted speed (e.g. 90 km/h on the Red Hill) rather than 65 km/h, which is the standard under ASTM E274. A lower testing speed typically results in a higher friction value;<sup>84</sup>
  - c. As Ontario highways are assessed against FN30, the application of FN30 on the Red Hill would permit proper comparisons with other highways;<sup>85</sup> and,
  - d. Other transportation agencies, such as those in the U.S., use different investigatory levels. Those investigatory levels range from FN23 to FN36. FN30 falls in the middle of that range which reflects the reasonableness of the investigatory level.<sup>86</sup>
77. Given the prevailing application of FN30 in Ontario, Mr. Hein opines that there is no reason to rely on the U.K. Guidelines.<sup>87</sup> The U.K. Guidelines were developed for the local conditions and specific environment in the U.K. and based on specific asphalt mix designs, aggregate quality, vehicle types, weather conditions and other factors.<sup>88</sup> It is therefore inappropriate to apply investigatory levels developed elsewhere. In his decades working as

---

<sup>80</sup> [Flintsch Transcript, February 16](#) at pg. 15660 – 15661, ll. 16 to 14.

<sup>81</sup> [Flintsch Transcript, February 16](#) at pg. 15661, ll. 1 to 14.

<sup>82</sup> [Hein Expert Report](#) at pg. 2.

<sup>83</sup> [Hein Expert Report](#) at pg. 9.

<sup>84</sup> [Hein Expert Report](#) at pg. 2; [Hein Transcript, February 24](#) at pg. 16288 - 16299, ll. 19 to 15.

<sup>85</sup> [Hein Expert Report](#) at pg. 2.

<sup>86</sup> [Hein Expert Report](#) at pg. 2.

<sup>87</sup> [Hein Expert Report](#) at pg. 12.

<sup>88</sup> [Hein Expert Report](#) at pg. 12.

a pavement engineer, Mr. Hein has not seen the U.K. Guidelines used by a Canadian transportation agency for evaluating friction values on a roadway in Canada.<sup>89</sup>

78. In examination, Dr. Flintsch agreed that an evaluation of its application in Ontario would be required before adopting the investigatory levels set out in the U.K. Guidelines.<sup>90</sup> Although Dr. Flintsch accepts the inapplicability of the U.K. Guidelines to other jurisdictions with different local conditions, Dr. Flintsch nevertheless supports its use as a reference point for GripTester results taken in Ontario.<sup>91</sup> This view, however, is inconsistent with his own opinion that evaluation of local conditions is required before relying on the U.K. Guidelines. Given its unproven application, Mr. Hein does not support the reliance on the U.K. Guidelines.<sup>92</sup>

*iv. **Red Hill Friction Levels Were Acceptable Using FN30***

79. Friction testing was conducted on the Red Hill variously between 2007 and 2019. This Inquiry received evidence regarding those friction results taken on the Red Hill from a variety of witnesses including Mr. Hein, Dr. Flintsch, MTO witnesses, Golder and Tradewind.
80. What the totality of the evidence reveals is that with almost annual friction testing conducted on the Red Hill, the City was never advised of any safety concern related to friction levels on the Red Hill. When the friction results are examined under FN30, the conclusion is that the friction results for those years were acceptable.

*a. **Expert evaluation of Red Hill friction values***

81. Mr. Hein and Dr. Flintsch interpreted the friction testing results of the Red Hill from 2007 to 2019. While Dr. Flintsch concluded that the friction results were “relatively low”, Mr. Hein’s view is that the friction levels are acceptable in Ontario.<sup>93</sup> What differs between their approach is that Mr. Hein’s opinion is informed by his understanding of friction values

---

<sup>89</sup> [Hein Transcript, February 24](#) at pg. 16360 – 16361, ll. 19 to 2; [Hein Expert Report](#) at pg. 12.

<sup>90</sup> [Flintsch Transcript, February 16](#) at pg. 15585, ll. 7 to 19; [Hein Transcript, February 24](#) at pg. 16334 – 16335, ll. 16 to 6.

<sup>91</sup> [Flintsch Transcript, February 16](#) at pg. 15583 – 15585, ll. 19 to 6.

<sup>92</sup> [Hein Expert Report](#) at pg. 13.

<sup>93</sup> [Hein Transcript, February 24](#) at pg. 16292, ll. 11 to 24.

on other Ontario roadways and based on the application of the local investigatory level, FN30.

82. In Mr. Hein’s opinion, the Red Hill friction results in the aggregate from 2007 to 2019 showed a typical trend for SMA—the early friction numbers are a little low, but after the asphalt is worn off in the first year under traffic, the friction numbers increase. Due to factors such as traffic, the friction numbers then decreased and leveled out on average above FN30 in 2013/2014.<sup>94</sup> This trend reflects what is typical of those aggregates and what would be expected of any asphalt in Ontario.<sup>95</sup> Similarly, Dr. Baaj opined that the reduction from 2008 to 2014 is within the norm for paving projects with similar materials and service lives.<sup>96</sup> It is important to note that, as Mr. Hein emphasized, a decline in friction does not result in the roadway being unsafe and that roads with low friction can operate safely.<sup>97</sup>
83. In late November 2013, Tradewind performed friction testing using the GripTester and provided Golder with its report on the friction values and recommendations based on the U.K. Guidelines (the “**Tradewind Report**”).<sup>98</sup>
84. Regarding the Tradewind Report, Mr. Hein testified that:
- a. Had he received the GripTester friction results from Tradewind at that time,<sup>99</sup> he would have looked at the friction numbers for relative differences and significant deviations from each other. In his view, the friction numbers did not show any significant deviations.<sup>100</sup>
  - b. He would not be making any action decisions with respect individual friction values measured by the GripTester. There does not exist an applicable standard to measure

---

<sup>94</sup> [Flintsch Expert Report](#) at pg. 7, 19; [Hein Transcript, February 24](#) at pg. 16300 - 16301, ll. 15 to 4.

<sup>95</sup> [Hein Transcript, February 24](#) at pg. 16301, ll. 5 to 19.

<sup>96</sup> [Baaj Expert Report](#) at pg. 25.

<sup>97</sup> [Hein Transcript, February 24](#) at pg. 16301 - 16302, ll. 5 to 2.

<sup>98</sup> [GOL0001113, Exhibit 6](#).

<sup>99</sup> [GOL0001113](#) at pg. 17-18, [Exhibit 6](#) at pg. 78. It is worth noting that had Mr. Hein been asked to conduct the friction testing, he would have used the locked wheel tester as it is the only device where there is an established reference is available.

<sup>100</sup> [Hein Transcript, February 24](#) at pg. 16296-16298, ll. 17 to 5.

them against in Canada.<sup>101</sup> On cross-examination, Mr. Hein did not agree that locked wheel test results would have returned a lower friction number than the results obtained by Tradewind.<sup>102</sup> This is consistent with the subsequent locked-wheel test results (i.e. 2014 and 2019) before resurfacing on the Red Hill.

- c. He might have undertaken a field inspection of the few approximate locations which had a couple of friction values in the 20s on the basis that they differ from the other values. That field inspection would be to look for anomalies on the roadway such as dips or bumps that could potentially explain the value.<sup>103</sup>
- d. He would not have linked the occurrence of wet weather accidents on the Red Hill with those values in the 20s. The approximate locations of the friction values in the 20s obtained by Tradewind were outside of the limits of the 2013 CIMA Report, which was between Dartnall Road and Greenhill Avenue.<sup>104</sup>
- e. Additional friction testing was not necessary because he was not concerned by the friction values. Had additional friction testing been conducted (which he may have undertaken the following year in any event), Mr. Hein would have used the locked wheel tester. He believed that these results would have been similar to the results obtained by the MTO in 2014. In his view, the 2014 friction results were acceptable for an Ontario highway.<sup>105</sup>

85. There appears to be broad agreement by the experts that the friction results stabilized at least as of 2014 on the Red Hill. No friction testing was then conducted until 2019.<sup>106</sup> For that reason, Mr. Hein placed particular importance on the 2019 friction results taken by ARA on the Red Hill. The 2019 results are the most comprehensive friction dataset taken

---

<sup>101</sup> [Hein Transcript, February 24](#) at pg. 16296 - 16298, ll. 17 to 5.

<sup>102</sup> [Hein Transcript, February 24](#) at pg. 16402, ll. 19-1.

<sup>103</sup> [Hein Transcript, February 24](#) at pg. 16295 - 96, ll. 12 to 2.

<sup>104</sup> [Hein Transcript, February 24](#) at pg. 16299, ll. 4 to 19.

<sup>105</sup> [Hein Transcript, February 24](#) at pg. 16407 - 8 at ll. 5 to 24, pg. 16418 – 16419, ll. 20 to 16, pg. 16300 - 16301, ll. 9 to 4.

<sup>106</sup> [Hein Expert Report](#) at pg. 5.

before the resurfacing of the Red Hill in mid-2019.<sup>107</sup> The 2019 results confirm his view that the friction results did not suggest a friction problem.<sup>108</sup>

86. The Hein Expert Report summarizes the 2019 ARA friction results which are excerpted below:<sup>109</sup>

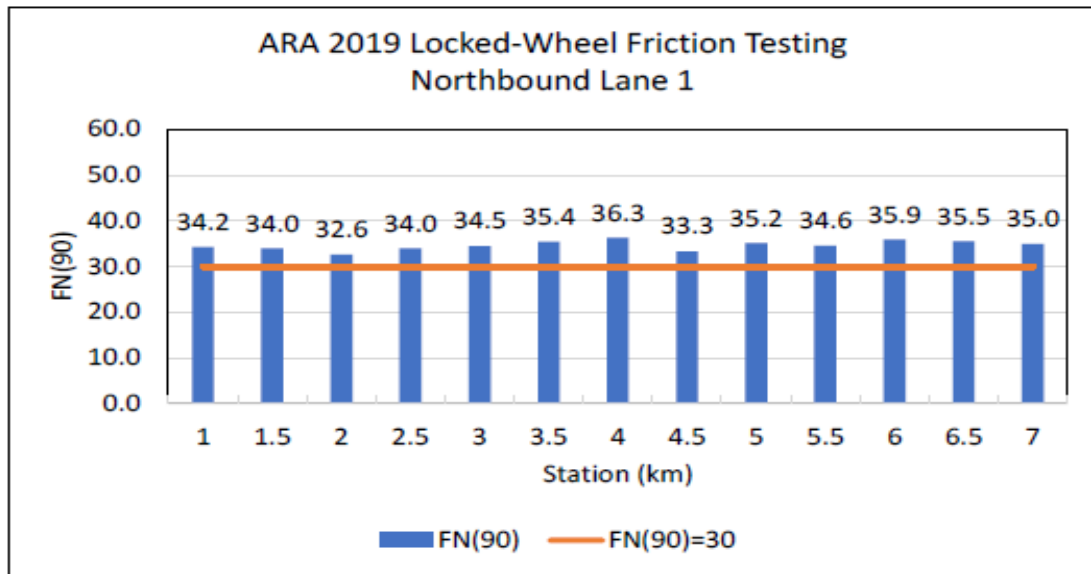


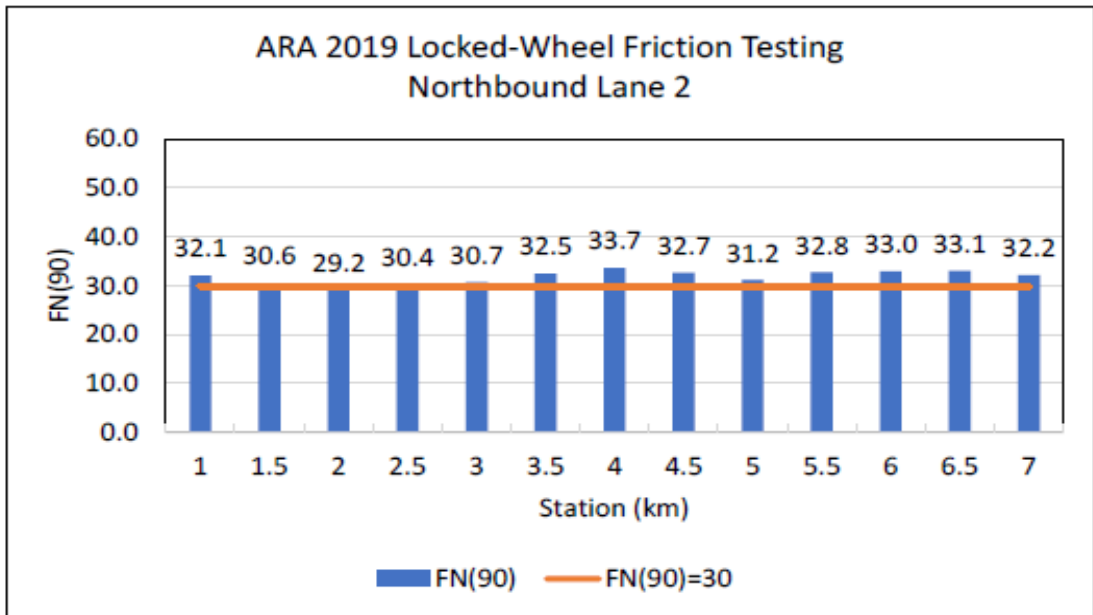
Figure 2. Northbound Lane 1

<sup>107</sup> [Hein Transcript, February 24](#) at pg. 16306, ll. 17 to 20.

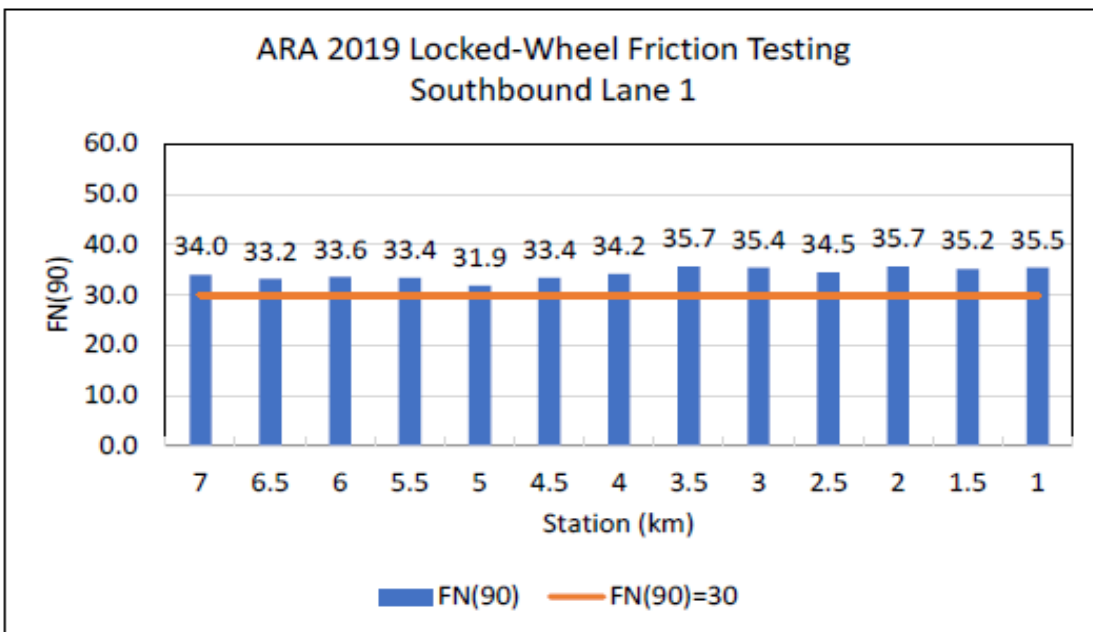
<sup>108</sup> [Hein Transcript, February 24](#) at pg. 16308, ll. 19 to 23.

<sup>109</sup> [Hein Expert Report](#) at pg. 5 – 6 for Figures 2 - 4; [HAM00064785](#), Exhibit 222A for Figure 5.

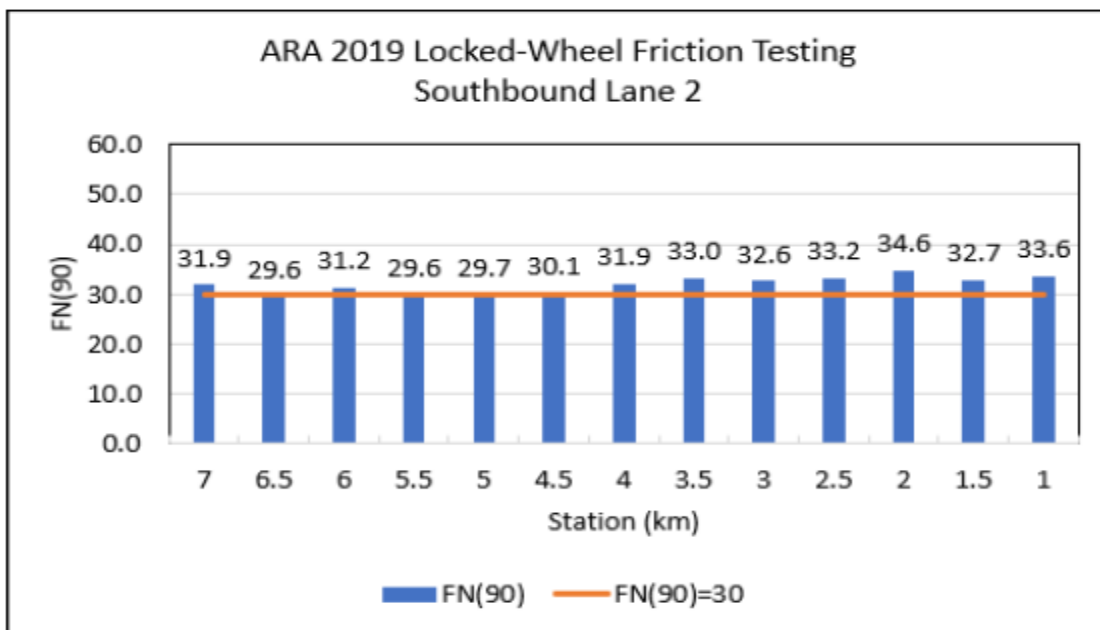




**Figure 3. Northbound Lane 2**



**Figure 4. Southbound Lane 1**



**Figure 5. Southbound Lane 2**

87. With FN30 as the prevailing guidance, Mr. Hein reviewed the 2019 results for any outliers and values below an average friction value of 30. As shown above, there were values just below 30 in the Northbound Lane 2 (Figure 3) and Southbound Lane 2 (Figure 5):
- a. With respect to Northbound Lane 2, there is an average value of 29.2. Mr. Hein testified this average value is an outlier. He viewed this average value in the context of the rest of the results which are above 30 and substantially similar to each other. An average value of 29.2 is a minor variance and did not raise any concerns.<sup>110</sup>
  - b. With respect to Southbound Lane 2, the values below 30 at the 6.5 km (i.e. 29.6), 5.5 km (i.e. 29.7) and 5 km (i.e. 29.7) marks are again just below 30. Although just barely below 30, Mr. Hein testified that he may conduct a visual inspection of the location due to the consecutive values. However, in his view, there are no obvious trends in the friction data that suggest there is a localized friction problem on the Red Hill.<sup>111</sup>

<sup>110</sup> [Hein Transcript, February 24](#) at pg. 16307 - 16308, ll. 12 to 18.

<sup>111</sup> [Hein Transcript, February 24](#) at pg. 16310 - 16311, ll. 16 to 6.

88. As noted above, FN30 is an investigatory level such that a number below 30 may initiate investigation. Mr. Hein has emphasized that FN30 is “not cast in stone”.<sup>112</sup> Values that are below 30 *may* merit further investigation and that there is room for discretion and engineering judgment in applying FN30.<sup>113</sup> There is no inconsistency in this approach as appears to be suggested on cross-examination by Commission Counsel. Here, Mr. Hein testified that following his review, the Red Hill friction values are not 20 (or in the low 20s), which would be concerning, and that there is no obvious trend that suggests a friction problem, particularly as the friction values had levelled out and the average friction values are nearly all above 30.<sup>114</sup>
89. It is worth emphasizing for completeness that even low friction values do not necessarily equate to higher risks to drivers. Mr. Hein testified that in certain locations where he has seen friction numbers in the low 20s on an Ontario highway, it was determined that friction had nothing to do with any of the collisions after a thorough investigation was conducted.<sup>115</sup>
90. In short, applying his experience with friction on other Canadian roadways and his review of the historical friction data on the Red Hill, Mr. Hein’s opinion is that the friction values were acceptable and did not raise any safety concerns.<sup>116</sup>

***b. Unreliability of interconversion from GripTester values to Locked Wheel values***

91. Dr. Flintsch draws the conclusion that the 2014 MTO testing results and the Tradewind results are consistent and show relatively low average friction levels. To draw this conclusion, he employs an untested four step conversion from GripTester Number (“GN”) to Friction Number (“FN”).<sup>117</sup>
92. Dr. Flintsch believes that his conversion is reasonably accurate because the converted values agree with the locked-wheel measurements. However, the Flintsch Primer Expert

---

<sup>112</sup> [HAM00064785](#), Exhibit 222A for Figure 5. [Hein Transcript, February 24](#) at pg. 16308 – 16309, ll. 25 to 15.

<sup>113</sup> [Hein Transcript, February 24](#) at pg. 16414 - 1615, ll. 16 to 15.

<sup>114</sup> [Hein Transcript, February 24](#) at pg. 16308, ll. 5 to 18.

<sup>115</sup> [Hein Transcript, February 24](#) at pg. 16317 - 16218, ll. 10 to 15.

<sup>116</sup> [Hein Transcript, February 24](#) at pg. 16292, ll. 11 to 24; [Hein Expert Report](#) at pg. 19, 21.

<sup>117</sup> [Flintsch Expert Report](#) at pp. 18-19.

Report is clear that interconversions between the GripTester and locked-wheel tester measurements are “not very accurate and may not apply to pavements not included in their development”<sup>118</sup> and reliability is dependent on various factors like the testing device used, the operator, the driver, the variation on pavement surfaces, and other factors.<sup>119</sup> When cross-examined on one of the equations used in his ad hoc approach, Dr. Flintsch agreed that the SMA test section was not included in the development of that equation.<sup>120</sup> Ultimately, he does not heed his own warnings and applies the formula.

93. Mr. Hein is unable to accept the reliability of the conversion. He points to authoritative studies that emphasize the unreliability of conversions<sup>121</sup> and historical work that has shown the unreliability of conversions from GN to FN.<sup>122</sup> These concerns were not resolved by Dr. Flintsch. Coupled with the lack of engineering rigor, Mr. Hein concluded that the result was just fortuitous.<sup>123</sup> His opinion should be preferred over Dr. Flintsch.

*c. MTO did not express safety concerns*

94. In this Inquiry, MTO witnesses testified on numerous friction and pavement related topics. In particular, the MTO provided insight into the use of FN30 and the friction results taken by the MTO on the Red Hill variously from 2007 to 2014.
95. Consistent with Mr. Hein’s evidence, the MTO witnesses’ evidence confirmed that with respect to FN30, if friction values are below 30, further investigation may be merited. As examples:
- a. Mr. Tom Kazmierowski<sup>124</sup> testified that FNs that are 30 and above are acceptable and that below 30 to 25 require monitoring and *perhaps* investigation. Below that range, investigation and action are warranted. He further notes that other attributes

---

<sup>118</sup> [Flintsch Primer Expert Report](#) at pg. 16.

<sup>119</sup> [EXP0000034, Exhibit 228](#) at p. 14.

<sup>120</sup> [Flintsch Transcript, February 16](#) at pg. 15679, ll. 6-25.

<sup>121</sup> [Hein Expert Report](#) at pg. 14-15.

<sup>122</sup> [EXP0000013, Exhibit 227](#) at pg. 25; [Hein Transcript, February 24](#) at pg. 16338-16339, ll. 13-16.

<sup>123</sup> [Hein Transcript, February 24, pg. 16337-38, ll. 13-12; Hein Expert Report](#) at pg. 15.

<sup>124</sup> Senior Manager of the Materials Engineering and Research Office (“**MERO**”) (2007-2012).

should be considered including the aggregate type, mix design, geometrics, environmental conditions, and other factors.<sup>125</sup>

- b. Ms. Becca Lane<sup>126</sup> explained that a FN of 30 or above is considered acceptable. If the average FN is less than 30 that *might* be an opportunity to investigate the roadway and see if there are any issues. An investigation would include assessing the friction demand of the roadway.<sup>127</sup>

96. Consistent with Mr. Hein’s evidence, various MTO witnesses testified that the friction results were acceptable. As examples:

- a. Ms. Becca Lane testified that she was seeing FNs less than 20 and in the low 20s on another highway. In her view, the Red Hill friction numbers were “good”.<sup>128</sup>
- b. Mr. Stephen Senior<sup>129</sup> testified that the 2008 to 2014 friction results showed that the averages became more constant over time and were levelling off at a value in the low 30s. The average was very similar to other designated source material trap rocks and was comparable to a few existing pavements.<sup>130</sup>
- c. Mr. Chris Rogers<sup>131</sup> testified that the FNs on the Red Hill in the 2007 testing looked very good compared to the data they had been getting on the 401.<sup>132</sup> The 2014

---

<sup>125</sup> [Examination of Tom Kazmierowski, dated May 18, 2022](#) [“Kazmierowski Transcript, May 18”] at pg. 2402, ll. 5 to 22.

<sup>126</sup> Senior Pavement Design Engineer in the Pavements and Foundations Section of MERO (2003-2007); Head of the Pavements and Foundation Section (2008-2011); Manager of the Systems Analysis and Forecasting Office (2011-2013); and Manager of MERO (2013-2020).

<sup>127</sup> [Examination of Rebecca Lane, dated May 16, 2022](#) [“Transcript, May 16”] at pg. 1956 – 1957, ll. 12 to 6.

<sup>128</sup> [Lane Transcript, May 16](#) at pg. 57 to 59.

<sup>129</sup> Engineer at MTO (1986); Geological Engineer in Soils and Aggregates Section of MERO (1986-1989), Senior Geological Engineer in Soils and Aggregates Section of MERO (1989-2008), Acting Head of Soils and Aggregates Section (2008); Head of Soils and Aggregates Section of MERO (2008-2016).

<sup>130</sup> [Examination of Stephen Senior, dated May 17, 2022](#) [“Senior Transcript, May 17”] at pg. 2824 – 2825, ll. 8 to 8.

<sup>131</sup> Petrographer in the Soils and Aggregates Section of MERO (1976-1990); Manager of Soils and Aggregates Section of MERO (1990-2008).

<sup>132</sup> [MTO0002228](#) at pg. 1, Exhibit 004.

results showed averages just above 30, which are values that were quite satisfactory from the MTO perspective.<sup>133</sup>

97. From a safety perspective, the MTO witnesses' evidence confirmed that the friction results did not raise any safety concerns.<sup>134</sup> They further confirmed that if the MTO had safety concerns regarding the friction values, they would have taken steps to notify the City or its representatives.<sup>135</sup> There is no internal policy that prevents an employee from raising safety concerns arising from testing to the appropriate entity (e.g. a municipality)<sup>136</sup> and the MTO would not remain idle if there were in fact safety concerns observable in the friction values.<sup>137</sup>

*d. Golder did not express safety concerns*

98. Golder was a pavement consultant hired by the City to evaluate the Red Hill. Like the MTO, Golder did not express to the City that a safety concern existed on the Red Hill or that a safety concern would arise if certain remedial actions were not taken between 2007 and 2019.
99. Specifically, the evidence reflects that:
- a. Dr. Uzarowski was not concerned with the friction results taken by the MTO in 2007. He viewed those results to be acceptable and did not raise any concerns with the City or its representatives.<sup>138</sup>

---

<sup>133</sup> [Examination of Chris Rogers, dated May 19, 2022](#) [**“Rogers Transcript, May 19”**] at pg. 2578 – 2579, ll. 6 to 18.

<sup>134</sup> [Examination of Frank Marciello, dated May 24, 2022](#) [**“Marciello Transcript, May 24”**] at pg. 2752 – 2754, ll. 7 to 6; [Kazmierowski Transcript, May 18](#) at pg. 2391, ll. 7 to 24; [Lane Transcript, May 16](#) at pg. 2093 – 2094, ll. 23 to 5, [Examination of Rebecca Lane, dated May 17, 2022](#) [**“Lane Transcript, May 17”**] at pg. 2244 – 2248, ll. 14 to 4.

<sup>135</sup> [Marciello Transcript, May 24](#) at pg. 2752, ll. 13 to 20; [Kazmierowski Transcript, May 18](#) at pg. 2462, ll. 11 to 16, [Lane Transcript, May 16](#) at pg. 1950, ll. 13 to 18.

<sup>136</sup> [Marciello Transcript, May 24](#) at pg. 2847 – 2848, ll. 10 to 1; [Kazmierowski Transcript, May 18](#) at pg. 2446, ll. 17 to 24.

<sup>137</sup> [Senior Transcript, May 24](#) at pg. 2753 – 2754, ll. 21 to 6.

<sup>138</sup> [Examination of Ludomir Uzarowski, dated April 29, 2022](#) [**“Uzarowski Transcript, April 29”**] at pg. 571 to 573, ll. 1 to 8, pg. 577, ll. 12 to 18.

- b. Neither the Draft Golder Report nor the Tradewind Report expressed any safety concern on the Red Hill. Excerpted below are the key paragraphs from the Tradewind Report and Draft Golder Report, respectively:<sup>139</sup>

Tradewind Report:

**V. Conclusions and Recommendations**

In conclusion, the overall friction averages as measured by the GripTester on the designated lanes and sections of the Lincoln Alexander Parkway were *comparable to or above* the relevant UK Investigatory Level. The relatively consistent friction values across the different lane positions and along the full length of this facility indicate a generally uniform pavement surface texture and composition, with limited variation due to vehicular traffic wear.

However, the overall friction averages as measured by the GripTester on the designated lanes and sections of the Red Hill Valley Parkway were *below or well below* the same UK Investigatory Level 2. The overall low levels and the variability of friction values along the length of the Parkway indicate the need for a further examination of the pavement surface, composition and wear performance. It should be noted that, in addition to the overall low average Grip Number levels on this facility, there are some localized sections with quite low friction values, reaching 27-30 in several areas. We recommend that a more detailed investigation be conducted and possible remedial action be considered to enhance the surface texture and friction characteristics of the Red Hill Valley Parkway, based on the friction measurements recorded in the current survey.

Draft Golder Report:

In order to remedy the longitudinal top down cracking, it is recommended that the surface course SMA be milled and a new surface course mix be placed at selected locations. At a minimum the milling and overlaying should be carried out on sections where the most frequent top down cracking is observed. Based on our pavement visual condition inspection, the minimum total length of the sections where mill and overlay is required would be about 2.5 km. The exact locations for the milling and overlaying should be determined on site. It is also recommended that if there is any debonding of the underlying SP 19.0 layer observed during the milling and overlaying operation, the debonded SP 19.0 layer should also be removed.

On the remaining portion of the RHVP, the existing cracks in the surface course should be routed and sealed to prevent the ingress of water and incompressible material into the pavement structure. Following the routing and sealing, it is recommended that a single layer of microsurfacing be applied. By carrying out the mill and overlay where required and applying microsurfacing, the issue of relatively low FN on the RHVP would also be addressed. The new surface course mix to be used on the RHVP should incorporate aggregates that have good Polished Stone Value (PSV). It is recommended that the PSV of potential aggregate sources be tested in the laboratory.

The cracks in the paved shoulder along the edge of the driving lanes should also be routed and sealed to stop the ingress of water.

- c. Dr. Uzarowski did not see any red flags with the friction results when he was preparing the Draft Golder Report in 2014. The friction results were very similar

---

<sup>139</sup> [GOL0001113](#), [Exhibit 006](#) at pg. 13; [GOL0002981](#) at pg. 8, [Exhibit 006](#) at pg. 96.

to what was observed for other roads, so in his view, there was no immediate danger or areas of concern. He did not consider the road to be a potential harm.<sup>140</sup>

- d. Another Golder engineer, Ms. Rabiah Rizvi, did not recall anyone at Golder, at any point, expressing any safety concerns regarding the information in the Tradewind Report.<sup>141</sup>
- e. Mr. Gary Moore, Director of Engineering at the time, inquired with Dr. Uzarowski about the Tradewind Report in 2014. Mr. Moore testified that he had concerns about the relevance and applicability of the U.K. Guidelines and the investigatory level used by Tradewind, particularly because the friction values were higher than the 2007 MTO results.<sup>142</sup> The Draft Golder Report states that “Although the Friction Number (FN) values are higher than when measured in 2007 immediate after construction...”<sup>143</sup> Mr. Moore asked Dr. Uzarowski to clarify how the U.K. Guidelines and the recommendations made were applicable to the Red Hill in order to determine any next steps, if necessary.<sup>144</sup> Mr. Moore confirmed that in response, Dr. Uzarowski did not indicate that the friction test results posed any potential safety issues on the Red Hill.<sup>145</sup>
- f. Similarly, Dr. Uzarowski did not raise any red flags or safety issues in December 2015, when communicating with Mr. Moore, about the Tradewind Report or in March 2016 when discussing with Mr. Moore that the City would not be pursuing shotblasting, micro-surfacing or skidabrading. Contrary to Mr. Moore’s evidence, Dr. Uzarowski testified that December 2015 was the first time Mr. Moore asked for an explanation with respect to the U.K Guidelines and investigatory levels set out

---

<sup>140</sup> [Examination of Ludomir Uzarowski, dated June 21, 2022](#) [“Uzarowski Transcript, June 21”] at pg. 6033 – 6034, ll. 2 to 5.

<sup>141</sup> [Examination of Rabiah Rizvi, dated June 23, 2022](#) [“Rizvi Transcript, June 23”] at pg. 6486, ll. 12 to 18; pg. 6492, ll. 3 to 12, pg. 6501 – 6502, ll. 24 to 8, pg. 6515, ll. 19 to 15.

<sup>142</sup> [Examination of Gary Moore, dated July 18, 2022](#) [“Moore Transcript, July 18”] at pg. 8433 – 8437, ll. 7 to 4; OD 4, para 141 - [GOL0003513](#) attaching [GOL0003514](#) and [GOL0003515](#); and [HAM0000317\\_0001](#) attaching [HAM0000318\\_0001](#) and [HAM0000319\\_0001](#)

<sup>143</sup> [GOL0002981](#) at pg 7, [Exhibit 6](#).

<sup>144</sup> [Moore Transcript, July 18](#) at pg. 8461 - 8464 ll. 21 to 24.

<sup>145</sup> [Examination of Gary Moore, dated July 21, 2022](#) [“Moore Transcript, July 21”] at pg. 9063 – 9064, ll. 25 to 12, pg. 9085 - 9086, ll. 5 to 18.



in the Tradewind Report.<sup>146</sup> Regardless of the timing, Dr. Uzarowski did not indicate there were any safety issues during discussions with Mr. Moore in December 2015.<sup>147</sup> After investigating skidabrading and shotblasting in or around March 2016, Dr. Uzarowski engaged in further follow up discussions with Mr. Moore about the City not pursuing shotblasting, micro-surfacing or skidabrading. Again, Dr. Uzarowski did not raise any red flags.<sup>148</sup>

- g. When Mr. Moore requested friction testing in December 2017, Dr. Uzarowski did not express any safety concerns or see any red flags with the friction on the Red Hill. Dr. Uzarowski did not recommend any interim measures be put in place to address low friction, because of the planned resurfacing.<sup>149</sup>
- h. Ms. Rizvi testified that in November 2017 when Golder drafted a proposal for Mr. Moore, she was not aware of any discussions at Golder relating to safety or collisions on the Red Hill. No one at this time, including City or Golder staff, expressed concern regarding safety or friction levels on the Red Hill.<sup>150</sup>
- i. Ms. Rizvi testified that as of December 2017 when the Golder pavement evaluation occurred, she did not have any concerns related to the safety of the roadway. No one had expressed any concerns or discussed any collisions with her.<sup>151</sup>
- j. Another Golder engineer, Dr. Vimy Henderson, testified that until her departure from Golder in 2018, she did not at any time have concerns regarding the safety of the Red Hill based on friction levels and their impact on safety. She did not recall safety ever being a topic of conversation at Golder.<sup>152</sup>

---

<sup>146</sup> [Examination of Gary Moore, dated July 19, 2022](#) [“**Moore Transcript, July 19**”] at pg. 8616 – 8620, ll. 11 to 4; [Moore Transcript, July 21](#) at pg. 9063 – 9064, ll. 25 to 12; [Moore Transcript, July 21](#) at pg. 9085 - 9086, ll. 5 to 18.

<sup>147</sup> [Moore Transcript, July 21](#) at pg. 9085 - 9086, ll. 5 to 18.

<sup>148</sup> [Uzarowski Transcript, June 21](#) at pg. 6090, ll. [Moore Transcript, July 21](#) Page 9090, ll. 13 to 24

<sup>149</sup> [Uzarowski Transcript, June 21](#) – 6105-6107.

<sup>150</sup> [Rizvi Transcript, June 23](#) at pg. 6500 - 6502, ll. 4 to 8.

<sup>151</sup> [Rizvi Transcript, June 23](#) at pg. 6514 – 1615, ll. 6 to 9.

<sup>152</sup> [Examination of Vimy Henderson, dated June 22, 2022](#) [“**Henderson Transcript, June 22**”] at pg. 6330, ll. 13 to 24.

- k. On March 9, 2018, Dr. Uzarowski met with various City employees, including Mr. Marco Oddi and Mr. Michael Becke, with respect to his recommendation to shotblast or skidabrade at least the worst areas indicated in the Tradewind Report.<sup>153</sup> On cross-examination, Dr. Uzarowski was asked whether he advised the City that there may be a potential safety concern if the City did not take interim measures. He did not answer the question directly and instead testified that he is not a safety consultant.<sup>154</sup>
100. With respect to the March 9, 2018 meeting, the City’s evidence confirms that Dr. Uzarowski did not express any safety concerns in general or any concerns if interim measures are not taken by the City. In their evidence, Mr. Becke and Mr. Oddi confirmed that they did not recall Dr. Uzarowski raising any concerns with respect to any safety issue during this meeting on March 9, 2018.<sup>155</sup> Mr. Becke added that if safety concerns were raised, he would have noted them in his notes from the meeting.<sup>156</sup> His notes do not contain any such information.<sup>157</sup>
101. As shown above, Golder did not express any safety concerns or hazards that existed on the Red Hill. The City relied on Golder for such information and expected that as both a third-party consultant hired by the City and as Professional Engineers in Ontario (who have a duty to report issues that endanger the safety or welfare of public),<sup>158</sup> it was incumbent upon it to clearly communicate any safety concerns, had it believed that any existed.
102. The City’s reliance placed on Golder as an expert consultant, and the City’s expectation of clarity about safety concerns, clear explanations of technical reasons behind any recommendations, and any urgency associated with said recommendations, are all consistent with the evidence provided by Ms. Janice Baker. Ms. Baker was retained by

---

<sup>153</sup> [GOL0007414](#) at pg. 74, Exhibit 8 at pg. 76; [GOL0005970](#), Exhibit 8 at pg. 78.

<sup>154</sup> [Examination of Ludomir Uzarowski, dated June 23, 2022](#) at pg. 6366, ll. 3 to 17, pg. 6371, ll. 8 to 25.

<sup>155</sup> [Examination of Marco Oddi, dated August 10, 2022](#) [“**Oddi Transcript, August 10**”] at pg. 9310, ll. 17 to 24, pg. 9303 – 9307, ll. 21 to 12; [Examination of Mike Becke, dated June 28, 2022](#) [“**Becke Transcript, June 28**”] at pg. 7066- 7067, ll. 18 to “4.

<sup>156</sup> [Becke Transcript, June 28](#) at pg. 7066 – 7067, ll. 18 to 4.

<sup>157</sup> [HAM0061788\\_0001](#) at pg. 6, Exhibit 8 at pg. 76.

<sup>158</sup> [HAM0064292\\_0001](#) at pg. 10-11, Exhibit 89.

Commission Counsel to provide expert evidence on municipal corporate governance, including a consultant’s professional obligations when retained by the City.<sup>159</sup>

103. The totality of the evidence does not support that Golder had any belief that there was a safety concern on the Red Hill.

*e. No violation of driver expectation*

104. As noted above, Dr. Flintsch believes that the friction results on the Red Hill are “relatively low”. He further states that the alleged “relatively low” friction levels are exacerbated as the friction levels on adjacent highways are higher. He says this disparity results in an expectancy violation for the driver when driving on to the Red Hill. As discussed above, Mr. Hein disagrees that the friction results are low or relatively low.

105. In any event, Dr. Flintsch’s opinion that there is an expectancy violation from the different friction levels that lead to a safety issue is flawed. On cross-examination, Dr. Flintsch agreed that this alleged expectation of friction is regularly violated because of ordinary resurfacing of a highway.<sup>160</sup> Put another way, the ordinary driver encounters different friction levels while driving on a regular basis for various reasons and is therefore not being put in an unusual position as a driver on the Red Hill.

*v. Collision Trends Do Not Show a Friction Problem*

106. As part of reviewing collision trends on the Red Hill, Mr. Brownlee draws conclusions respecting i) wet road surface collisions before and after resurfacing in 2019; and ii) the proportion of single motor vehicle collisions compared to rear end collisions. In his analysis, Mr. Brownlee attempts to suggest the existence of a friction problem; however, his conclusions are not substantiated.

107. With respect to wet road collisions, Mr. Brownlee asserted in the Brownlee Report that the “proportion of collisions during wet road surface conditions appears to be significantly

---

<sup>159</sup> [Examination of Janice Baker, dated February 22, 2023](#) [“**Baker Transcript, February 22**”] at pg. 16000 – 16002, ll. 6 to 7.

<sup>160</sup> [Flintsch Transcript, February 16](#) at pg. 15, 649, ll. 11 to 22.

lower in Q4 of 2019 compared to previous years.”<sup>161</sup> Mr. Brownlee opined that the higher friction values post-resurfacing led to a decrease in wet road surface conditions. However, Mr. Brownlee withdrew this opinion after he had an opportunity to review the Karim Report.

108. The Karim Report thoroughly described the limitations of relying on a limited set of collision data before the pandemic (i.e. after resurfacing, there was only about six months of data before the pandemic) and the unreliability of collision data obtained during the peak of the pandemic from 2020 to 2022. After March 2020, the traffic volumes, driver speed, and collision data changed drastically due to the lockdown measures in place.<sup>162</sup> While Mr. Brownlee readily accepted these limitations during his testimony, he at first instance still chose to draw such conclusions in his report. Ultimately, as Mr. Karim correctly opined, “the conclusions that the 2019 Red Hill resurfacing had significantly altered the proportion of wet road related collisions are not supportable.”<sup>163</sup>
109. With respect to the proportion of single motor vehicle collisions on the Red Hill, Mr. Brownlee states in the Brownlee Report that: i) single motor vehicle (“SMV”) collisions are the most prominent impact type on the Red Hill, which is not typical for a freeway facility; and ii) in 2020, the prominent impact type changed to rear-end collisions on the Red Hill.
110. Mr. Brownlee provides no support for his conclusion that it is not typical for SMV collisions to be the most prominent impact type on a freeway facility. The evidence shows otherwise. Mr. Malone testified that a high proportion of SMV’s is expected on urban freeways.<sup>164</sup> Mr. Karim’s opinion is that on freeways, both SMV and rear-end collisions are common types of collisions due to the absence of traffic control devices and the lack of intersections.<sup>165</sup>

---

<sup>161</sup> [Brownlee Expert Report](#) at pg. 24.

<sup>162</sup> [Karim Expert Report](#) at pg. 27; [Karim Transcript, February 23](#) at pg. 16128, ll. 5 to 21.

<sup>163</sup> [Karim Expert Report](#) at pg. 27. It is worth noting that the proportion of wet road collisions was already declining between 2014-2018 and 2015-2019.

<sup>164</sup> [Malone Transcript, May 30](#) at pg. 3319 - 3321, ll. 22 to 19.

<sup>165</sup> [Karim Expert Report](#) at p. 20.

111. Mr. Brownlee again attempts to attribute the change in prominent impact type from SMV to rear-end collisions to an increase in friction following the resurfacing in 2019. He states that the “change in prominent collision types also takes place in the 2020 Annual Collision Report, the first full year after the Red Hill was resurfaced...”<sup>166</sup> and that poor road surface conditions is a primary contributory factor to an overrepresentation of SMV collisions on urban freeways.<sup>167</sup> In fact, the prominent impact type changes to rear-end collisions (54.5%) from SMV collisions (21.5%) in the 2019 Annual Collision Report. This undermines the alleged connection between increased friction and a corresponding reduction in SMV collisions.
112. Furthermore, Mr. Karim undertook an analysis of the SMV and rear-end collisions that occurred from 2008 to 2020 on the Red Hill. Mr. Karim concluded that when “non-reportable collisions”<sup>168</sup> are included, the averages for rear-ends was 42% and SMV collisions was 33%. This is because rear-end collisions are typically low cost to repair, which would categorize them as non-reportable.<sup>169</sup> When all collisions are considered, the rear-end collisions become the prominent impact type on average. In some years (e.g. 2013 and 2016), the SMV collisions were higher than rear-end collisions.<sup>170</sup> This supports the view that both SMV and rear-end collisions are common types on the Red Hill.

**E. Stone Mastic Asphalt Mix Design Was Acceptable**

113. Pavement can be affected by the mix design used for a roadway. The Red Hill was built with a perpetual pavement design with a flexible rich bottom mix. The surface course of the asphalt was SMA. This Inquiry explored in depth the characteristics and use of SMA in Ontario.
114. Dr. Flintsch has confirmed that the SMA mix design used on the Red Hill was consistent with current mix design practices for SMA.<sup>171</sup> While there may have been some deviation

---

<sup>166</sup> [Brownlee Expert Report](#) at pg. 25-26.

<sup>167</sup> [Brownlee Expert Report](#) at pg. 25.

<sup>168</sup> “Non-reportable collisions” are collisions that did not meet the threshold of mandatory police reporting. See [Karim Expert Report](#) at pg. 29.

<sup>169</sup> HAM00064784, Exhibit 237.

<sup>170</sup> HAM00064784, Exhibit 237.

<sup>171</sup> [Flintsch Expert Report](#) at pg. 26.

from the intended mix design values, none of them would have any material impact on the frictional properties of the pavement surface.<sup>172</sup> He also did not identify any issues during placement of the SMA that would have resulted in lower frictional values.<sup>173</sup>

115. Macrottexture enables water drainage paths on the pavement which reduces the potential for hydroplaning and in turn creates better adhesion with the pavement.<sup>174</sup> As Dr. Flintsch states, roadways with high speeds need a pavement with higher macrottexture to reduce the rate that friction decreases as speed increases on wet pavement.<sup>175</sup>
116. Dr. Flintsch concluded that the macrottexture values are appropriate on the Red Hill.<sup>176</sup>

**F. High Quality Aggregate Used in Asphalt Mix Design**

117. Aggregate type also influences an important aspect of pavement friction known as microtexture. Microtexture is the texture on the surface of a coarse aggregate which interacts with the tire and provides friction on both wet and dry roads.<sup>177</sup> Various witnesses testified in this Inquiry on the selection and quality of the aggregate used, which was an aggregate from the Demix-Varenes Quarry in Quebec (the “**Demix Aggregate**”).
118. In particular, Dr. Baaj provided a thorough review of the testing and technical data available on the Demix Aggregate and concluded that the relevant requirements were met in 2007.<sup>178</sup> He further concluded that the Demix Aggregate is fully adequate for use in surface courses of high volume, high-speed highways in Ontario.<sup>179</sup> These conclusions are undisputed.

**G. Decreasing Friction Demand is Reasonable to Address Wet Road Collisions**

119. This Inquiry has heard evidence with respect to friction demand in addition to the concept of the investigatory level as discussed above. There is no dispute between Dr. Flintsch and

---

<sup>172</sup> [Flintsch Expert Report](#) at pg. 26.

<sup>173</sup> [Flintsch Expert Report](#) at pg. 26.

<sup>174</sup> [Flintsch Primer Expert Report](#) at pg. 23 – 24.

<sup>175</sup> [Flintsch Primer Expert Report](#) at pg. 8 – 9.

<sup>176</sup> [Flintsch Primer Expert Report](#) at pg. 25. In fact, Dr. Flintsch observed that the May 2019 measurements by ARA showed higher macrottexture values than those taken in 2017 by Golder. See [Flintsch Expert Report](#) at pg. 25.

<sup>177</sup> [Flintsch Primer Expert Report](#) at pg. 6 – 7.

<sup>178</sup> [Flintsch Transcript, February 16](#) at pg. 15542 - 15543, ll. 12 to 5.

<sup>179</sup> [Baaj Expert Report](#) at pg. 27.

Mr. Hein that friction demand depends on various factors such as curvature, ramps, vehicles and human factors and the interaction between these factors.<sup>180</sup>

120. Friction demand is particularly relevant in the context of the 2015 CIMA Report, about which both friction experts were examined. The 2015 CIMA Report concluded that a combination of speed and wet surface conditions may be the primary contributing factors to the wet weather collisions on the Red Hill.
121. As discussed above, both experts agree that without further analysis, a reliable conclusion cannot be drawn with respect to which one of two factors—speeding or wet surface conditions—would be the primary contributor to the wet weather collisions. In either case, the experts agree that where the supply of friction is not meeting the friction demand, one solution is to reduce the friction demand (as opposed to supplying additional friction).<sup>181</sup> Reducing friction demand is a reasonable solution to reduce the number of collisions or the severity of collisions that occur.<sup>182</sup>
122. One well-accepted way of reducing friction demand is to deploy countermeasures or take actions to reduce speeding, which was a known concern on the Red Hill (see discussion above respecting the measured speeds by CIMA). As Mr. Hein testified, reducing friction demand is “not physically doing something to change the pavement surface but it’s reducing the need to have higher friction ... because the speed limits are going down.”<sup>183</sup>
123. Mr. Hein acknowledges that supplying additional pavement friction is an option, such as by replacing the pavement surface; however, it is important to emphasize that increasing friction levels does not necessarily reduce the occurrence of collisions.<sup>184</sup> In fact, friction may have no influence on the collision occurrence on the roadway.<sup>185</sup> Importantly, countermeasures such as reducing the speed limit, adding signage and improving speed enforcement, are going to have a “substantially higher impact on [collisions] than

---

<sup>180</sup> [Flintsch Transcript, February 16](#) at pg. 15594 - 15595, ll. 12 to 6.

<sup>181</sup> [Hein Transcript, February 24](#) at pg. 16305, ll. 5 to 18; [Flintsch Transcript, February 16](#) at pg. 15691 – 15692, ll. 22 to 3.

<sup>182</sup> [Flintsch Transcript, February 16](#) at pg. 15693, ll. 10 to 20.

<sup>183</sup> [Hein Transcript, February 24](#) at pg. 16304, ll. 7 to 18.

<sup>184</sup> [Hein Transcript, February 24](#) at pg. 16305, ll. 5 to 18.

<sup>185</sup> [Hein Transcript, February 24](#) at pg. 16304 – 16305, ll. 19 to 6.

incrementally increasing the friction on the pavement surface.”<sup>186</sup> Removing and replacing a surface, or other measures that increase friction, is not always necessary to address any alleged friction issue, especially in light of the potential costs and effectiveness as described in the following section.

124. Accordingly, there is significant support for focussing first on reducing friction demand as opposed to increasing friction supply in addressing wet road collisions.

#### **H. Proposed Remedial Measures by Golder Were Not Necessary**

125. The Inquiry received expert evidence regarding the remedial measures proposed by Golder to micro-surface a significant portion of the Red Hill in 2014 and to shotblast areas of concern in March 2018. As detailed below, Dr. Flintsch and Mr. Hein both agreed that such measures were not necessary given the planned resurfacing in 2019.
126. Mr. Hein testified that, in deciding whether to implement a particular remedy, a cost-benefit analysis is undertaken which involves, for example, consideration of return on investment, necessity of the remedy and budget.<sup>187</sup>
127. Applying the cost-benefit analysis, Mr. Hein opined that micro-surfacing was not necessary in 2014 (or any other time) because, as discussed above, the friction values were “reasonably good” on the Red Hill.<sup>188</sup> Micro-surfacing would therefore be a significant expense, perhaps in the order of \$1,000,000 with disruption to users, for little return on value.<sup>189</sup> As Mr. Hein has pointed out, Golder’s recommendation of micro-surfacing was to address cracking and that friction was of secondary importance.<sup>190</sup>
128. While Dr. Flintsch opines that micro-surfacing – if done properly – could address a friction problem, he does not provide an opinion as to when micro-surfacing should have been implemented on the Red Hill.<sup>191</sup> This suggests a lack of urgency in his view to micro-

---

<sup>186</sup> [Hein Transcript, February 24](#) at pg. 16316, ll. 7 to 21.

<sup>187</sup> [Hein Transcript, February 24](#) at pg. 16326-16327, ll. 6 to 2; [Flintsch Transcript, February 16](#) at pg. 15666, ll. 12 to 17.

<sup>188</sup> [Hein Transcript, February 24](#) at pg. 16323, ll. 16 to 25.

<sup>189</sup> [Hein Expert Report](#) at pg. 10.

<sup>190</sup> [Hein Transcript, February 24](#) at pg. 16323, ll. 16 to 25.

<sup>191</sup> [Flintsch Transcript, February 16](#) at pg. 15618 – 15619, ll. 5 to 3.



surface the Red Hill. He also does not undertake a fulsome cost/benefit analysis. It is also important to keep in mind that Dr. Flintsch agrees that inadequate friction supply can be managed by reducing friction demand through countermeasures, which would act as a reasonable and cost-effective alternative.<sup>192</sup>

129. With respect to the shotblasting recommendation, Dr. Flintsch and Mr. Hein agree that shotblasting is a short-term solution which lasts for mere months and at the material time, the better and longer-term solution was to resurface, which would produce a new surface and provide improved friction for a longer period.<sup>193</sup> Shotblasting would in those circumstances be an overly expensive and temporary remedy.<sup>194</sup> On the latter point, Mr. Hein testified that while shotblasting is intended to improve friction, his experience is that shotblasting may be overly aggressive and cause physical damage to the roadway.<sup>195</sup>

## **PART TWO - THE CITY TOOK STEPS TO MAINTAIN AND IMPROVE THE RED HILL**

130. The City's Public Works department provides essential services to the residents and visitors in Hamilton, including roads operation and maintenance, infrastructure rehabilitation, parks and open spaces, transit, waste management, forestry and horticulture, corporate facility management, transit, roadway safety, and more. In delivering its mandate, Public Works must allocate its resources effectively amongst competing priorities and in accordance with the City's mission statement and values.
131. The Inquiry received extensive evidence regarding the work of the Traffic Operations and Maintenance division, including the various processes and initiatives developed to monitor and improve the safety of the City's Road network, which includes nearly 7,000 lane-kilometers of urban and rural roads, including two urban parkways, in a cost-effective manner.<sup>196</sup>

---

<sup>192</sup> [Flintsch Transcript, February 16](#) at pg. 15691 – 15692, ll. 22 to 2.

<sup>193</sup> [Flintsch Transcript, February 16](#) at pg. 15686 – 15687, ll. 6 to 9; [Hein Expert Report](#) at pg. 11.

<sup>194</sup> [Hein Expert Report](#) at pg. 11; [Hein Transcript, February 24](#) at pg. 16331 – 32, ll. 14 to 10.

<sup>195</sup> [Hein Transcript, February 24](#) at pg. 16332 – 16333, ll. 5 to 2.

<sup>196</sup> [RHV0000597](#), Exhibit 209 at pg. 3.

132. With respect to the Red Hill, the evidence indicated that the Transportation Operations and Maintenance division<sup>197</sup> was responsible for the safety and maintenance of the Red Hill, which included evaluating the existing traffic conditions. The Asset Management section in the Engineering Services division was responsible for the infrastructural durability of the roadway.<sup>198</sup>
133. The Transportation Operations and Maintenance division spent considerable time and resources monitoring, maintaining and improving the Red Hill, including through the following programs and initiatives: the Hamilton Strategic Road Safety program, the Network Screening program, the Collision Countermeasure program, the publication of Traffic Safety Status and Annual Collision Reports, third-party safety reviews and studies of the Red Hill.
134. The evidence regarding the work of these divisions to maintain and improve the Red Hill is summarized below.

**A. Hamilton Strategic Road Safety Program**

135. The Hamilton Strategic Road Safety Committee (the “**Hamilton Road Safety Committee**”) was established in 2007 and re-convened on March 2015.
136. The objective of the Hamilton Road Safety Committee is to reduce collisions and improve safety for all roadway users in Hamilton through the Hamilton Strategic Road Safety Program, which includes the publication of Annual Collision Reports (described below), education, and enforcement.<sup>199</sup>
137. The Committee is composed of representatives from a number of stakeholder groups, including the Hamilton Police Services, Public Health Services and well as from the City’s Traffic Operations & Engineering and Communications group.<sup>200</sup> This multi-disciplinary

---

<sup>197</sup> A helpful summary of the evolution of the restructuring of this division is provided at [Exhibit 002](#) at pg. 2 to 19.

<sup>198</sup> [Ferguson Transcript, August 11](#) at pg. 9596, ll.4 to 11; [Examination of Martin White, dated June 9, 2022](#) [“**White Transcript, June 9**”] at pg. 4783, ll. 1 to 6; [Examination of Gord McGuire, dated October 24, 2022](#) [“**McGuire Transcript, October 24**”] at pg. 14171 – 14172, ll. 25 to 4; [Examination of Jason Worrton, dated June 10, 2022](#) [“**Worrton Transcript, June 10**”] at pg. 4962, ll. 14 to 19.

<sup>199</sup> [HAM0044774](#) at pg. 3, Exhibit 005.

<sup>200</sup> [HAM0044774](#) at pg. 3, Exhibit 005.

committee promoted greater cooperation and coordination between the City's traffic safety initiatives and the work of the Hamilton Police in enforcing speed limits and minimizing aggressive driving on the Red Hill. For example, in 2016, the Hamilton Road Safety Committee worked with the Hamilton Police Services to establish an aggressive driver enforcement campaign on the Red Hill.<sup>201</sup>

**B. Traffic Safety Status and Annual Collision Reports**

138. The City's Traffic Engineering Section published reports summarizing the traffic collision statistics, and general factors associated with collisions and driver and pedestrian behaviour to provide Council and the public with information regarding the collision patterns and overall safety of the City's roadway transportation system.<sup>202</sup> The safety reports were initially published as Traffic Safety Status Reports and after 2010 as Annual Collision Reports. A summary of the information provided in these reports is included below.
139. The Traffic Safety Status Reports provide a summary of the statistics associated with traffic collisions that occur in the City and are produced in two volumes.<sup>203</sup> Volume 1 was published annually or bi-annually and contained the summary of collision data for the entire City road network for which data was available, including the Red Hill, specific to each year.<sup>204</sup> Volume 1 Traffic Safety Status Reports included a breakdown of overall frequency and trends, plus location-specific data, in the form of Network Screening (discussed further below). Volume 2 was published every three years and contained general information on road users and roadway conditions.<sup>205</sup>
140. The Annual Collision Reports are published annually and provide a review of collisions statistics occurring on City roadways over a five-year span and include a specific section on the Red Hill and LINC, which provides a breakdown of the collisions on the parkways.<sup>206</sup>

---

<sup>201</sup> [HAM0044774](#) at pg. 3, Exhibit 005.

<sup>202</sup> [HAM0013587](#) at pg. 2, Exhibit 010a.

<sup>203</sup> [HAM0003847](#) at pg. 2, Exhibit 005.

<sup>204</sup> [HAM0003847](#) at pg. 2, Exhibit 005.

<sup>205</sup> [HAM0003847](#) at pg. 2, Exhibit 005.

<sup>206</sup> See for example the 2017 Annual Collision Report, [HAM0013587](#) at pg. 2, Exhibit 010a.

141. Since the opening of the Red Hill in 2007, the City has published a summary of collision data for the entire City road network, including the Red Hill up until 2010 and a breakdown of the Red Hill specific collision data for the 2013 to 2019 period.<sup>207</sup> Publishing these reports fosters transparency in the work of the Traffic Engineering Section to monitor and improve the safety of the City's roadway transportation system, including the Red Hill.<sup>208</sup>

**C. Network Screening and Collision Countermeasures Programs**

142. The City's Network Screening program applies a risk analysis methodology to carry out a comprehensive review of the City's entire road network to identify the locations at which collisions are overrepresented and that could most benefit from improvement in order to best allocate the use of City resources.<sup>209</sup> A comprehensive description of the initial parameters of the Network Screening program can be found in the City's 2007 Traffic Safety Report.<sup>210</sup>

143. During his testimony, Mr. Stephen Cooper described the use of the City's Network Screening program and the related Collision Countermeasures program in the 2010 period during which he was a Superintendent in the Traffic Operations section of Traffic Engineering & Operations. Mr. Cooper provided the following information:

- a. The Network Screening program created a ranking of collision locations throughout the City broken down by segments to allow for an apples-to-apples comparison of the roadways and to allow staff to prioritize specific areas or issues.
- b. Staff from the Traffic Engineering & Operations group met monthly to discuss the rankings and assign staff to investigate specific roadway(s).
- c. Staff held bi-monthly meetings during which a specific staff member would present on their assigned roadway(s). The presentation included a summary of the potential

---

<sup>207</sup> [HAM0013587](#), [RHV0000609](#), [RHV0000908](#), Exhibit 010a ; [RHV0000597](#), Exhibit 209.

<sup>208</sup> [Ferguson Transcript, August 11](#) at pg. 9507, ll. 11 to 23.

<sup>209</sup> See [HAM0039010\\_0001](#) at pg. 23, Exhibit 005.

<sup>210</sup> See [HAM0039010\\_0001](#) at pg. 23, Exhibit 005.

issue and identified potential countermeasures, which were discussed by the group and a group decision was made on the best way forward.<sup>211</sup>

144. The evidence confirmed that the Collision Countermeasures program functioned as intended to assess the Red Hill for any segments that required attention and implement countermeasures to reduce collisions:
- a. The 2010 Traffic Safety Status report, which contained the Network Screening Results, identified one of the Red Hill ramps as a location where there may be an overrepresentation (the “**Mud St. Off Ramp**” or “**Ramp 6**”).<sup>212</sup>
  - b. In or around March 31, 2010, staff in the Traffic Operations section received a presentation on the Red Hill Mud southbound – eastbound off ramp.<sup>213</sup> The PowerPoint presentation stated that the ramp was ranked number 64 of the top 100 road segments in the City that may have an overrepresentation of collisions and identified excessive speeding and lost control as the primary collision patterns as well as potential countermeasures.<sup>214</sup>
  - c. Mr. Cooper could not recall the specific countermeasures that were implemented following this presentation, but he was clear in his evidence that some countermeasures were implemented on this ramp between 2010 and 2013. Specifically, Mr. Cooper stated that he had a “pretty good idea” that the countermeasures included left hand signs, curb warning signs, increasing the size of the speed advisory signs that were present and diamond grade sheeting.<sup>215</sup> Mr. Cooper’s evidence is consistent with the documentary evidence, detailed below.

---

<sup>211</sup> [Examination of Stephen Cooper, dated June 13, 2022](#) [“**Cooper Transcript, June 13**”] at pg. 4997 - 5007, ll. 15 to 5.

<sup>212</sup> [HAM0040777\\_0001](#) at pg. 27; Exhibit 005.

<sup>213</sup> [Cooper Transcript, June 13](#) at pg. 5001 - 5003, ll. 1 to 8 referencing HAM0062336.

<sup>214</sup> [Cooper Transcript, June 13](#) at pg. 5003 - 5004, ll. 14 to 13 referencing HAM0062336 at pg. 3.

<sup>215</sup> [Cooper Transcript, June 13](#) at pg. 5216, ll. 11 to 20.

145. In February 2013, Mr. Cooper exchanged emails with Brian Applebee of CIMA, as they discussed engaging CIMA to do a safety review of a portion of the Red Hill (the “**2013 CIMA Safety Review**”).
146. On February 28, 2013, Mr. Applebee inquired about the impetus of the 2013 CIMA Safety Review and asked whether there were any existing concerns regarding collisions. In his response, Mr. Cooper confirmed that there was no indication that the Red Hill mainline had an overrepresentation of collisions.<sup>216</sup> He further advised that City staff had taken steps to address the collision patterns on the Mud St. off ramp through improved signage and that it was too early to assess the efficacy of the countermeasures:

This is due to a motion put forward by a Councillor for an investigation. To include lighting upgrades on the Red Hill in the area of Mud/Stone Church interchange, investigate better reflective signage and lane markings or “other” initiatives to assist motorists and that full costing of all options and alternatives be presented.

**We are not aware of a significant collision issue on the mainline, but the ramp leading from Mud/Stone Church to Red Hill WB/SB has many run off type, which we have attempted address using signing improvements, it is too early to tell if they’ve made an improvement.**<sup>217</sup>

147. CIMA confirmed that the City had recently improved signage on Ramp 6 in its report flowing from the 2013 CIMA Safety Review (the “**2013 CIMA Report**”) and noted that given the timing of the improvements, the effect of the improved signage on collisions could not be quantified at the time of the review.<sup>218</sup>
148. The Network Screening program continues to be in use by the Public Works department to monitor and improve the City’s roadway network, after a hiatus following the departure of the program director, Mr. Hart Solomon, in 2012.
149. During his testimony, Mr. Soldo (then the Chief Roads Official) described the continued use of the Network Screening program in 2018 to identify road segments that are overrepresented in terms of collisions throughout the City to prioritize the implementation

---

<sup>216</sup> [CIM0009208](#) at pg. 2, Exhibit 006.

<sup>217</sup> [CIM0009208](#) at pg. 2, Exhibit 006.

<sup>218</sup> [HAM0041871](#) at pg. 45, Exhibit 006.

of countermeasures.<sup>219</sup> Mr. Soldo noted that the Network Screening list for 2013 to 2017 in the 2017 Annual Collision Report did not include any Red Hill mainline segments.<sup>220</sup>

**D. Safety Reviews and Studies by CIMA – The Safety Experts**

150. As part of the City’s ongoing efforts to monitor, maintain and improve the Red Hill, the City appropriately sought out consultation from independent, third-party experts to conduct studies and comprehensive safety assessments of the Red Hill.

151. The Inquiry received considerable evidence regarding City staff’s expectations of its consultants, and particularly its safety consultant CIMA, as well as the manner and clarity with which CIMA’s recommendations were conveyed in its reports. This evidence is essential in discerning City staff’s understanding of the safety performance of the Red Hill and the steps they took to implement the recommendations provided by CIMA.

152. As detailed below, the City witnesses who worked with CIMA were clear in their evidence that they relied on their consultant to identify: (1) any actual or potential safety issues and immediate countermeasures or investigations that may be necessary to address safety; (2) investigations or countermeasures that should and could be implemented; and (3) a timeline to implement the countermeasures or conduct any investigations.

153. The evidence further indicates that staff implemented CIMA’s recommendations in a manner that was consistent with the urgency, timelines and prioritization of the countermeasures and investigations prescribed by CIMA. The evidence on these points is summarized below.

***i. The City Engaged a Third-Party Expert to Conduct Safety Assessments on the Red Hill***

154. The City engaged CIMA, an independent consultant with significant expertise and experience in roadway safety, to perform safety reviews of the Red Hill in 2013 and 2015. As part of the safety review, CIMA understood that it was to identify any potential or actual

---

<sup>219</sup> [Examination of Edward Soldo dated September 12, 2022](#) [“Soldo Transcript, September 12”] at pg. 10295 – 10296, ll. 20 to 23.

<sup>220</sup> [HAM0001402](#) at image 58, Exhibit 009; [Soldo Transcript, September 12](#) at pg. 10295 – 10296, ll. 25 to 9.

safety issues on the Red Hill and investigate possible solutions to improve the safety performance of the roadway.<sup>221</sup>

155. In describing City staff’s reliance on consultants to conduct a safety review of the Red Hill, Martin White, the Manager of Traffic Operations and Engineering from 2013 to 2019, stated that while City staff had expertise in local and arterial roadways, they did not have expertise in maintaining highways and relied on CIMA to conduct a more comprehensive safety assessment than the typical review conducted by City staff:

Q. Why did you want to keep the review of the LINC and the remaining portions of the Red Hill Valley Parkway separate?

A. Because there's a bigger scope of work than the traffic safety report in its entirety, and it also followed the [2013 CIMA] report we had just done and included - you know, one of the things I'll say is that traffic staff were experts in local residential roadways, arterial roadways, but operating on essentially a parkway halfway between an arterial roadway and a freeway or a highway, we didn't have a lot of experience with. And I think it was prudent to hire a consultant who could assess those things from a much higher perspective and had more knowledge and expertise in that.<sup>222</sup>

156. Geoff Lupton, the Director of Energy, Fleet & Traffic, Public Works at the time, similarly confirmed that CIMA was engaged to conduct safety reviews of the Red Hill because “it’s good to have an outside party give an unbiased review of what they think it should be and retaining somebody with the appropriate expertise to do that work.”<sup>223</sup>

*ii. The City Relied on CIMA’s Expertise to Identify Safety Issues*

157. The Inquiry received extensive evidence from City witnesses who were involved in the 2013 CIMA Safety Review and/or CIMA’s safety review of the Red Hill in 2015 (the “**2015 CIMA Safety Review**”), including from Stephen Cooper, David Ferguson, Martin White, Jason Worrton and Mr. Lupton. These witnesses gave clear evidence of their reliance on CIMA to identify any significant or urgent safety issues or to identify the need for any

---

<sup>221</sup> [HAM0000426](#) at pg. 1, Exhibit 006.

<sup>222</sup> [Examination of Martin White, dated June 8, 2022](#) [“**White Transcript, June 8**”] at pg. 4530, ll. 9 to 24.

<sup>223</sup> [Examination of Geoff Lupton, dated June 8, 2022](#) [“**Lupton Transcript, June 8**”] at pg. 4410, ll. 2 to 18.



significant or urgent investigations that CIMA deemed necessary to ensure the safe operation of the Red Hill.<sup>224</sup>

158. Consistent with these expectations, CIMA understood that it was responsible for identifying any actual or potential safety issues. Mr. Applebee and Mr. Malone further confirmed that it was CIMA’s practice to immediately advise the client of any significant or urgent issue.<sup>225</sup>

159. The evidence indicates that CIMA did not identify any immediate or significant safety issues or any significant or urgent investigations necessary to ensure the safe operation of the Red Hill, while conducting the 2013 and 2015 CIMA Reviews or at any point during CIMA’s work on the Red Hill.

*iii. The City Relied on CIMA to Identify the Necessary and Optional Countermeasures*

160. The Inquiry received evidence from Ms. Baker, CIMA, and City witnesses on the importance of distinguishing between recommendations that should be done and recommendations that may be helpful but are discretionary and ultimately not required in consultant reports.

161. Mr. Malone and Mr. Applebee confirmed that, in the 2013 and 2015 CIMA Reports, CIMA identified recommendations as ones the City “should consider” to indicate that the action should be undertaken to improve the safety performance of the roadway unless there is a reason not to. On the other hand, CIMA used “could consider” to indicate that the action could be done, but is not required to improve the safety performance of the roadway.<sup>226</sup> This is because “should consider” has a very specific meaning in traffic and transportation engineering.<sup>227</sup>

---

<sup>224</sup> [Cooper Transcript, June 13](#) at pg. 5212, ll. 12 to 19; [Lupton Transcript, June 8](#) at pg. 4422, ll. 17 to 23; [White Transcript, June 9](#) at pg. 4794, ll. 6 to 10; [Worron Transcript, June 10](#) at pg. 4968, ll. 8 to 25; [Ferguson Transcript, August 11](#), pg. 9601 – 9602, ll. 22 to 14; [Examination of Brian Applebee, dated June 2, 2022](#) [[“Applebee Transcript, June 2”](#)] at pg. 3891, ll. 1 to 9.

<sup>225</sup> [Malone Transcript, June 1](#) at pg. 3785 – 3787, ll. 23 to 2; [Applebee Transcript, June 2](#) at pg. 3877 – 3878, ll. 19 to 10.

<sup>226</sup> [Malone Transcript, June 1](#) at pg. 3728, ll. 4 to 12.

<sup>227</sup> [Malone Transcript, May 31](#) at pg. 3550 – 3551, ll. 18 to 10; [Applebee Transcript, June 2](#) at pg. 3893 – 3895, ll. 11 to 17.

162. Ms. Baker underscored the importance of distinguishing between these two categories of recommendations to ensure the “municipality’s time, effort, and resources are assigned to the right priorities” such that any required countermeasures should be completed first and any optional countermeasures may be completed on a discretionary basis.<sup>228</sup> Ms. Baker expanded on this issue in her testimony noting that part of the overall value of a consultant’s report is to distinguish between countermeasures that must be implemented as opposed to ones that are discretionary.<sup>229</sup>

163. Mr. Cooper, Mr. Ferguson, Mr. White, Mr. Worrton and Mr. Lupton confirmed that they had a similar understanding of CIMA’s use of “could consider” and “should consider”. In their testimony, these witnesses stated that they understood CIMA to use “should consider” to mean that the recommendation must be seriously considered whereas “could consider” is used for recommendations that are optional and may result in some improvement but are not required to improve the safety performance of the roadway.<sup>230</sup> This is consistent with the best practices outlined by Ms. Baker in her report.

*iv. The City Relied on CIMA to Prioritize Recommendations and Provide Appropriate Timelines*

164. In addition to distinguishing between the required and optional recommendations, the witnesses also agreed that consultants are expected to provide a prioritized list of potential countermeasures based on ease of implementation, cost, and the efficacy of the countermeasures in improving the overall safety performance of the Red Hill to allow for a staged approach to implementation.<sup>231</sup>

165. The prioritization of countermeasures allows for a staged approach whereby the City can pursue the easy to implement countermeasures first – described by Mr. Ferguson and Ms.

---

<sup>228</sup> [Report of Janice Baker, dated November 17, 2022](#) [“**Baker Expert Report**”] EXP0000193, Exhibit 230 at pg. 10.

<sup>229</sup> [Baker Transcript, February 22](#) at pg. 16001 – 16002, ll. 16 to 7.

<sup>230</sup> [Lupton Transcript, June 8](#) at pg. 4421, ll. 5 to 14, pg. 4422, ll. 5 to 16; [Examination of Geoff Lupton, dated June 7, 2022](#) [“**Lupton Transcript, June 7**”] at pg. 4279 – 4280, ll. 22 to 6; [White Transcript, June 9](#) at pg. 4793, ll. 10 to 21; [Worrton Transcript, June 10](#) at pg. 4968, ll. 17 to 25; [Examination of David Ferguson, dated June 6, 2022](#) [“**Ferguson Transcript, June 6**”] at pg. 4000 – 4002, ll. 2 to 9.

<sup>231</sup> [Cooper Transcript, June 13](#) at pg. 5073 – 5075, ll. 20 to 13; [Ferguson Transcript, June 6](#) at pg. 3959 – 3960, ll. 21 to 17; [HAM0000702](#) at pg. 50, Exhibit 007.

Baker as the “low hanging fruit”<sup>232</sup> – and evaluate their effect for a reasonable amount of time and then consider additional, more costly options, if required.<sup>233</sup> With respect to what constitutes a reasonable amount of time, the Inquiry received evidence that it would take at least three to five years after a countermeasure is implemented to properly evaluate its effect on collisions.<sup>234</sup>

166. The evidence above regarding the manner in which CIMA characterized the urgency and timing of its recommendations is critical to understanding and assessing the steps taken by the City in response to the recommendations in the 2013 CIMA Safety Report and in CIMA’s report following the 2015 CIMA Review (the “**2015 CIMA Safety Report**”), detailed below.

v. **The 2013 CIMA Report**

167. As part of the 2013 CIMA Safety Review, CIMA reviewed the operational and safety aspects of the Red Hill between Dartnall Road and Greenhill Avenue, including the Mud Street/Stone Church Road intersection (the “**Study Area**”) to establish the existing safety performance of the Study Area, identify any potential or actual safety issues, and investigate possible solutions to improve the safety performance of the Study Area.<sup>235</sup>
168. CIMA did not identify any urgent or significant safety issues in the Study Area and concluded that overall, the Red Hill was operating safely. CIMA identified countermeasures that would improve the safety performance of the overall Study Area as well as particular segments of the mainline and ramps that could benefit from improvement.
169. A summary of the evidence with respect to CIMA’s key findings and recommendations as well as the City’s response to the 2013 CIMA Report is provided below.

---

<sup>232</sup> [Ferguson Transcript, June 6](#) at pg. 4110, ll. 3 to 9; [Baker Transcript, February 22](#) at pg. 15963, ll. 1 to 9.

<sup>233</sup> [Ferguson Transcript, June 6](#) at pg. 3997 – 3998, ll. 16 to 8.

<sup>234</sup> [Karim Expert Report](#) at pg. 24.

<sup>235</sup> [HAM0041871](#) at pg. i, Exhibit 006; [HAM0000426](#) at pg. 1, Exhibit 006.

*a. CIMA's collision analysis*

170. CIMA undertook two types of analyses to assess the number of collisions in the Study Area: (1) using an analytical tool known as the Enhanced Interchange Safety Analysis Tool (“ISATe”) to assess the expected number of collisions; and (2) comparing the number of collisions and different collision types on the Red Hill to municipal and provincial averages.
171. Based on their collision analysis, CIMA concluded that some segments of the Red Hill had a higher number of total collisions when compared to similar type facilities and that the Study Area had an atypical proportion of SMV, wet weather, and non-daylight collisions when compared to the averages in Hamilton and in the Province of Ontario.<sup>236</sup> However, during his examination, Mr. Malone agreed that there were significant limitations to the collision analysis which would undermine these conclusions.<sup>237</sup>
172. The ISATe tool can indicate that a location has a better safety performance than other locations of the same facility type when the tool is calibrated for the collision experience in that jurisdiction. Calibration is important because it ensures that the evaluation results are meaningful and accurate for a specific jurisdiction.<sup>238</sup>
173. During Commission Counsel’s examination of Mr. Malone, it was suggested that the ISATe tool could be used to assess whether the Study Area was performing better than would be expected for a similar type facility.<sup>239</sup> However, on cross-examination, Mr. Malone agreed that, in this case, the ISATe could not be used to compare the safety performance of the Study Area to other facilities because it was not calibrated for Hamilton. It could only be used to rank the locations of the Study Area in comparison to other locations also within the Study Area.<sup>240</sup> Mr. Malone further agreed that there are limitations to comparing segments of the Study Area against each other when assessing collisions

---

<sup>236</sup> [HAM0041871](#) at pg. 34, Exhibit 006.

<sup>237</sup> [Malone Transcript, June 1](#) at pg. 3704 – 3705, ll. 17 to 5 and [Malone Transcript, June 1](#) at pg. 3714, ll. 13 to 20.

<sup>238</sup> [HAM0041871](#) at pg. 15 – 16, Exhibit 006.

<sup>239</sup> [Malone Transcript, May 30](#) at pg. 3357, ll. 14 to 25, pg. 3358, ll. 4 to 13.

<sup>240</sup> [Malone Transcript, June 1](#) at pg. 3703, ll. 2 to 15.

because different types of segments have different characteristics and, therefore, a different expectation of collisions.<sup>241</sup>

174. The second type of collision analysis CIMA used was to compare the number and type of collisions in the Study Area with the averages for all roads in Hamilton and in the Province of Ontario. In his examination, Mr. Malone agreed that there were limitations and “deficiencies”<sup>242</sup> in this analysis because it compared the Study Area to roadways with different characteristics that have different expected outcome of collisions.<sup>243</sup> For example, curvier roads are expected to have a higher proportion of wet weather collisions than straight roads.<sup>244</sup>
175. CIMA made similar comments in two collision memoranda prepared for the City in 2018 and 2019 stating that “it is not advised” to compare the Provincial collision information against the Red Hill.<sup>245</sup> This was further confirmed by Pedram Izadpanah, Senior Project Manager and Partner at CIMA, in his examination where he stated that a comparison between the Red Hill and provincial averages cannot be relied upon.<sup>246</sup>
176. These limitations are significant in light of CIMA’s conclusion that there was a “high” proportion of wet surface collisions on the Study Area solely on the basis that the Study Area had a higher proportion of wet weather collisions compared to the Hamilton and Provincial averages at 13% and 17.4%, respectively. In fact, Mr. Malone cautioned against this type of “apples to oranges” comparison when asked to compare the proportion of wet weather collisions in the Study Area to “Similar Locations (400 series)” as noted in CIMA’s PowerPoint Presentation delivered to the City on June 6, 2013.<sup>247</sup>
177. Commission Counsel noted that the proportion of wet weather collisions on the “Similar Locations (400 series)” (about 20%) was higher than the proportion of wet weather

---

<sup>241</sup> [Malone Transcript, June 1](#) at pg. 3704 – 3705, ll. 17 to 5.

<sup>242</sup> [Malone Transcript, June 1](#) at pg. 3714, ll. 13 to 20.

<sup>243</sup> [Malone Transcript, June 1](#) at pg. 3706 – 3715, ll. 11 to 11.

<sup>244</sup> [Malone Transcript, May 30](#), at pg. 3319 – 3321, ll. 22 to 19.

<sup>245</sup> [HAM0001095](#) at pg. 4 – 5, Exhibit 008; [HAM0028108](#) at pg. 4 – 5, Exhibit 009.

<sup>246</sup> [Examination of Pedram Izadpanah, September 29, 2022](#) [[“Izadpanah Transcript, September 29”](#)] at pg. 11118 – 11119, ll. 12 to 9.

<sup>247</sup> [CIM0000103](#), Exhibit 058 at pg. 11.

collisions in the Study Area and asked Mr. Malone about any views he formed based on this comparison in 2013. In response, Mr. Malone testified:

I would caution the reading of the first line on the graphics. Similar locations, bracket, 400-series highways, I believe that's been taken from the provincial averages for all 400-series highways and not necessarily highway locations that are similar to this particular piece of the Red Hill Valley Parkway, and you need to recognize that many 400-series highways in Ontario are long, straight, flat sections of highway. So, it's reported here, I recognize that, **but I'm not sure it's directly indicative that the middle line, study area, is worse, other than if you're comparing them to exactly those types of facilities.**<sup>248</sup>

178. Mr. Malone goes on to state that the proportion of wet weather and SMV collisions did not cause him “concern”, noting that roadways or ramps with horizontal alignment or tight curves are more likely to have a higher proportion of wet road collisions and that it is “fairly common for single motor vehicle collisions to be the primary type and the proportion to be that high” on a roadway such as the Red Hill.<sup>249</sup>

179. Mr. Malone’s evidence on this issue is significant because it speaks to how City staff would have understood the safety performance of the Study Area, including the incidence of wet weather and SMV collisions, as well as the urgency with which any countermeasures or investigations would need to be conducted. Indeed, during their examinations, Mr. White and Mr. Ferguson gave similar evidence regarding their understanding of the limitations to CIMA’s collision analysis particularly with respect to the notion that there was a “high” number of wet weather collisions in the Study Area when compared to other facilities.<sup>250</sup>

***b. The City implemented the recommendations in the 2013 CIMA Report***

180. After consultation with CIMA, the City appropriately pursued a staged approach to implementing the recommendations in the 2013 CIMA Report.<sup>251</sup>

181. As previously detailed, barring an urgent or significant safety issue, the evidence indicates that it is common for municipalities to take a staged approach to implementing consultant

---

<sup>248</sup> [Malone Transcript, May 30](#), at pg. 3318 – 3319, ll. 5 to 16.

<sup>249</sup> [Malone Transcript, May 30](#), at pg. 3319 – 3321, ll. 22 to 19.

<sup>250</sup> [White Transcript, June 9](#) at pg. 4801 – 4804, ll. 3 to 12; [Ferguson Transcript, June 6](#) at pg. 3943, ll. 7 to 21.

<sup>251</sup> [Malone Transcript, May 31](#) at pg. 3420 – 3421, ll. 24 to 16; [Applebee Transcript, June 2](#) at pg. 3871 - 3872, ll. 22 to 10.

recommendations as it ensures that municipal resources are being used effectively.<sup>252</sup> This involves pursuing countermeasures that are effective and easy to implement first, evaluating their effect after a reasonable period and then considering additional, more costly options, if required.<sup>253</sup>

182. CIMA expressly acknowledged that the City was taking a staged approach in the 2013 CIMA Report.<sup>254</sup> When asked about this approach during his examination, Mr. Applebee confirmed that he did not have any concerns because the recommendations were not time sensitive.<sup>255</sup>
183. Consistent with the staged approach, the evidence indicates that the City implemented the following countermeasures within the timeframes recommended by CIMA: slippery when wet signs,<sup>256</sup> oversized chevrons, left and right hand signs, a curve warning and slippery when wet signs were installed and upgraded to high intensity sheeting for Ramp 6,<sup>257</sup> flattening terrain or raised guiderail,<sup>258</sup> installing consistent curve warning signage at the Mud St. interchange<sup>259</sup> and installing recessed reflective markers (cat eyes) between Greenhill Avenue to Dartnell Road.<sup>260</sup>
184. City staff advised the Public Works Committee (the “PWC”) of their strategy regarding the staged approach and the matter was appropriately placed on the Outstanding Business List for further reporting once the impact of the signage improvements could be evaluated.<sup>261</sup>
185. The efficacy of the staged approach is best exemplified by the improvement in the proportion of non-daylight collisions. In the 2013 CIMA Report, it was found that the proportion of non-daylight collisions in the Study Area was significantly higher than the

---

<sup>252</sup> See the following section: Part 2, Section D.

<sup>253</sup> [Ferguson Transcript, June 6](#) at pg. 3997 – 3998, ll. 16 to 8.

<sup>254</sup> [HAM0041871](#) at pg. ii, Exhibit 006.

<sup>255</sup> [Applebee Transcript, June 2](#) at pg. 3873, ll. 3 to 10.

<sup>256</sup> [Ferguson Transcript, June 6](#) at pg. 3978, ll. 13 to 24; [HAM0000702](#) at pg. 27, Exhibit 007.

<sup>257</sup> [HAM0042562](#), Exhibit 067 at pg. 1.

<sup>258</sup> [HAM0024142](#) at pg. 2 – 4, Exhibit 006; [RHV0000570](#) at pg. 2 – 4, Exhibit 007.

<sup>259</sup> [HAM0024142](#) at pg. 2 – 4, Exhibit 006; [RHV0000570](#) at pg. 2 – 4, Exhibit 007.

<sup>260</sup> [HAM0024142](#) at pg. 2 – 4, Exhibit 006; [RHV0000570](#) at pg. 2 – 4, Exhibit 007.

<sup>261</sup> [HAM0004376](#) at pg. 3, Exhibit 006.

Hamilton and provincial averages. The 2013 CIMA Report made several recommendations regarding illumination some of which were easy to implement while others were more onerous and costly.

186. Consistent with the staged approach, between the 2013 and 2015 CIMA Reports, the City implemented some of the “low-hanging fruit” countermeasures to improve visibility. Following this, in the 2015 CIMA Report, it was noted that the proportion of non-daylight collisions was “not found to be significantly higher than provincial or municipal averages”<sup>262</sup> and by 2018, the proportion was “consistent with the Provincial averages”<sup>263</sup>, as reported in CIMA’s Detailed Illumination Review Report, dated January 2019 (the “CIMA Illumination Report”).

*c. Some optional recommendations in the 2013 CIMA Report were reasonably not implemented*

187. The Inquiry has received evidence from City staff and CIMA as to why certain optional countermeasures identified in the 2013 CIMA Report, were not immediately pursued by Traffic, Operations and Maintenance staff at the time.
188. CIMA recommended that the City consider conducting friction testing as a short-term measure, defined as 0 to 5 years.
189. Friction testing was included in the 2013 CIMA Report as an optional investigative tool that the City could consider sometime in the next five years. The evidence was clear that it was not identified as an urgent issue.<sup>264</sup> In his testimony, Mr. Ferguson described his understanding of the friction testing recommendation in the 2013 CIMA Report indicating that, in his experience, consultants clearly identify countermeasures that are necessary and ones that are optional and could be implemented as a follow up after the “low hanging fruit” countermeasures or investigations are completed:

So it’s [friction testing] not identified as a high priority type of task that would be expected to be received from a consultant. We obviously have discussions with consultants. We’ll talk to consultants throughout the reports, development of the reports

---

<sup>262</sup> [HAM0000702](#) at pg. 31, Exhibit 007.

<sup>263</sup> [HAM0011581](#) at pg. 11, Exhibit 009a.

<sup>264</sup> [HAM0041871](#) at pg. 38, Exhibit 006.



or the studies and have those types of conversations. And to put that sort of into perspective, you know -- a couple of years ago municipalities were required to undertake railway safety audits, and so within those reports the consultants clearly identified items that had to be completed.

So, again, in our industry we look at the wording that's associated within those reports. So going back to the railway stake. It stated that municipalities or the municipality must complete X work by X date. So it's very clear; it's very upfront. Then they provide the additional information that says municipality can also look at these items; it's not a requirement; you could do it if you want to supplement the location, but it's not an actual requirement.

When you go back and use that as a comparison here, again, it's a lot -- a number of the items are identified as could or to -- as a follow-up, if your pre-countermeasures -- if you find that they are not addressing the situation, then upgrade to these new installations or these additional countermeasures.<sup>265</sup>

190. The Inquiry also received important evidence from Mr. White on his understanding of the friction testing recommendation. Specifically, Mr. White stated that he understood that Mr. Moore had completed friction testing around the same time as the 2013 CIMA Report and believed it was sufficient to address CIMA's recommendation.<sup>266</sup>
191. He further stated that, given the timeline and the optional nature of CIMA's friction testing recommendation and the recommendations Staff had already implemented, Mr. White viewed the friction results as a small component of a series of data points.<sup>267</sup>
192. It is important to note that the City took other steps following the 2013 CIMA Report to reduce the proportion of wet weather collisions by implementing signage related countermeasures that were recommended for the overall Study Area as well as two specific locations that were identified by CIMA as being largely responsible for the proportion of wet weather collisions in the Study Area.<sup>268</sup>
193. During its examination of City staff, Commission Counsel made several inquiries regarding high friction pavement on Ramp 6. The evidence as to why high friction pavement was not installed on Ramp 6 was clear: (1) this was an optional recommendation

---

<sup>265</sup> [Ferguson Transcript, June 6](#) at pg. 4000 – 4002, ll. 6 to 9.

<sup>266</sup> [White Transcript, June 8](#) at pg. 4518 – 4519, ll. 17 to 1.

<sup>267</sup> [White Transcript, June 8](#) at pg. 4517, ll. 7 to 22, pg. 4519, ll. 2 to 8.

<sup>268</sup> [HAM0041871](#) at pg. i to vi, Exhibit 006.

included for future consideration;<sup>269</sup> and (2) the City had already made improvements to Ramp 6, as a result of its Collision Countermeasures program.<sup>270</sup>

194. In its report, CIMA acknowledged that, given the recency of the improvements, the effect of the improved signage on collisions could not be quantified at the time of the 2013 CIMA Review.<sup>271</sup> During his examination, Mr. Applebee confirmed that the signage improvements implemented by the City were reasonable and that CIMA's additional countermeasures were an option to augment the work that the City had already completed.<sup>272</sup>

*vi. **The 2015 CIMA Report***

195. The evidence shows that, following the 2013 CIMA Safety Review of the Study Area, City staff continued to assess the collisions on the Red Hill, particularly as it related to wet weather collisions and by the end of 2014, determined that a review of the entire Red Hill would be prudent.<sup>273</sup> The City subsequently engaged CIMA to perform a comprehensive safety review of the Red Hill in the spring of 2015.
196. The 2015 CIMA Safety Review included a detailed review of all available collision data on the Red Hill, with a focus on median related collisions, a high-level review of the illumination of the roadway<sup>274</sup> and an assessment of potential countermeasures that could reduce the overall collisions and median related collisions on the Red Hill. As part of the review, CIMA and City staff reviewed traffic volumes, speed and collision data, and held multiple meetings and discussions with City staff, which included obtaining input from the

---

<sup>269</sup> For example, see [Lupton Transcript, June 7](#) at pg. 4278 – 4279, ll. 22 to 6.

<sup>270</sup> [CIM0009208](#) at pg. 3, Exhibit 006; [Cooper Transcript, June 13](#) at pg. 5216, ll. 11 to 20.

<sup>271</sup> [HAM0041871](#) at pg. 45, Exhibit 006.

<sup>272</sup> [Applebee Transcript, June 2](#) at pg. 3831, ll. 3 to 16.

<sup>273</sup> [White Transcript, June 8](#) at pg. 4512 – 4513, ll. 20 to 5, pg. 4533, ll. 9 to 23; [White Transcript, June 9](#) at pg. 4598 – 4599, ll. 11 to 9, pg. 4811, ll. 11 to 14; [Ferguson Transcript, August 11](#) at pg. 9618 – 9619, ll. 12 to 2; [HAM0008779](#), Exhibit 006; [HAM0004311](#), Exhibit 006.

<sup>274</sup> In his examination, Brian Malone confirmed that the 2015 CIMA Review was a high-level review of illumination and not comprehensive enough to guide staff recommendation in respect of continuous lighting, as stated in the report to council, dated September 19, 2016. See [Malone Transcript, September 23](#) at pg. 10658 – 10659, ll. 22 to 4.

Public Works, Roads Maintenance staff who often attend to the Red Hill following collisions.<sup>275</sup>

197. Following the review, CIMA identified a number of potential countermeasures to improve the safety performance of the Red Hill, the majority of which were implemented within a two-year period, notwithstanding that the timeline for completion was 0 to 5 years.<sup>276</sup> Specifically, the City implemented the following countermeasures as directed in the 2015 CIMA Report: aggressive speed enforcement, installation of oversized speed limit signs, slippery when wet signs, merge and bridge signs, trimming of vegetation on on-ramps and at guiderail end treatments to improve visibility, upgrade of guiderail end treatments, and installation of object marker at guiderail end treatments.<sup>277</sup>
198. The Inquiry received considerable evidence on the City's response to the 2015 CIMA Report particularly with respect to CIMA's conclusion that a combination of high speeds and wet surface may be the primary contributing factors to collisions on the Red Hill, particularly where small-radius horizontal curves are present.<sup>278</sup> Specifically, the evidence of the City's response indicates that:
- a. Consistent with the staged approach, the City implemented immediate measures to combat the excessive speeding observed by CIMA and the Hamilton Police Services, while investigating potential means to rehabilitate and resurface the Red Hill, which was ultimately done in 2019.
  - b. The City's focus on combating excessive speeding to reduce collisions was consistent with the prevailing understanding of the role of driver behavior and speeding in collisions.
  - c. The City's focus on combating excessive speeding to reduce collisions was reasonable in light of the expert evidence from Dr. Flintsch and Mr. Hein that (1)

---

<sup>275</sup> [CIM0010134](#), Exhibit 007; [HAM0004710](#), Exhibit 007; [Malone Transcript, May 31](#) at pg. 3444 – 3446, ll. 2 to 5.

<sup>276</sup> [Malone Transcript, June 1](#) at pg. 3728 – 3729, ll. 19 to 15; [White Transcript, June 9](#) at pg. 4662, ll. 16 to 20; [Ferguson Transcript, June 6](#) at pg. 4108, ll. 1 to 16.

<sup>277</sup> [HAM0025870](#) at pg. 2, Exhibit 007; [HAM0046147](#) at Appendix A, Exhibit 008.

<sup>278</sup> [HAM0000702](#) at pg. 19, Exhibit 007.

friction is seldom the cause of collisions, but can contribute to collisions in the face of other contributing factors, such as speeding or curvature; (2) it is reasonable to focus on reducing the friction demand by implementing countermeasures to combat other contributing factors such as speeding, instead of increasing the friction values, which can be costly and may not reduce collisions.<sup>279</sup>

- d. Additional friction information would not have resulted in an alternative course of action, as was confirmed by the safety professionals at CIMA.

199. The evidence on these points is summarized below.

*a. The City implemented the recommendations in the 2015 CIMA Report*

200. Consistent with the staged approach to implementation, the City took immediate steps to combat high-speeds while investigating potential ways to rehabilitate and repave the Red Hill in response to CIMA's conclusion that high-speeds and wet surface may be contributing to collisions on the Red Hill.

201. The City took the following steps to target the excessive speeding on the Red Hill following the 2015 CIMA Report:

- a. City staff within the Traffic Operations and Maintenance groups worked with the Hamilton Police Services to implement a comprehensive speed enforcement and education campaign, given the excessive speeding observed by CIMA on the Red Hill. Specifically, CIMA found that over 70% of the vehicles on the Red Hill travelled up to 10 km/h above the posted speed limit with an average of 500 vehicles per day travelling over 140 km/h.<sup>280</sup> The enforcement campaign included regular patrolling on the Red Hill and LINC during which significant speeding violations were observed. For example, within four months of the program, the Hamilton Police Services issued over 1600 violations.<sup>281</sup>

---

<sup>279</sup> See a summary of this evidence in Part I, section "G".

<sup>280</sup> [HAM0000702](#) at pg. 23, Exhibit 007.

<sup>281</sup> [HAM0000772](#) at pg. 3, Exhibit 007.

- b. Oversized speed limit signs and slippery when wet signs were installed.<sup>282</sup>
- c. The City investigated the implementation of variable speed message boards and queue-end warning systems. The City engaged CIMA to prepare and develop a detailed design to implement an automated queue-end warning system which would notify road users of the presence of downstream slow moving or stopped traffic based on near real-time traffic detection on the Red Hill and LINC.<sup>283</sup> Such systems are known to address aggressive driver behaviour and provide a warning to reduce speed.<sup>284</sup> As part of this project, CIMA conducted a review of the collisions on the Red Hill and LINC, including a site review of the Red Hill to determine the locations where sight distances and visibility may be poor due to vertical and horizontal curves throughout the roadway.<sup>285</sup>
202. In his evidence, Mr. Ferguson confirmed that, consistent with the staged approach, following the 2015 CIMA Report, the City focused on the “easy wins” or “low hanging fruit” and sought to reduce the excessive speeding observed on the Red Hill, while understanding that further action with respect to friction testing could be completed at a later date once the City had the opportunity to assess the impact of the initial countermeasures, including signage and speed enforcement.<sup>286</sup> Mr. Ferguson further noted that, based on industry standards, it takes between three to five years to observe the impact of initial countermeasures on collisions and, as such, it was not expected that the collision statistics would immediately capture the benefit of the initial countermeasures.<sup>287</sup>
203. While the Traffic Operations and Maintenance Division implemented countermeasures to combat speeding following the 2015 CIMA Report, as of April 2016, the Engineering Services department took steps to address the pavement rehabilitation needs of the Red Hill

---

<sup>282</sup> [HAM0025870](#) at pg. 2, Exhibit 007; [HAM0046147](#) at Appendix A, Exhibit 008.

<sup>283</sup> [HAM0012754](#) at pg. 1, [CIM0010385](#), Exhibit 008.

<sup>284</sup> [HAM0012754](#) at pg. 1, Exhibit 008.

<sup>285</sup> [HAM0012752](#) at pg. 10, Exhibit 008.

<sup>286</sup> [Ferguson Transcript, June 6](#) at pg. 4108, ll. 3 to 23.

<sup>287</sup> [Ferguson Transcript, August 11](#) at pg. 9456 – 9457, ll. 19 to 2.

and LINC with the general objectives of extending the pavement surface life, increasing the service levels, addressing cracking, and improving skid resistance.<sup>288</sup>

204. In describing the purpose of the resurfacing, Mr. Moore, then the Director of Engineering Services and Richard Andoga, the Senior Project Manager of Infrastructure Programming, both confirmed that although the rehab or resurfacing of the Red Hill was not prompted by concerns that the friction on the Red Hill was deficient, there was an understanding that new rehab or resurfacing would naturally result in increased skid resistance.<sup>289</sup> Mr. Andoga further confirmed that the Engineering Services division understood that the Red Hill would require better skid resistance than the LINC because of the excessive speeding observed on the roadway, the volume, and the curvature alignment.<sup>290</sup>
205. By 2017, the City was taking steps to resurface the Red Hill, and spent considerable resources investigating the feasibility of hot-in-place recycling, which would have resulted in significant savings and efficiencies.<sup>291</sup> Ultimately, the City decided to pursue a traditional shave and pave resurfacing later in 2018.

***b. The City's focus on combating excessive speeding was consistent with the information available at the time***

206. The City's focus on combating high-speeds is consistent with the best information that was available at the time with respect to the role that speeding and driving behaviour played in collisions. Mr. Ferguson's evidence is particularly helpful in this regard:
- a. Mr. Ferguson confirmed his understanding that there are a number of contributing factors to any one collision, however, generally the primary factor that is identified in collisions across North America is driver behaviour, and that this was particularly the case in wet weather conditions.<sup>292</sup>

---

<sup>288</sup> [HAM0033919](#) at pg. 2, Exhibit 007; [Examination of Richard Andoga, dated June 27, 2023](#) ["**Andoga Transcript, June 27**"] at pg. 6734, ll. 12 to 21, pg. 6740 – 6744, ll. 17 to 21.

<sup>289</sup> [Moore Transcript, July 19](#) at pg. 8649, ll. 2 to 21.

<sup>290</sup> [Andoga Transcript, June 27](#) at pg. 6740 – 6742, ll. 17 to 1, pg. 6744, ll. 16 to 21.

<sup>291</sup> [HAM0001264\\_0001](#) at pg. 1-2, Exhibit 009.

<sup>292</sup> [Ferguson Transcript, June 6](#) at pg. 4046 – 4047, ll. 7 to 16.

- b. When asked if his focus on driver behaviour would have changed if he was advised that in their report, Tradewind recommended further investigation of the friction values of the Red Hill, Mr. Ferguson confirmed that in the absence of a specific recommendation of what “further investigation” entailed or a conclusion on whether the friction values “passed”, “failed” or were “inconclusive”, it would have been prudent to focus on minimizing the excessive speeding observed on the Red Hill.<sup>293</sup> Mr. Ferguson further confirmed that his understanding of which countermeasures were necessary to implement following the 2015 CIMA Report, would not have been impacted if he was aware that Tradewind recommended “further investigation”.<sup>294</sup>
- c. Mr. Ferguson noted that the focus on driver behaviour was consistent with information the City received from the Hamilton Police Services that the primary issue on the Red Hill was driver behaviour.<sup>295</sup> For example, the Hamilton Police Services advised that between December 2015 to February 2018 over 90% of the Provincial Offences Notices they issued were for speeding and 53% were for speeding violations exceeding 120 km/hour.<sup>296</sup>
- d. When asked what expertise Hamilton Police Services bring to assessing collisions, Mr. Ferguson stated that, for most police reported collision, Hamilton Police prepare an investigative report identifying the factors contributing to the collision.<sup>297</sup> These police reports are the source of the collision data that is maintained by the City.

207. Mr. Malone provided similar evidence regarding the role of driver behaviour in collisions:

... the importance of friction in the diagnosis, in the determination of factors that may be causal factors in collisions was not clear at all. In fact, there were other factors that were much more clearly identified, including speed, and potentially driver behaviour.<sup>298</sup>

---

<sup>293</sup> [Ferguson Transcript, August 11](#) at pg. 9496, ll. 3 to 23.

<sup>294</sup> [Ferguson Transcript, August 11](#) at pg. 9493, ll. 1 to 10.

<sup>295</sup> [Ferguson Transcript, August 11](#) at pg. 9496 – 9497, ll. 20 to 14; [HAM0001139](#) at pg. 1, Exhibit 008.

<sup>296</sup> [HAM0001139](#) at pg. 1, Exhibit 008.

<sup>297</sup> [Ferguson Transcript, August 11](#) at pg. 9497, ll. 1 to 14.

<sup>298</sup> [Malone Transcript, June 1](#) at pg. 3738, ll. 1 to 8.

208. The role of speeding as the primary contributing factor to collisions on the Red Hill was confirmed by CIMA in January 2018. As part of the ongoing monitoring of the Red Hill and in advance of an upcoming PWC meeting, the City asked CIMA to prepare a collision rate analysis of the Red Hill to compare to other MTO facilities. Based on collision data from 2009 to 2013, the analysis showed that the Red Hill had a lower average weighted collision rate at 0.35 when compared to the MTO facilities, which had a collision rate between 0.59 to 0.79.<sup>299</sup> In his examination, Mr. Ferguson noted that the 2018 CIMA Memo gave him comfort that the Red Hill was operating in a manner that was consistent with other MTO facilities relying specifically on the segment between Westchester and Fourth Avenue on Highway 406 as it had a similar geometrics to certain Red Hill segments.<sup>300</sup>

RHVP				
LINC – Mud	1.6	33	0.17	
Mud – Greenhill	2.6	88	0.30	
Greenhill – King	1.3	90	0.66	
King – Queenston	0.8	26	0.33	
Queenston – Barton	1.3	38	0.31	
Barton – Railway Overpass	0.5	31	0.67	
<b>Average Weighted Collision Rate</b>			0.36	

Table 2: Average Collision Rates for Comparison Sites (2009 - 2013)

Highway / Section	Length (km)	Collisions (2009 - 2013)	Collision Rate
<b>Highway 406</b>			
Highway 58 – Glendale	2.0	78	0.37
Glendale – Westchester	3.0	157	0.53
Westchester – Fourth Avenue	2.3	232	1.59
Fourth Avenue - QEW	3.9	130	0.67
<b>Average Weighted Collision Rate</b>			0.77
<b>Highway 7/8</b>			
Conestoga/Victoria – Ottawa	1.5	171	0.57
Ottawa – Highway 8/King	1.3	146	0.64
Highway 8/King – Courtland	1.4	156	0.68
Courtland – Homer Watson	1.3	122	0.61
Homer Watson – Fischer-Hallman	2.6	176	0.67
Fischer-Hallman - Trussler	2.9	77	0.45
<b>Average Weighted Collision Rate</b>			0.59
<b>Highway 8</b>			
Sportsworld – Fairway	3.6	491	0.99
Fairway – Highway 7	2.2	188	0.46
<b>Average Weighted Collision Rate</b>			0.79

209. Upon being advised that, although the collision rates on the Red Hill were lower than the MTO facilities, the proportion of injury (including minor injury) and fatality collisions were higher, Mr. Ferguson asked Mr. Izadpanah of CIMA to explain this difference and

<sup>299</sup> [HAM0001095](#) at pg. 3, Exhibit 008.

<sup>300</sup> [Ferguson Transcript, August 11](#) at pg. 9534 – 9535, ll. 12 to 7.



specifically to confirm whether speeding was the primary cause of the high proportion of injury and fatal collisions on the Red Hill. In response, Mr. Izadpanah confirmed that “speed is definitely a major cause” and advised that he would look into the issue further, including into whether the “comparison highways have a more forgiving environment”.<sup>301</sup> Upon completing his assessment, Mr. Izadpanah confirmed that “speed is the problem”.<sup>302</sup>

*c. Friction testing would not have resulted in different safety recommendations*

210. The evidence confirmed that the countermeasures recommended by CIMA in the 2015 CIMA Report would not have changed had CIMA received friction testing results or copies of the Tradewind Report or the 2014 Draft Golder Report.
211. Mr. Malone confirmed that friction testing results would not have changed the countermeasures recommended in the 2015 CIMA Report because CIMA’s recommendations already intended to “deal with” any potential low friction such that any further friction results would not have warranted additional countermeasures.<sup>303</sup>
212. Mr. Malone’s evidence is consistent with CIMA’s memo dated February 4, 2019 [the “**CIMA February 4<sup>th</sup> Memo**”], which concludes that CIMA would not have recommended that the City implement any additional countermeasures in the 2015 CIMA Report or as of November 2018, even if CIMA had received a copy of the Tradewind Report or the 2014 Draft Golder Report.<sup>304</sup>
213. When examined on this issue, Mr. Malone reiterated CIMA’s conclusion in the CIMA February 4<sup>th</sup> Memo and went on to state that CIMA would not have changed its assessment regarding the role of wet surface and high-speeds as a potential contributor to collisions if it had a copy of the Tradewind Report or the 2014 Draft Golder Report when completing the 2015 CIMA Report.<sup>305</sup>

---

<sup>301</sup> [HAM0001105](#) at pg. 2, Exhibit 008.

<sup>302</sup> [HAM0001102\\_001](#), Exhibit 008.

<sup>303</sup> [Malone Transcript, May 31](#) at pg. 3488 – 3489, ll. 17 to 2.

<sup>304</sup> [HAM0054375](#) at pg. 2 – 3, Exhibit 009a; [Malone Transcript, October 31](#) at pg. 15013 – 15014, ll. 11 to 12.

<sup>305</sup> [Malone Transcript, October 31](#) at pg. 14942 – 14943, ll. 1 to 9.

214. Notably, Mr. Malone goes on to state that, on the contrary, theoretically the Tradewind Report could have led CIMA to rule out friction as a contributory factor in the 2015 CIMA Report:

Q. So you would not have changed the way that you approach, that is, you CIMA, approached the assessment of friction as a contributing factor to collisions if you had had the Tradewind report and Golder report in 2015?

A. Yeah. Yes, I think that's correct. I mean, the problem with the results of the Tradewind report is that they indicate, in my interpretation, friction levels that are in excess of the values that are utilized in road design. So theoretically, that should mean that friction is not an issue because the friction levels are provided. We have a preponderance of wet road crashes. **We -- I don't think it [the Tradewind Report] would be the smoking gun of confirmation that pavement surface was the key factor and problem in the resulting consequences of these collisions. So I don't believe -- I don't think that our recommendations would have changed significantly overall. Wet road crashes are still problematic. They are at a proportion which is too high. We have more information regarding friction, but I still have, based on my interpretation now, information about friction which indicates it's -- exceeds, is more than the values used in design, and then therefore theoretically are not an issue.**

Is there a different friction problem beyond the straight comparison of those numbers? That is something there, and that's where further evaluation of the pavement could be potentially useful, which is what was recommended and was ultimately done.<sup>306</sup>

*d. The pavement friction experts agree with the City's approach to focus on minimizing excessive speeding*

215. The Inquiry received expert evidence on the role friction plays in collisions from Dr. Flintsch, the pavement friction expert put forward by Commission Counsel and Mr. Hein, the pavement friction expert put forward by the City and the only witness with expertise in Canadian friction management practices.

216. As previously discussed in Section I, both experts agree that “deficient friction is seldom the main cause of a crash”<sup>307</sup> although there may be situations where friction could contribute to a collision in the face of other contributing factors such as speeding or driver error.<sup>308</sup>

---

<sup>306</sup> [Malone Transcript, October 31](#) at pg. 14942 – 14943, ll. 1 to 9.

<sup>307</sup> [Flintsch Primer Expert Report](#) at pg. 19; [Hein Expert Report](#) at pg. 16.

<sup>308</sup> [Flintsch Transcript, February 16](#) at pg. 15691, ll. 3 to 15.

217. Importantly, both Mr. Hein and Dr. Flintsch agree that, in these circumstances, increasing the friction values or decreasing the demand for friction would avoid collisions or reduce the severity of collisions.<sup>309</sup>

218. In his examination, Dr. Flintsch agreed that, in the face of CIMA's conclusion that the primary cause of collisions on the Red Hill may be a combination of excessive speeding and wet surface, countermeasures that either increase the friction values or decrease the demand for friction by targeting speeding, would avoid or reduce the severity of collisions:

Q. All right. And so, based on collision analysis, CIMA in that report concluded that a combination of speeding and wet surface conditions may be contributing to the wet weather collisions on the Red Hill. Does that accord with your recollection?

A. Yes.

Q. And, you know, just considering the conversation we've been having, we can't generalize which one of those factors would be the primary contributor. Correct?

A. I agree.

Q. Okay. So, if a countermeasure were to be deployed that reduces speeding, for example, that, as we discussed, could reduce the demand for friction. Right?

A. Yes.

Q. Okay. And countermeasures like those ones could also, then, reduce or result in a reduction of the number of collisions or reduce the severity of the collision?

A. Yes.<sup>310</sup>

219. In his examination, Mr. Hein provided similar evidence noting that reducing the speed would not change the pavement surface, but it would reduce the demand for higher friction in the absence of high-speeds.<sup>311</sup>

220. Mr. Hein also highlighted the practical realities when choosing between reducing the demand for friction and increasing friction values from an effectiveness and cost-efficiency standpoint, noting that: (1) increasing friction values will not necessarily decrease the

---

<sup>309</sup> [Flintsch Transcript, February 16](#) at pg. 15691 - 15692, ll. 3 to 7.

<sup>310</sup> [Flintsch Transcript, February 16](#) at pg. 15692 - 15693, ll. 23 to 14.

<sup>311</sup> [Hein Transcript, February 24](#) at pg. 16303 - 16304, ll. 16 to 19.

number of collisions, particularly as most accidents are not caused by friction; and (2) decreasing friction demand is a more cost-effective measure than increasing friction values:

A. There are many things that you can do to reduce the demand. Again the signage, the reducing the speed limit, et cetera, usually those activities are much less expensive than providing more friction. Providing more friction you're going to either remove and replace a surface, put other types of surfaces on top of them, and they can be significantly more expensive and not necessary if you can develop it in another manner like signage or speed enforcement.

Q. Would in your view increasing friction necessarily decrease or reduce collisions?

A. No, it wouldn't necessarily reduce them no, correct.

Q. Why is that?

A. There may be no influence of the collisions interacting with the friction. That's why you're doing a collision analysis to help identify locations where potentially it was friction that contributed to the accident, and in my experience the majority of accidents are not -- don't have anything to do with friction.<sup>312</sup>

221. When asked how long it would take to validate a decrease in friction demand, Mr. Hein stated that, given the variability of collisions and traffic information, it would take at least three years to assess the impact of decreasing the friction demand on collisions.<sup>313</sup>

222. The evidence from Dr. Flintsch and Mr. Hein indicates that the steps taken by the City to reduce the demand for friction by combatting excessive speeding, before proceeding to resurface the Red Hill three years following the 2015 CIMA Report, was a reasonable course of action and consistent with the staged implementation approach identified by Ms. Baker.<sup>314</sup>

vii. ***The City Undertook Additional Consultant Studies to Maintain and Improve the Red Hill***

223. The City expended significant resources to engage CIMA to complete a number of other studies relating to the Red Hill, including the 2018 Roadside Safety Assessment, the Illumination Review and the Speed Study, as detailed below.

---

<sup>312</sup> [Hein Transcript, February 24](#) at pg. 16305 – 16306, ll. 9 to 6.

<sup>313</sup> [Hein Transcript, February 24](#) at pg. 16304 – 16305, ll. 19 to 4.

<sup>314</sup> [Baker Transcript, February 22](#) at pg. 15963, ll. 1 to 9.

224. The City engaged CIMA to complete a feasibility study and identify the benefits, risks, costs, and challenges of adding continuous lighting along the LINC and Red Hill.<sup>315</sup> The study confirmed that neither the LINC nor the Red Hill were found to have a disproportionate number of collisions occurring during hours of darkness.<sup>316</sup>
225. The City engaged CIMA to complete a detailed review of the operating speeds along the LINC and Red Hill and to provide a recommendation regarding a safe posted speed limit consistent with sound engineering practices and driver expectations. CIMA completed a comprehensive literature review to identify the best approaches for setting posted speed limits. CIMA also arranged for a review of the speed traffic data to evaluate prevailing traffic conditions. Although CIMA concluded that the posted speed for the Red Hill was appropriate, the City decided to reduce the speed limit to 80 km/h from the Greenhill Interchange to the Queen Elizabeth Way.<sup>317</sup>
226. In preparing for the resurfacing, the City appropriately engaged CIMA to provide recommendations to reduce collision frequency and severity, and to upgrade the roadside safety devices to match current standards in the 2018 Roadside Safety Assessment.<sup>318</sup> As a result of the review, a number of improvements were made to the Red Hill following the resurfacing, including higher quality durable pavement markings, shoulder rumble strips for the entire length of the Red Hill, reflective markers along center medians and guardrails and post mounted reflective markers.<sup>319</sup>

**E. The City Concluded that No Interim Measures on the Red Hill were Necessary Prior to the Resurfacing**

227. The Inquiry received extensive evidence on whether any interim safety measures were necessary in the fall of 2018 in advance of the resurfacing of the Red Hill in the spring of 2019 in light of the conclusions in the Tradewind Report and 2014 Draft Golder Report.

---

<sup>315</sup> [HAM0029112](#) at pg. 1, Exhibit 010a.

<sup>316</sup> [HAM0029112](#) at pg. 1, Exhibit 010a.

<sup>317</sup> [RHV0000576](#) at pg. 2, Exhibit 010a.

<sup>318</sup> [Soldo Transcript, September 12](#) at pg. 10376, ll. 7 to 23.

<sup>319</sup> [HAM0029133](#) at pg. 6, Exhibit 10a.

The evidence indicates that the City reasonably concluded that it was not necessary to implement interim measures on the Red Hill for the following reasons:

- a. Public Works staff and particularly Mr. Soldo decided that additional measures were not necessary on the basis that (1) the Tradewind Report and the 2014 Draft Golder Report did not identify any safety issues; (2) the resurfacing of the Red Hill would address the recommendations in these reports; (3) various improvements were implemented on the Red Hill since 2014; (4) the collision data indicated that the Red Hill was operating safely in 2018.
- b. Dr. Flintsch and Dr. Hein agreed that it was not necessary for the City to consider any pavement rehab interim measures between 2018 and the resurfacing.
- c. CIMA confirmed that no interim measures were necessary in light of the resurfacing.

***i. Public Works Staff Assessed the Safety of the Road and Considered the Need for Interim Measures***

228. The Inquiry received extensive evidence from members of the Public Works leadership team regarding why interim measures were not necessary. Edward Soldo, the Director of Traffic Operations and Maintenance, the division responsible for the maintenance and safety of the Red Hill, particularly gave compelling evidence on this issue.

***a. Mr. Soldo confirmed that the Red Hill was operating safely in the fall of 2018***

229. Mr. Soldo is a Professional Engineer with over two decades of experience as a traffic safety professional. Between 2017 and 2019, Mr. Soldo was the President of the Canadian Institute of Transportation Engineers. Prior to joining the City in July 2018, Mr. Soldo was the Director of Roads and Transportation for the City of London for six years.<sup>320</sup>

---

<sup>320</sup> [Soldo Transcript, September 12](#) at pg. 10260, ll. 4 to 13.

230. In his evidence, Mr. Soldo stated that he concluded that the Red Hill was operating safely in 2018 based on his assessment of the collision patterns on Red Hill between 2013 and 2017, as detailed in 2017 Annual Collision Report Presentation.<sup>321</sup>

231. When asked by Commission Counsel whether Mr. Soldo had any concerns regarding the higher proportion of wet weather collisions on the Red Hill compared to the LINC, Mr. Soldo emphasized the importance of looking at the collision data holistically and not solely focusing on the proportion of wet weather collisions.<sup>322</sup>

You know, we would have had a discussion about, you know, there is the high proportion, but we also would have had a discussion about the other characteristics that are identified in the report itself, because this is just one and when you're looking at this, **you know, to a layperson it's very easy to jump to conclusions in terms of what this means, but you really have to look at this characteristic in the overall scheme of all the data that you have.**<sup>323</sup>

232. One of the key characteristics that Mr. Soldo identified was that the number of police reported collisions on the Red Hill was declining from 2015 to 2017, approximately two to three years following the implementation of the countermeasures identified in the 2013 and 2015 CIMA Reports.<sup>324</sup> Mr. Soldo further noted that this reduction could be a result of the various countermeasures the City implemented on the Red Hill since 2013 as the impact of countermeasures on collisions is generally not immediately observable.<sup>325</sup>

233. Mr. Soldo also identified that the proportion of severe collisions on the Red Hill was in fact lower than the proportion of such collisions on the LINC, suggesting that the Red Hill had a better safety performance than the LINC from a Vision Zero perspective.<sup>326</sup> This is a particularly significant statistic considering that, given the geometrics of the LINC and Red Hill, the Red Hill would be expected to have a higher proportion of severe collisions.

---

<sup>321</sup> [Soldo Transcript, September 12](#) at pg. 10408, ll. 10 to 25, 10282 – 10296, ll. 13-23.

<sup>322</sup> [Soldo Transcript, September 12](#) at pg. 10280 – 10282, ll. 11 to 3.

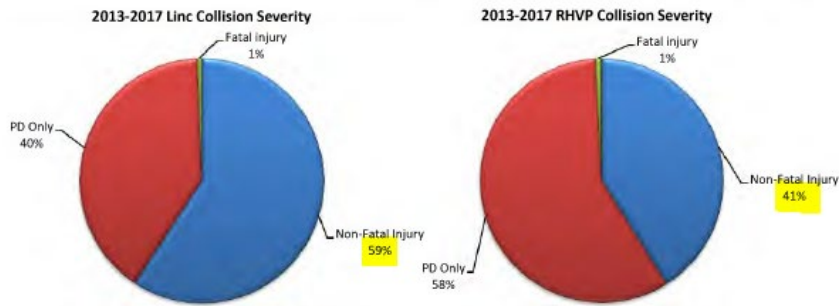
<sup>323</sup> [Soldo Transcript, September 12](#) at pg. 10281 – 10282, ll. 16 to 3.

<sup>324</sup> [Soldo Transcript, September 12](#) at pg. 10288, ll. 14 to 20; [HAM0001402](#) at pg. 41, Exhibit 009a.

<sup>325</sup> [Soldo Transcript, September 12](#) at pg. 10288, ll. 8 to 20.

<sup>326</sup> [Soldo Transcript, September 12](#) at pg. 10289, ll. 9 to 23; [HAM0001402](#) at 43, Exhibit 009a.

**SECTION 6**  
**2013-2017 LINCOLN ALEXANDER PARKWAY & RED HILL VALLEY PARKWAY 5 YEAR COLLISION TRENDS**



234. Mr. Soldo highlighted the importance of these two sets of statistics from a Vision Zero perspective, which focuses on reducing collisions that cause injury, including police reported and severe collisions:

First and foremost, you know, the City has adopted a Vision Zero approach to roadway safety and the **real goal of Vision Zero is to reduce the number of fatal and severe fatalities that occur on the roadway.**<sup>327</sup>

...So, the total number of collisions there goes up, which is to be expected given the fact that volumes go up and population goes up. But when I'm looking at the, I guess, I want to say, the effect of this on the program that the City is undertaking, I'm looking at primarily the injury collisions and the fatal collisions and that chart, sort of, shows that they're going down, at least in 2017, because that's really the goal of Vision Zero. **We understand that there's going to be collisions, but if you do have collision, you want to ensure that we have less severe collisions.**<sup>328</sup>

...And my takeaway from here is both are getting better from an injury and fatal perspective in terms of numbers.<sup>329</sup>

235. With respect to driver behaviour, the 2017 Annual Collision Report Presentation identified that the proportion of speeding was significantly higher on the Red Hill than the LINC as was the proportion of improper driving.<sup>330</sup> Mr. Soldo noted that these statistics were consistent with the prevailing view that speed was the primary cause of collisions on the Red Hill and could explain why the higher proportion of wet weather collisions on the Red Hill.<sup>331</sup>

<sup>327</sup> [Soldo Transcript, September 12](#) at pg. 10 283, ll. 9 to 13.

<sup>328</sup> [Soldo Transcript, September 12](#) at pg. 10283 – 10284, ll. 23 to 10.

<sup>329</sup> [Soldo Transcript, September 12](#) at pg. 10285 – 10286, ll. 19 to 7.

<sup>330</sup> [HAM0001402](#) at 46, Exhibit 009a.

<sup>331</sup> [Soldo Transcript, September 12](#) at pg. 10290 – 10292, ll. 23 to 21.



236. Lastly, Mr. Soldo noted that the Red Hill mainline did not appear on the City's Network Screening list for 2013 to 2017, as indicated in the 2017 Annual Collision Report Presentation.<sup>332</sup> As previously detailed, the Network Screening List identifies the road segments in the City that are overrepresented in terms of collisions.<sup>333</sup>
237. Mr. Soldo acknowledged that three of the Red Hill ramp locations are identified on the Network Screening list, however, it should be noted that there are no roadways in Hamilton similar to the Red Hill, particularly with respect to the speed limit and curvature, such that these particular ramps may be expected to have a higher relative number of collisions.
- b. It was not necessary to implement interim measures on the Red Hill prior to resurfacing***
238. As detailed below, Mr. Soldo stated that he did not believe any interim measures were necessary on the Red Hill prior to resurfacing, in light of the conclusions in the Tradewind Report and the 2014 Draft Golder Report because:
- a. the Tradewind Report and 2014 Draft Golder Reports did not identify any safety issues or identify a timeline (immediate or otherwise) for the completion of remedial work;
  - b. the Red Hill was scheduled to be repaved in short order, which would address any issues identified in the reports;
  - c. the City implemented a number of countermeasures on the Red Hill following the various reviews completed by CIMA since the Tradewind Report and the 2014 Draft Golder Report in 2014, such as slippery when wet signs; and
  - d. the collision data that detailed in the 2017 Annual Collision Report indicated that the Red Hill was operating safely.
239. Mr. Soldo stated that the Tradewind Report or the 2014 Draft Golder Report did not raise any red flags for him as the reports did not identify any safety issues, immediate or

---

<sup>332</sup> [HAM0001402](#) at pg. 60, Exhibit 009a.

<sup>333</sup> [Soldo Transcript, September 12](#) at pg. 10294 – 10296, ll. 11 to 9.

otherwise.<sup>334</sup> Given that the City was planning to resurface the entire Red Hill in short order, Mr. Soldo was satisfied that this would sufficiently address the recommendations in the Tradewind Report which was that further investigation and “possible” remedial work be completed in the future. He was also satisfied that it would address the recommendations in the 2014 Draft Golder Report, that the City consider micro-surfacing parts of the Red Hill, primarily to deal with cracking.

So, my takeaway when I'm reading that is, okay, they're proposing to do work that we currently have necessarily ready on their way. We have the pavement rehabilitation that's undergoing. You know, it's going to be going out to tender shortly. They were actually recommending sections and we're doing the entire thing. So, from that portion, I'm thinking this aligns with work that we're doing. And, you know, when I'm looking at this report, I'm looking at it more from also the safety perspective and, you know, it's indicated that there's lower friction values, but there's nothing in terms of, you know, that there's an immediate safety issue or anything like that.<sup>335</sup>

**So, that's kind of my first initial blush. Nothing here is -- there's no red flags in that report for me when I'm looking at it. I'm not specifically looking at it from the pave and engineering perspective. You know, that's what Gord is looking at in terms of what he is going to be -- what kind of pavement he is going to put down, what he should be doing potentially in terms of following up with more investigation and doing friction testing. I'm looking at it very much is there something in here that is of immediate nature? Is there something that says the road is unsafe?...<sup>336</sup>**

**I don't see anywhere in this report that there's immediate safety concern. I would expect if this is a report we getting from engineering company there was something that was immediately had to be done, that would be identified. It doesn't say the road is unsafe. It doesn't identify any immediate actions.<sup>337</sup>**

240. Commission Counsel made repeated inquiries regarding whether Mr. Soldo shared information about the Tradewind Report and 2014 Draft Golder Report with CIMA. Mr. Soldo was clear in his evidence that while he considered sending CIMA a copy of the Tradewind Report and 2014 Draft Golder Report, he ultimately decided that there was little value in sharing draft reports from 2014 with CIMA, that did not raise any safety issues, particularly considering CIMA was undertaking its own review.<sup>338</sup>

---

<sup>334</sup> [Soldo Transcript, September 12](#) at pg. 10395 – 10396, ll. 17 to 8.

<sup>335</sup> [Soldo Transcript, September 12](#) at pg. 10395 – 10396, ll. 17 to 8.

<sup>336</sup> [Soldo Transcript, September 12](#) at pg. 10397, ll. 13 to 25.

<sup>337</sup> [Evidence of Edward Soldo, dated November 1, 2022](#), [“**Soldo Transcript, November 1**”] at pg. 15277 – 15278, ll. 19 to 12.

<sup>338</sup> [Soldo Transcript, September 12](#) at pg. 10403 – 10405, ll. 20 to 4; see also [Soldo Transcript, November 1](#) at pg. 15229, ll. 15 to 24.

In terms of value to provide to CIMA, that report doesn't indicate any, you know, immediate safety concerns, doesn't say if the road is safe, so at this point, you know, I'm trying to see what was going to come back from Golder in terms of, you know, any potential changes to the scope itself...CIMA was undertaking their own independent review of the all the accident collisions at this point, doing their analysis, so from looking at all those conditions as well. And I'm going to go back to what I spoke about earlier. **You know, friction is one element. You know, friction itself on its doesn't have a direct link, causal link, to collisions. It's just one element,** so I was waiting to get some feedback from Golders, but at the same time we had -- was, you know, assured by the fact that we already had CIMA under retainer undertaking their safety assessment and they would be coming back to us with recommendations.<sup>339</sup>

241. Mr. Soldo's evidence is consistent with Mr. Malone's evidence on this issue. Mr. Malone was clear in his evidence that he would not have expected the City to provide CIMA with the Tradewind Report and the 2014 Draft Golder Report as part of the 2018 Roadside Safety Assessment, noting that these reports were relevant for the resurfacing, but that CIMA had no need for the reports in the context of the 2018 Roadside Safety Assessment.<sup>340</sup>

242. When asked if the "Tradewind Report friction values" caused Mr. Soldo to reassess the view that collisions were primarily caused by speeding or driver behaviour in 2018, Mr. Soldo reiterated that he did not believe there was a safety concern on the Red Hill considering the imminent resurfacing, the 2018 Roadside Safety Assessment and the fact that the City had implemented a number of countermeasures on the Red Hill over the years, including slippery when wet signs.<sup>341</sup>

...I put that linkage together that, you know, we need to further review on how this is impacting potentially longer term, you know, the collision rates and everything else. But at that point as well I know that we had CIMA undertaking that work. **We had put in place a number of measures previously through the previous report from CIMA related to speeding, related to slippery when wet, so I considered, you know, at this point was there any safety concern on the roadway and I didn't believe there was.**<sup>342</sup>

243. Commission Counsel spent considerable time examining Mr. Soldo on whether he considered engaging CIMA or other consultants to review the Tradewind Report. Mr. Soldo was clear in his evidence that he understood that Gord McGuire, the Director of

---

<sup>339</sup> [Soldo Transcript, September 12](#) at pg. 10404 – 10405, ll. 9 to 4.

<sup>340</sup> [Malone Transcript, September 23](#) at pg. 10787 – 10788, ll. 13 to 18.

<sup>341</sup> [Soldo Transcript, September 12](#) at pg. 10405 – 10406, ll. 5 to 10; see also [Soldo Transcript, November 1](#) at pg. 15227 – 15228, ll. 19 to 24.

<sup>342</sup> [Soldo Transcript, September 12](#) at pg. 10405 – 10406, ll. 24 to 10.

Engineering Services at Public Works at the time, was following up with Golder to better understand the Tradewind Report and the 2014 Draft Golder Report. In light of this, given that CIMA was already undertaking the 2018 Roadside Assessment and his own assessment that the Red Hill was operating safely, he did not believe that there was a need for a further consultant review.

Q. Did you understand that Mr. McGuire would be retaining an expert to provide an assessment of what these friction values meant?

A. My understanding was they were following up with Golder. I'm not sure if not only - - I was under the impression they were following up with Golder in terms of next steps.

Q. Okay. Did you consider retaining a consultant to provide an opinion about the potential correlation between the friction values in the Tradewind report and the wet weather collision rates that had been identified over time?

A. I did not. We already had CIMA under contract to do a safety assessment and they were going to do that work independently.

Q. ... I'm correct that the roadside safety assessment doesn't deal with pavement surface. Right?

A. It deals with undertaking an assessment of the collisions, trying to ascertain, you know, what are the root causes of some of those collisions, but primarily the work was actually focused on the roadside safety assessment.

Q. Okay. So, CIMA was under contract to do a roadside safety assessment that did not include assessing the pavement surface. Why didn't you consider retaining a consultant to provide an opinion about the potential correlation between the friction values in the Tradewind report and the wet weather collisions that had been found over time?

A. At that point, you know, we had CIMA, I indicated earlier, already under contract. There's nothing in that report that came to us from Tradewind or from Golder that identified an immediate need or any, you know, immediate safety concerns, nothing that, sort of, stuck out from something that we need to undertake right away. We knew that we had the resurfacing scheduled, you know, in a couple of months, so at this point, you know, I felt we were operating with a safe roadway and we were putting in steps in terms of moving forward with the resurfacing of that roadway.

Q. You said you felt "we were operating with a safe roadway." What assessment did you do to come to the conclusion that the RHVP was safe in the fall of 2018?

A. Going back to the annual collision report, it doesn't -- when you look at those numbers in the annual collision report, it doesn't identify that the Red Hill is operating at unacceptable levels. It's operating pretty comparable to, you know, in terms of -- going back in my earlier discussions, when you look at those metrics, there's nothing that stands out in there that it was operating at an unsafe level. Those are consistent -- those were very recent numbers we're looking at, too. We're looking at the last five years.<sup>343</sup>

---

<sup>343</sup> [Soldo Transcript, September 12](#) at pg. 10406 – 10408, ll. 11 to 25; see also [Soldo Transcript, November 1](#) at pg. 15037 – 15041, ll. 15 to 15.

244. In the examination, Commission Counsel questioned the value of the 2018 Roadside Assessment because it “did not include assessing the pavement surface”. However, as explained by Mr. Malone the purpose of the Roadside Safety Assessment included a consideration of how to reduce the frequency and severity of collisions, including any collisions in which friction and speeds may play a contributing factor.

A. Yeah. I think it's -- the roadside hazard aspect of the report is trying to deal with collisions that could result in greater harm in conjunction with leaving the road. **So, if there's a crash as a result of a vehicle leaving the road and if that crash is connected with the friction on the surface, then you do -- you are addressing a roadside hazard crash because you prevent a vehicle from leaving the road. So, there's a direct link between the two,** so I would disagree that they're disconnected. There's a direct connection between them. **A loss of control crash that goes into the roadside, you know, originates on the road, and if it originates because of the pavement surface, then there is a connection.**

Q. Okay. So, is that to say in other words the roadside safety assessment, to the extent that it's looking at roadside hazards, it's really looking at everything, including pavement?

A. It's not looking at the pavement itself. **What we're trying to -- we're looking at two aspects of where collisions originating from? Is it possible to potentially reduce those collisions from happening? And secondly, if collisions are occurring in the roadside environment, are we able to mitigate the consequences of those collisions by removing specific hazards. So, there's a connection between both and, if you can prevent a collision, a vehicle from leaving the road, then you've prevented what will become a roadside hazard issue.**<sup>344</sup>

245. Commission Counsel goes on to ask Mr. Malone why the 2018 Roadside Assessment did not reference CIMA’s earlier recommendation to complete friction testing given that some of the recommendations seek to address the impact of pavement surface and speed, on collisions. In his response, Mr. Malone notes that he does not see the relevance of friction testing results from five years prior, particularly given that the Red Hill was about to be paved:

Q. ...The recommendations, as I interpret them, relate either to pavement resistance, skid resistance, like the first one, or to dealing with speed or wet weather conditions,... It seems that there's quite a correlation between these recommendations and speed or pavement surface. Would you agree with that?

A. There's a connection between speed and pavement surface.

Q. That's a much better way to say it. A connection, not a correlation.

---

<sup>344</sup> [Malone Transcript, September 23](#) at pg. 10825 – 10826, ll. 13 to 21.

A. ... the pavement surface, the vehicle interaction with the pavement surface, is directly correlated with the speed as which the vehicle is travelling. And, as you saw previous table, the TAC table, the assumption on all of those curve radii values is a constant friction value, and so your ability to traverse a given radius changes and you have to, should be, going at a lower speed at tighter curves because you're unable to traverse it at some point or it becomes more problematic...

Q. ...The recommendations here, the very first one and the fourth one, both deal with pavement surface expressly. Why did this report not include reference to CIMA's earlier recommendations for friction testing?

A. Well, I guess the first answer to that would be the pavement is about to be removed, so the relevance of friction testing that was done five years ago is -- doesn't connect with me....<sup>345</sup>

246. Mr. Malone and Mr. Soldo's evidence confirms that the friction information contained in the Tradewind Report or the 2014 Draft Golder Report did not warrant any immediate action by the City from a safety perspective, particularly in light of the pending resurfacing, the 2018 Roadside Assessment and the safety improvements already implemented on the Red Hill since 2014.
247. Dan McKinnon and Mr. McGuire gave similar evidence to Mr. Soldo as to why interim measures were not necessary on the Red Hill pending the resurfacing, considering the conclusions in the Tradewind Report and the 2014 Draft Golder Report.
248. Mr. McKinnon stated that based on the planned resurfacing and given his awareness of the variety of countermeasures that were implemented on the Red Hill, as detailed in the PW18008 January 2018 report to the PWC, he did not believe that the City needed to expend resources to implement additional measures on the Red Hill prior to the resurfacing.<sup>346</sup>
249. Mr. McGuire similarly observed that he understood that the resurfacing of the Red Hill was a significant remedial measure that would satisfy the recommendations in the Tradewind Report.<sup>347</sup> He further noted that given the winter season, he did not believe that any

---

<sup>345</sup> [Malone Transcript, September 23](#) at pg. 10826 – 10828, ll. 22 to 7.

<sup>346</sup> [Examination of Daniel McKinnon, dated October 14, 2022](#) [“**McKinnon Transcript, October 14**”] at pg. 13258 – 13261, ll. 14 to 19; [HAM0064308](#) at pg. 22, Exhibit 009a.

<sup>347</sup> [Evidence of Gord McGuire, dated October 20, 2022](#) [“**McGuire Transcript, October 20**”] at pg. 13798, ll. 7 to 23; [McGuire Transcript, October 24](#) at pg. 14159 – 14160, ll. 5 to 22.

pavement rehab measures were possible prior to resurfacing and that, in any event, he understood that a number of safety reviews and measures were implemented on the Red Hill since 2014.<sup>348</sup>

250. Mr. McGuire acknowledged that he was focused on the resurfacing of the Red Hill and that he understood Mr. Soldo and the Traffic Operations and Maintenance division to be looking after the safety of the Red Hill, as is their mandate.<sup>349</sup> In his evidence, Mr. Soldo confirmed that he had a discussion with Mr. McGuire regarding the friction values and its potential impact on road safety during which he would have advised Mr. McGuire of his view that the Tradewind Report and the 2014 Draft Golder Report did not raise any red flags with him.<sup>350</sup> The Inquiry received evidence from other City witnesses that similarly understood that interim measures on the Red Hill were considered and ultimately deemed unnecessary.<sup>351</sup>
251. For example, Fred Eisenberger, the City's Mayor from 2006 to 2022 (except for a period from 2010-2014), was clear in his evidence that, during his December 18, 2018 meeting, City staff and particularly Mr. McKinnon and Mr. Soldo advised him that although the Tradewind Report raised concerns because Council and the public had previously been provided with inconsistent information, it did not raise any immediate safety issues.<sup>352</sup>
252. Mayor Eisenberger further confirmed that City staff advised him that the road was safe based on their assessment of the collision data.<sup>353</sup> This is consistent with Mr. Soldo's evidence that the 2017 Annual Collision Report Presentation confirmed that the Red Hill was operating safely.

---

<sup>348</sup> [Examination of Gord McGuire, dated October 21, 2022](#) [**“McGuire Transcript, October 21”**] at pg. 13911 – 13912, ll. 10 to 10; 13954 – 13955, ll. 16 to 2.

<sup>349</sup> [McGuire Transcript, October 21](#) at pg. 13903, ll. 6 to 22.

<sup>350</sup> [Soldo Transcript, September 12](#) at pg. 10403, ll. 8 to 19.

<sup>351</sup> [Examination of Susan Jacob, dated September 6, 2022](#) at pg. 10225 – 10227, ll. 2 to 22; [Examination of Fred Eisenberger, dated October 12, 2022](#) [**“Eisenberger Transcript, October 12”**] at pg. 12724 to 12731, ll. 4 to 14.

<sup>352</sup> [Eisenberger Transcript, October 12](#) at pg. 12724 – 12731, ll. 4 to 14.

<sup>353</sup> [Eisenberger Transcript, October 12](#) at pg. 12725, ll. 18 to 15.

ii. **Legal Services did not interfere with Public Works' assessment of interim measures**

253. The Inquiry received evidence from several members of the City's Legal Services team with respect to the role of Legal Services in assessing whether interim measures were necessary on the Red Hill. The evidence is clear that:
- a. Legal Services understood that Public Works was responsible for assessing whether interim measures were necessary on the Red Hill, while Legal Services was focused on assessing the Tradewind Report from a liability perspective; and
  - b. Legal Services did not hinder Public Works' ability to assess the safety of the Red Hill.<sup>354</sup>
254. Nicole Auty, the City Solicitor in the relevant time, gave evidence regarding the role of Legal Service in dealing with the Tradewind Report. Ms. Auty's evidence was clear that Public Works staff were responsible for assessing the Tradewind Report and the 2014 Draft Golder Report with respect to the resurfacing and interim safety measures.<sup>355</sup> The City's Legal team, on the other hand, was concerned with any potential liability that arose from these reports.<sup>356</sup> This is consistent with the relative expertise of these groups.
255. Ms. Auty agreed that there was some overlap in these discussions, in that although Public Works Staff were satisfied that the Red Hill was operatively safely, Legal Services had ongoing discussions with Staff as to how to improve the safety performance of the road to strengthen the City's liability position:

In terms of safety measures, it was my expectation that if there were any or any concerns related to the safety of the roadway, that they [Public Works Staff] were dealing with those directly. And certainly at no point in time during any of the conversations that I had with the general manager, with either of the directors, did they indicate to me that there was any concerns about the roadway being unsafe. We did have subsequent conversations. I am particularly recalling December the 14th a discussion where we did speak about the countermeasures and the information that CIMA had provided around additional steps that could be taken to make the road more safe, and from my perspective those discussions were related to the potential for that to improve the City's position from

---

<sup>354</sup> [Examination of Nicole Auty, October 3, 2022](#) ["**Auty Transcript, October 3**"] at pg. 11376 – 11377, ll. 11 to 6.

<sup>355</sup> [Auty Transcript, October 3](#) at pg. 11411, ll. 6 to 11; pg. 11440, ll. 11 to 21; pg. 11485, ll. 7 to 17; pg. 1149, ll. 5 to 24.

<sup>356</sup> [Auty Transcript, October 3](#) at pg. 11411, ll. 6 to 11; pg. 11440, ll. 11 to 21; pg. 11485, ll. 7 to 17; pg. 1149, ll. 5 to 24.



liability in terms of undertaking those mitigation measures and that public works was dealing with them from the public safety side of things. So that's the conversations that I had with them about that.<sup>357</sup>

256. Ms. Auty was examined extensively on the scope of the retainer of Mr. David Boghosian, external counsel engaged by the City in December 2018 with respect to the Tradewind Report. There is some inconsistency in the evidence the Inquiry received regarding the exact scope of Mr. Boghosian's retainer, including whether Mr. Boghosian was retained in part to obtain information from CIMA regarding the impact of the Tradewind Report on CIMA's recommendations.<sup>358</sup>
257. Ms. Auty was clear in her evidence that Public Works staff had not indicated that they had any concerns with the safety of the roadway in the fall of 2018 or leading up to the CIMA February 4<sup>th</sup> Memo.<sup>359</sup>
258. When asked whether she believed that it was prudent to speak to Public Works about having a coordinated effort approach with CIMA, Ms. Auty confirmed that she understood that Public Works was assessing the safety of the Red Hill considering the information in the Tradewind Report and that they did not need to speak with CIMA in order to do this:

Q. You didn't think that it was important to talk to public works about having a coordinated approach with CIMA?

A. So I understood that our roles and our areas of expertise were different in that I was reviewing the liability side and providing Mr. Boghosian with the necessary information and providing him our understanding that he could speak to Mr. Malone about that issue. **I also understood that public works staff were addressing as their purview the issues around the safety of the roadway and the ongoing work that they were doing in that regard. We were coordinating our approaches in terms of bringing the information to council. That was ongoing and collaborative, but I understood that we were each conducting our own review and providing ultimately council with our expertise in the two different areas, mine being legal and liability review, and theirs being the public safety of the roadway.**

Q. But I take it CIMA, because they are a safety consultant, they could only give advice with respect to safety; is that fair?

A. So I believe it's fair in the context that that's the information they were providing to public works staff. **The reason that Mr. Boghosian was speaking to Mr. Malone was not to get a safety assessment but to have his technical expertise as an expert in the area of safety as to how -- so that Mr. Boghosian could appreciate and understand**

---

<sup>357</sup> [Auty Transcript, October 3](#) at pg. 11377 – 11378, ll. 16 to 12.

<sup>358</sup> The City understand that Commission Counsel intends to submit additional evidence on this issue on a future date.

<sup>359</sup> [Auty Transcript, October 3](#) at pg. 11377 – 11378, ll. 16 to 12.

**the liability. So I think those are two different aspects that particular consultants can provide.**

Q. Was it your understanding that public works was getting a safety opinion from CIMA having regard to the Tradewind results?

A. **So my understanding was that they were conducting their ongoing safety assessment and that that was their purview, that's what they were doing.** It was my role to look at the liability and legal implications of releasing the public -- of releasing the Tradewind report.<sup>360</sup>

259. Ms. Auty's evidence is consistent with the evidence from Public Works staff, including Mr. McKinnon, Mr. Soldo and Mr. McGuire.
260. Mr. Soldo was clear in his evidence that he was not advised by Legal Services, including Ms. Auty, that he was not permitted to communicate with CIMA about the Tradewind Report. In fact, Ms. Soldo confirmed that he understood that he could deal with CIMA as he saw necessary, irrespective of any dealings the Legal Services team may have had with CIMA under their purview.<sup>361</sup>
261. Mr. McKinnon similarly stated that he had no recollection of Public Works Staff, specifically Mr. Soldo or Mr. McGuire informing him that Legal Services was interfering with their ability to speak with CIMA with respect to the impact of the Tradewind Report on the safety of the roadway.
262. Mr. McKinnon further stated that he would not have permitted any interference with his staff's ability to speak to CIMA if they felt that was necessary to assess safety, and that he did not understand Legal Services to be doing that in this case:

Q. Okay. And what steps would you have taken if they advised that legal or Ms. Auty specifically prevented them from doing their job, which is to ensure the safety of the roadway? What steps would you have taken?

A. If Gord or Edward needed to speak to CIMA in relation to the safety of the road, I'd have called up CIMA myself and facilitated the phone call. I wouldn't be allowing anybody to prevent that. And not to inject nuance into that, but if Ms. Auty was trying to manage her consultant, I understand the flow of information and her wanting to be in control, but I would never interpret that to mean that we couldn't talk to CIMA if we had a safety concern. Absolutely not.<sup>362</sup>

---

<sup>360</sup> [Auty Transcript, October 3](#) at pg. 11493 – 11494, ll. 5 to 22.

<sup>361</sup> [Soldo Transcript, November 1](#) at pg. 15095 – 15096, ll. 6 to 2; pg. 15096, ll. 10 to 14.

<sup>362</sup> [McKinnon Transcript, October 14](#) at pg. 13262 – 13263, ll. 21 to 24.

263. The evidence indicates that in December 2018, Mr. McGuire emailed Justice MacNeil, at the time a solicitor in the City’s Legal Services group, to confirm whether he could speak with CIMA “confidentially”.<sup>363</sup>
264. Mr. McGuire was clear in his evidence that he wished to speak with CIMA to better understand whether the Tradewind Report would impact the resurfacing.<sup>364</sup> Specifically, Mr. McGuire testified he wanted to speak with Mr. Malone about whether he had seen anything in the roadside safety review that would impact the budget and if anything was coming forward from the capital programming for the resurfacing.<sup>365</sup> This is consistent with Mr. McGuire’s evidence that, as the Director of Traffic Operations and Maintenance, Mr. Soldo was responsible for the safety of the Red Hill while Mr. McGuire was responsible for the resurfacing as the Director of Engineering Services.<sup>366</sup>

***iii. CIMA Confirmed that Interim Measures were Not Necessary***

265. Mr. Soldo, Mr. McKinnon and Mr. McGuire’s evidence that interim measures were not necessary pending resurfacing was consistent with CIMA’s conclusions in the CIMA February 4<sup>th</sup> Memo.
266. In the CIMA February 4<sup>th</sup> Memo, CIMA was asked to confirm whether, in light of the information in the Tradewind Report or the 2014 Draft Golder Report, it would recommend any additional safety measures, recognizing that the Red Hill is scheduled to be resurfaced in the late Spring of 2019.<sup>367</sup> CIMA confirmed that, given the timing of the resurfacing and the improvements already implemented on the Red Hill since 2014 no additional measures were required:

It is our understanding that the City has initiated action to undertake replacement of the pavement surface on the RHVP. With an expectation that the new surface will continue to have friction levels that meet or exceed the friction parameters used in the geometric design of the road and that the new surface will have friction levels consistent with the LINC, the recommendations in our earlier reports regarding surface friction will have been addressed.

---

<sup>363</sup> [HAM0053949\\_0001](#), Exhibit 009a.

<sup>364</sup> [McGuire Transcript, October 21](#) at pg. 13936 – 13937, ll. 7 to 4.

<sup>365</sup> [McGuire Transcript, October 21](#) at pg. 13935, ll. 3 to 22.

<sup>366</sup> [McGuire Transcript, October 21](#) at pg. 13903, ll. 6 to 22.

<sup>367</sup> [HAM0054375](#) at pg. 3, Exhibit 009a.

The CIMA 2015 report included ten options that were recommended for consideration to improve safety on the RHVP. A number of those recommendations have been implemented and others are in progress or being further evaluated. Recognizing that repaving of the road is expected to occur in the late spring of 2019, we do not have any additional recommendations to add at this time.

One recommendation that may warrant a slight modification in the interim relates to speed enforcement. We had recommended 'regular' speed enforcement Modified wording, to one of 'increased' or 'enhanced' speed enforcement in an effort to ensure closer compliance with the posted speed, could be used.<sup>368</sup>

267. With respect to CIMA's note that it may have recommended enhanced speed enforcement measures on the Red Hill leading up to the resurfacing, the evidence indicates that the City had worked with Hamilton Police Service to launch a targeted enforcement campaign for speed, aggressive driving and distracted driving on the Red Hill.<sup>369</sup> In fact, the safety expert put forward by Commission Counsel noted that the enforcement campaign on the Red Hill was the largest he had seen in his career.<sup>370</sup>
268. During his examination, Mr. Malone was asked whether he considered the comments of his colleague Geoffrey Petzold, the Project Manager of Transportation at CIMA, that the City could interim chip seal or mill the pavement of the Red Hill in 2018 as well as the recommendation in the 2014 Draft Golder Report to consider micro-surfacing the Red Hill when completing the February 4<sup>th</sup> Memo.
269. In response, Mr. Malone stated that micro surfacing or chip sealing or milling the pavement were not necessary because these suggestions were looking at the roadway from a pavement condition lens while Mr. Malone was considering the matter from a road safety perspective.

Q. Mr. Petzold here says can't do much in the winter other than salt/sand but if they could do an interim chip seal or something maybe even mill the pavement so it has texture to it. I think your evidence was that you did not convey Mr. Petzold's suggestion to the City; is that right?

A. That's correct, I did not, but that would appear that they had that suggestion from Golder, is my point.

Q. Is that the reason that you didn't convey this information to the City?

---

<sup>368</sup> [HAM0054375](#) at pg. 2 – 3, Exhibit 009a; See also [Malone Transcript, October 31](#) at pg. 15013 – 15014, ll. 11 to 12.

<sup>369</sup> [HAM0012841](#) at pg. 2, Exhibit 010a.

<sup>370</sup> [Brownlee Transcript, February 21](#) at pg. 15798 – 15799, ll. 17 to 8.

A. No, I don't think explicitly that. I'm reviewing a different question, I'm not reviewing the pavement condition which is subject to the Golder report. I appreciate Mr. Petzold's input but I think he's got a lens which is similar to the Golder staff. I'm looking at it from a different perspective in terms of the road safety question.

Q. One of the questions that Mr. Boghosian puts to you is are there any additional safety measure you would recommend the City implement between now and when the road is resurfaced in late spring of 2019? And you viewed that question to be only related to safety measures not including the pavement surface; is that right?

A. Well, pavement design is not my expertise, so my perspective would have been context of remedial measures that are consistent with traffic engineering, traffic safety perspectives. We had made a number of those recommendations in the 2013 report, the 2015 report and the 2018 roadside safety assessment report. So speed limit signs, feedback signs, slippery when wet, enhanced enforcement, so on and so forth. That's the context that I was reviewing and contemplating providing input at this point.<sup>371</sup>

270. Mr. Malone's evidence in this regard is significant as it indicates that CIMA does not view pavement rehab measures, such as micro surfacing and pavement milling, as necessary from a safety perspective in this context and, as such, would not have recommended that the City undertake such measures.

### **PART THREE - CHANGES TO THE CITY'S POLICIES TO ENHANCE TRANSPARENCY, ACCOUNTABILITY, AND COLLABORATION**

271. Since the commencement of this Inquiry in 2019, the City has expended significant resources to review and revise existing policies and procedures and to implement new programs and initiatives developed at the City-wide and the Public Works levels to enhance transparency, accountability, collaboration, and quality improvement.

272. The Inquiry received evidence with respect to the improvements which are relevant to the work of the Inquiry from the affidavit of Janette Smith, dated February 22, 2023 ("**Smith Affidavit**"), and through a number of City witnesses, including Mr. McKinnon and Mr. Soldo. As detailed further below, these improvements were designed to achieve the following objectives:

- a. **Consistent and accessible document management systems:** Creating consistent record and document management practices, enhancing accountability and sharing of information across multiple divisions and departments, including through

---

<sup>371</sup> [Malone Transcript, October 31](#) at pg. 14 919 – 14920, ll. 1 to 14.

establishing tracking and retention policies for consultant and staff reports, ensuring continuity and transparency;

- b. **Consistent and transparent communication:** Ensuring effective communication between City staff, City Council and the public, including through identifying a clear process for the sharing of consultant reports which identify imminent risk to human health or safety with senior leaders and Council; and
- c. **Better coordination between groups for efficient project delivery:** Coordinating work across the City and various departments and divisions, including through improved project management processes, to provide leadership on the safe and efficient operation and maintenance of assets as well as address any fragmentation of the structures and systems involved by providing consistent coordination and oversight of roles and responsibilities, including within Public Works.

273. These objectives are consistent with the best practices identified by Ms. Baker in her Expert Report in respect of municipal governance, dated November 17, 2022 (“**Baker Report**”), as well as during her testimony before the Inquiry, regarding ensuring a culture of transparency and collaboration among City staff, leading to more clarity in roles and responsibilities assigned.

A. **Sharing of Consultant Reports with Identified Imminent Risks to Health or Human Safety**

274. Shortly after the commencement of the Inquiry, and as a function of the City’s commitment to process improvement, the City amended the City Code of Conduct to include Schedule G: Sharing of Consultant Reports with Identified Imminent Risks to Human Health or Safety (“**Mandatory Disclosure of Imminent Risks Policy**”). The Code of Conduct applies to all City employees and governs the manner in which employees perform their duties as it relates to local government administration and service to the community.<sup>372</sup>

---

<sup>372</sup> Affidavit of Janette Smith, dated February 22, 2023 [“**Smith Affidavit**”] at pg. 4, paras. 13-15; Exhibit E to the Smith Affidavit.

275. In accordance with the Mandatory Disclosure of Imminent Risks Policy, Public Works developed a comprehensive departmental policy that clearly details the steps staff must take when they receive a consultant report which identifies imminent risk to human health or safety entitled the Sharing of Consultant Reports with Identified Imminent Risks to Human Health or Safety (“**PW Sharing of Consultant Reports – Risk and Safety**”).<sup>373</sup>
276. Pursuant to PW Sharing of Consultant Reports – Risk and Safety, when advised of an imminent risk to human health or safety, in any report developed by a consultant, the following steps are required to be taken:
- a. Staff will follow up with the consultant to understand the risk and seek recommendations;
  - b. Staff will communicate the risk immediately to their supervisor/designate and Director;
  - c. The Director will communicate the risk and any recommendations to the General Manager;
  - d. The General Manager will share the information with the City Solicitor and the City Manager; and
  - e. The City Manager and the General Manager will communicate the risk to Council as appropriate and in a prompt manner.<sup>374</sup>
277. The expectation is for this policy to apply to all current and incoming consultant reports as well as any prior reports which Public Works Staff may become aware of.<sup>375</sup>
278. The PW Sharing of Consultant Reports – Risk and Safety is consistent with what Ms. Baker has identified as best practice in disclosing a consultant’s work to Council, specifically where the consultant’s findings or recommendations raise a real or possible safety issue.

---

<sup>373</sup> Exhibit E to the Smith Affidavit.

<sup>374</sup> Exhibit E to the Smith Affidavit.

<sup>375</sup> Smith Affidavit at pg. 7, para. 23.

279. In the Baker Report, Ms. Baker recognized that the responsibility for determining when or if a consultants' recommendations or report should go to Council or Committee rests with staff. Ms. Baker emphasized that the degree of transparency that would be required around the engagement of a consultant will depend on the origin, purpose, and nature of the consultant's assignment, expecting that where a consultant's recommendations include how public safety might be improved on a matter that has already received media scrutiny, City staff would disclose those recommendations to Council.<sup>376</sup>
280. In her testimony Ms. Baker confirmed that the PW Sharing of Consultant Reports – Risk and Safety is consistent with what she expects in terms of a process to facilitate escalating matters where a report advises of imminent risk to human health or safety, including the methods of communication that are suggested in the report for communicating any such escalations.<sup>377</sup>

**B. Council-Staff Relationship**

281. In 2021, the City implemented the Council-Staff Relationship Policy, which provides guidelines on the working relationship between members of Council and municipal staff.<sup>378</sup> One of the key principals of this policy is to ensure that Council and City staff are committed to accountability and transparency ensuring that “all Council members are provided with the same information on matters of general concern and/or matters that will be discussed at a meeting of Council or a committee of Council.”<sup>379</sup>
282. The policy also emphasizes the importance of Council and City staff recognizing their shared responsibility to serve the community and work together to build trust and confidence in City government and achieve the City's strategic priorities. Council and City staff will work to respect their roles and professional boundaries and follow appropriate processes, with Staff providing their professional opinion in good faith and Council not attempting to influence their professional opinion.<sup>380</sup>

---

<sup>376</sup> [Report of Janice Baker re: Municipal Governance, dated November 17, 2022](#) [“Baker Report”] at pg. 8 – 9.

<sup>377</sup> [Baker Transcript, February 22](#) at pg. 15934 – 15935, ll. 18 to 21.

<sup>378</sup> Exhibit F to the Smith Affidavit.

<sup>379</sup> Exhibit F to the Smith Affidavit.

<sup>380</sup> Exhibit F to the Smith Affidavit.



283. The Council-Staff Relationship Policy is consistent with what Ms. Baker identified as best practice with respect to sharing draft staff and/or consultant reports with individual councillors. The Baker Report provides that all members of Council and Committee should have equal access to and be provided material at the same time.<sup>381</sup> In her testimony, Ms. Baker confirmed that the Council-Staff Relationship Policy is consistent with and reflects the practices that she has implemented when working with municipalities dealing with council, and finds this policy to be consistent with common practice across most municipalities.<sup>382</sup>

**C. Public Works Quality Management System**

284. In 2019, as part of the City’s role in supporting and achieving its vision to be the best place in Canada to raise a child and age successfully, the City’s Public Works Department developed and implemented a comprehensive quality management system known as the Public Works Quality Management System (the “**PWQMS**”).<sup>383</sup>

285. The PWQMS is operated by the Public Works departmental leadership team, who has ownership and oversight of PWQMS, which includes prioritizing initiatives and program deliverables, to ensure that all aspects of operations, maintenance and capital renewal are undertaken in a manner that meets regulatory and corporate standards and seeks to continually improve and enhance outcomes.

286. To date, a number of foundational processes have been documented, implemented and monitored for the effective support and implementation of the PWQMS, including the three described below.<sup>384</sup>

***i. Document Control Procedure***

287. In 2021, a comprehensive Document Control Procedure was put into place across all divisions and sections of Public Works as part of the PWQMS. It applies to all documents that are managed within a controlled process to ensure that staff have access to the correct

---

<sup>381</sup> [Baker Expert Report](#) at pg. 19.

<sup>382</sup> [Baker Transcript, February 22](#) at pg. 15990 – 15991, ll. 19 to 24.

<sup>383</sup> Exhibit G to the Smith Affidavit.

<sup>384</sup> Smith Affidavit at pg. 7 – 8, paras. 27 to 29.

and latest version of the document including procedure manuals, policies, guidelines, checklists, forms, and templates.<sup>385</sup>

288. The Document Control Procedure also includes guidelines dealing with naming and numbering, version control and storage and management, ensuring that only the latest and approved documents are used by Public Works staff. This assists staff with locating and accessing internal and external documents relevant to their work, in the most suitable format.<sup>386</sup>

*ii. Control of Records Procedure*

289. The Control of Records Procedure applies to any Records across Public Works, which includes letters, documents, maps, drawings, emails and consultant reports. The Control of Records Procedure provides guidelines with respect to Record retention, disposal, collection, storage and access to ensure that Records are managed appropriately to facilitate the accessibility, accuracy and security of information to meet operational and legislative requirements.<sup>387</sup>

*iii. Project Management Manual*

290. In 2020, the Project Management Manual (the “**Manual**”) was put into place across Public Works.<sup>388</sup> The Manual clearly details the standard process and tools that must be used by Project Managers in Public Works to plan, deliver, and close projects. It outlines the project management process in a detailed how-to guide using five different process groups:

- a. Initiating – developing the project charter, identifying stakeholders & conducting the kick-off meeting;
- b. Planning – developing the Project Management Plan including the detailed plans for scope, schedule, cost, quality, resourcing, communication, risk, procurement and stakeholder management;

---

<sup>385</sup> Exhibit H to the Smith Affidavit.

<sup>386</sup> Exhibit H to the Smith Affidavit.

<sup>387</sup> Exhibit I to the Smith Affidavit.

<sup>388</sup> Exhibit J to the Smith Affidavit.

- c. Executing – directing and managing the project work and the project knowledge including quality, resourcing (including staff, consultants, contractors), communication, risk, procurement and stakeholder management;
  - d. Monitoring & Controlling – monitoring and controlling the project work, performing integrated change control including scope, schedule, costs, quality, resourcing, communication, risks, procurement and stakeholder management; and
  - e. Closing – closing the project or phase including procurement contracts, financial summary and council reports.<sup>389</sup>
291. By using the different process groups above, the Manual assists with creating a centralized project management system that fosters teamwork, accountability and communication across the board.
292. One of the key features of the Manual is the Project Charter. As part of the “Initiating” stage, Project Managers are required to create a Project Charter, which provides clear guidance and communication about who is accountable, what is expected to happen, and how success will be defined, serving as a work plan.<sup>390</sup> In her testimony, Ms. Baker confirmed that a Project Charter, consistent with the one in the Manual, is a key communications tool in dealing with project management.<sup>391</sup> It is necessary to ensure the scope, resources, responsibilities, and desired outcomes of a project are clearly articulated.<sup>392</sup>
293. The Manual facilitates a clear identification of roles and responsibilities to ensure that there is accountability for the completion of tasks amongst the members of a project team, particularly where team members sit across a number of section or divisions. This practice is consistent with the evidence Ms. Baker provided regarding the best practices at

---

<sup>389</sup> Exhibit J to the Smith Affidavit.

<sup>390</sup> Exhibit J to the Smith Affidavit.

<sup>391</sup> [Baker Transcript, February 22](#) at pg. 15908 – 15909, ll. 13 to 21.

<sup>392</sup> [Baker Expert Report](#) at pg. 5; [Baker Transcript, February 22](#) at pg. 15909, ll. 4 to 13.

municipalities to ensure that responsibilities are assigned and implemented between divisions in a transparent and collaborative manner.<sup>393</sup>

294. Finally, the Manual serves as a central project management tool. As discussed in the Baker Report, project managers and those who are responsible for reporting on the progress of projects, initiatives, and work orders can utilize the Manual both for tracking and reporting purpose, which further promotes transparency in roles and responsibilities to avoid silos.<sup>394</sup>

**D. Public Works – Red Hill Valley Parkway/Lincoln M. Alexander Parkway Operation and Maintenance Plan**

295. The Transportation Quality Management System (the “TQMS”) which is part of the broader PWQMS, is a framework designed to document processes, procedures, and responsibilities to maintain and operate the transportation system while meeting applicable legislative and regulatory requirements safely, effectively and efficiently.
296. An important part of the TQMS is the Public Works – Red Hill Valley Parkway/Lincoln M. Alexander Parkway Operation and Maintenance Plan (“**Parkway Maintenance Plan**”). The Parkway Maintenance Plan came into effect in March 2021 to assist staff with the delivery of the maintenance activities performed within the LINC and Red Hill (“**the Parkways**”) corridor. It also clearly identifies the division of tasks with respect to the operation and maintenance of the Parkways across the Public Works divisions and sections and formalizes the division of labour as it relates to the Parkways, specifically as between Engineering Services and Transportation, Operations and Maintenance. It also clearly outlines the driver for each maintenance activity, which has led to greater clarity and certainty around the maintenance of the Parkways.<sup>395</sup> As the “Process Owner” of the Parkway Maintenance Plan, the TQMS is responsible for the administrative aspects of implementing the Parkway Maintenance Plan.
297. In accordance with the Parkway Maintenance Plan, all necessary activities to maintain the Parkways are broken down into asset types with details of the maintenance activities and

---

<sup>393</sup> [Baker Expert Report](#) at pg. 2 – 3; [Baker Transcript, February 22](#) at pg. 15899 – 15903, ll. 1 to 3.

<sup>394</sup> [Baker Expert Report](#) at pg. 4.

<sup>395</sup> Exhibit M to the Smith Affidavit.

the driver of each activity clearly identified. Additionally, the specific divisions and sections responsible for the specific assets and asset activities are further explicitly identified in a related policy document entitled the PW Asset Responsibilities Within the Right-of-Way PW-P-026-002 (the “**Asset Responsibilities Policy**”), which applies to all divisions in Public Works who have assets.<sup>396</sup>

298. The Asset Responsibilities Policy addresses each asset/asset system within the City’s transportation system infrastructure. Responsibilities are defined for activities related to operations and maintenance, inspection for capital purposes, capital replacement, inventory control and monitoring requirements.<sup>397</sup>
299. The Parkway Maintenance Plan serves as another example of a tool, which as discussed in the Baker Report and in Ms. Baker’s testimony, can help different divisions within Public Works enhance their management and communication. It assists with having a clear sense of each division’s role and keeping track of goals and projects that need to be completed, by allowing team members to “keep a finger on the pulse of what’s happening.”<sup>398</sup>
300. Ultimately, the Parkway Maintenance Plan helps department leaders with what the Baker Report has deemed as a very important factor to organizational effectiveness: role clarity with no confusion or gaps in who is responsible for what. The Parkway Maintenance Plan achieves this by developing appropriate processes, that highlight accountability. In a large complex organization such as the City, the Parkway Maintenance Plan ensures that all roles are assigned, and that any interconnections, duplications and overlaps are reconciled, and negotiated creating proper structural cohesion.<sup>399</sup>

**E. Chief Roads Official**

301. In March 2021, the position of Chief Road Official (the “**CRO**”) was created as a senior leadership position at the Director level within Public Works for a period of up to 24-months to act as the “road authority” on an interim basis. The CRO position was intended

---

<sup>396</sup> Exhibit N to the Smith Affidavit.

<sup>397</sup> Exhibit N to the Smith Affidavit.

<sup>398</sup> [Baker Expert Report](#) at pg. 3 – 4; [Baker Transcript, February 22](#) at pg. 15903 – 15904, ll. 11 to 20.

<sup>399</sup> [Baker Expert Report](#) at pg. 3.

to address some fragmentation of the structure and systems involved in the design, build, operation and maintenance of city roads and to provide consistent coordination and oversight of Public Works roles and responsibilities with respect to city roads.<sup>400</sup>

302. Mr. Soldo was appointed as the CRO in June 2021. During his testimony, Mr. Soldo described the role and its focus on improving interaction and collaboration between various groups in Public Works, and ensuring clarity with respect to the roles and responsibilities assigned:

The entire role of the chief road official is to provide strategic leadership, to help coordinate not just between engineering and the TOM group now, but also any divisions that are delivering transportation services, including those that are in planning and economic development. So, as the chief road official, my job is to really ensure that all of our projects doesn't matter who is actually delivering them, ... meet council policies and procedures, are in line with our transportation master plan, ... this role is very much a coordinating leadership role to ensure that, we're meeting all our strategic objectives.

...

I don't lead the projects, but I'm there as the project sponsor and my role is to ensure that all the various departments, anyone who is involved in that project, that they have the right resources, that they have the right tools, and ensuring that we're meeting the objectives of the specific project.<sup>401</sup>

303. The CRO position was authorized by Council on a trial for 24 months, ending in June 2023. Public Works has been examining the future of this position with the intent to combine the duties of the CRO with the Director of Transportation Operations and Maintenance to allow for greater alignment of operational activities.<sup>402</sup>
304. The role of the CRO, independently or combined with the Director of Transportation Operations and Maintenance, is consistent with what the Baker Report outlines as best practice involving issues crossing division lines where there may be a conflict between divisions or the need to address safety issues, to designate a person most responsible to develop a project charter ensuring the scope, resources, responsibilities, and desired outcomes of a project are clearly articulated.<sup>403</sup>

---

<sup>400</sup> Exhibit B to the Smith Affidavit.

<sup>401</sup> [Soldo Transcript, September 12](#) at pg. 10361 – 10364, ll. 23 to 10.

<sup>402</sup> Smith Affidavit at pg. 18, para. 65, pg. 20, para. 70.

<sup>403</sup> [Baker Expert Report](#) at pg. 5.

**F. Parkway Management Committee**

305. The Parkway Management Committee (the “PMC”) was initially formed by Mr. McKinnon in 2017 under the name Parkway Coordination Committee, and formalized in 2019, under its current name.<sup>404</sup>
306. The purpose of this committee is to coordinate City staff’s work and to provide leadership on the safe and efficient operation and maintenance of the Parkways and to provide important guidelines for the functioning of the Parkways, including the mandate, scope of work, staff representation, reporting structure and meeting schedule.
307. During his testimony, Mr. McKinnon discussed the nature, evolution, and impetus of the PMC, stating that the committee was designed to ensure that an important City infrastructure such as the Parkways, involving so many different divisions was being managed effectively with proper ownership and coordination between various sections, ensuring that “nothing would fall through the cracks.”<sup>405</sup>
308. During Ms. Baker’s testimony, she confirmed that the structure and mandate of the PMC was consistent with what she would typically expect to see in a steering committee for a project such as the Red Hill.<sup>406</sup>

**G. Consultant Report Tracking and Retention Divisional Procedure**

**H. Guidance From Other Judicial Inquiries on Policy Recommendations and Findings of Misconduct**

311. A key component of the Terms of Reference is to identify recommendations to improve the policies and procedures at the City to prevent future incidents of non-disclosure of information to Council. The Terms of Reference also consider whether there was any negligence, malfeasance or misconduct in failing to provide the Tradewind Report, or the information and recommendations contained therein, to Council or the public.

---

<sup>404</sup> Exhibit S to the Smith Affidavit.

<sup>405</sup> [McKinnon Transcript, October 13](#) at pg. 13011 – 13013, ll. 11 to 17.

<sup>406</sup> [Baker Transcript, February 22](#) at pg. 15910 – 15912, ll. 24 to 2.

312. Prior inquiries and case law provide important guidelines and precedents that should be considered when responding to these issues in the Terms of Reference. A summary of these principles is provided below.

*i. **Guidelines on Findings of Misconduct***

*a. **The threshold for findings of misconduct is not perfection***

313. While the Commissioner may engage in findings of fact in order to answer the questions posed in the Terms of Reference, findings of individual misconduct go a step further. Misconduct is defined as a breach of or deviation from a normal standard of conduct. The question to be determined is not whether the actions of an individual actor were perfect, rather “whether the actions, conduct, or inaction of the person concerned fell short of a norm or standard that would have been followed by a reasonable person placed in comparable circumstances.”<sup>410</sup>

314. In the *Internal Inquiry into the Actions of Canadian Officials in Relation to Abdullah Almalki, Ahmad Abou-Elmaati and Muayyed Nureddin* (“**Canadian Officials Inquiry**”), Commissioner Iacobucci stated as follows regarding the threshold to be applied to the conduct of individual officials:

I am of the view that the actions of Canadian officials should be characterized as deficient only if they fell short of the norms that would have been followed by a reasonable person placed in comparable circumstances. Officials should not be expected to act with extraordinary or superhuman care, insight or skill...

Indeed, with the benefit of hindsight, it may be possible today to conclude that Canadian officials should have acted differently, but that would not be a sufficient basis on which to conclude that their actions were deficient.<sup>411</sup>

*b. **Findings of misconduct must be made on prevailing standards***

315. Actions must be assessed in relation to standards as they stood at the relevant time. Departmental practice or convention may provide appropriate standards, subject to not corresponding with deficient norms.<sup>412</sup> In the *Canadian Officials Inquiry*, Commissioner

---

<sup>410</sup> Simon Ruel, *The Law of Public Inquiries in Canada*, (Toronto: Thomson Reuters, 2010) at 143.

<sup>411</sup> The Honourable Frank Iacobucci, *Internal Inquiry into the Actions of Canadian Officials in Relation to Abdullah Almalki, Ahmad Abou-Elmaati and Muayyed Nureddin*, (Ottawa: Privy Council, 2008) at 342.

<sup>412</sup> The Honourable Frank Iacobucci, *Internal Inquiry into the Actions of Canadian Officials in Relation to Abdullah Almalki, Ahmad Abou-Elmaati and Muayyed Nureddin*, (Ottawa: Privy Council, 2008) at 341 - 2.



Iacobucci outlined the standards on which he could make findings that the actions of individual officials were deficient:

I intend to assess the actions of Canadian officials on the basis of an objective standard that may well be different from the established practices of the agencies involved. Nonetheless, this objective standard should be the one that would have been operative during the period of 2001 to 2004, when the relevant events occurred, and not a new standard developed with the benefit of hindsight.<sup>413</sup>

316. Additionally, in order for an individual to be held liable, that individual must know the standard that is being applied to their conduct, to determine whether the standard was breached.<sup>414</sup>
317. Based on these guidelines, it will be important to consider the evidence the Inquiry received regarding the changes made to the City's policies and procedures as part of the City's continuous improvement process when assessing the conduct of individual City staff.
318. By way of example, Traffic Operations and Engineering staff shared copies of the draft 2013 CIMA Report and attended a meeting with Councillors Jackson and Collins, whose wards touched on or included the Red Hill without sharing the draft report with all Councillors.<sup>415</sup> During their testimonies, Mr. Ferguson and Mr. Cooper, who attended the meeting with the two Councillors, stated that this practice was common in order to keep an open line of communication and provide Councillors with information impacting their wards.<sup>416</sup> Similarly, the two Councillors who attended the meeting with City staff about the report, mentioned their meeting to others in attendance during City staff's presentation to the PWC with great appreciation.<sup>417</sup>
319. When asked about this practice during his testimony, Mr. Lupton confirmed that this was a "common practice", noting that Public Works staff were encouraged to have general

---

<sup>413</sup> The Honourable Frank Iacobucci, *Internal Inquiry into the Actions of Canadian Officials in Relation to Abdullah Almaliki, Ahmad Abou-Elmaati and Muayyed Nureddin*, (Ottawa: Privy Council, 2008) at 341.

<sup>414</sup> *Stevens v Canada (Attorney General)*, 2004 FC 1746 at para 47.

<sup>415</sup> [HAM0004300\\_0001](#), [HAM0004301\\_0001](#), [HAM0004302\\_0001](#), [HAM0004303\\_0001](#), Exhibit 6.

<sup>416</sup> [Ferguson Transcript, August 11](#) at pg. 9596 – 9600, ll. 15 to 5; [Cooper Transcript, June 13](#) at pg. 5079 – 5082, ll. 21 to 1.

<sup>417</sup> [RHV0000986](#), Exhibit 076.

discussions with specific Councillors on issues that would particularly impact their wards.<sup>418</sup>

320. Councillor Jackson similarly confirmed that these types of “courtesy” meetings with City staff were held for informational purposes, in instances where a report would impact a specific geographical area in a Councillor’s ward.<sup>419</sup>

*c. Findings of individual misconduct should be made only when necessary*

321. Several judicial inquiries have emphasized that findings of misconduct should not be the principal focus and should only be made when necessary to carry out the mandate of the inquiry.<sup>420</sup> Similarly, the relevance and necessity of finding misconduct against individual City staff to the Terms of Reference of this Inquiry, should be evaluated in a proportional manner.<sup>421</sup>

322. For example, in the *Canadian Officials Inquiry*, Commissioner Iacobucci determined that it was neither necessary nor appropriate to make findings concerning the actions of any individual Canadian official, even if their conduct was deficient.<sup>422</sup> Commissioner Iacobucci further noted that even though the “actions of Canadian officials” were the focus of the terms of reference, the individuals were acting in the manner they did, on behalf of, and within the chain of command established by the institutions:

While, as I will explain in setting out my findings, I consider that some of the actions of some of these officials did not meet the standards to be expected of them, I saw no evidence that any of these officials were on a frolic of their own, or seeking to do anything other than carry out conscientiously the duties and responsibilities of the institution of which they were a part.<sup>423</sup>

---

<sup>418</sup> [Lupton Transcript, June 7](#) at pg. 4173 – 4174, ll. 11 to 8.

<sup>419</sup> [Examination of Tom Jackson, dated October 26, 2022](#) [“**Jackson Transcript, October 26**”] at pg. 14533 – 14534, ll. 17 to 6.

<sup>420</sup> *Canada (Attorney General) v Canada (Commission of Inquiry on the Blood System)*, [\[1997\] 3 SCR 440 at para 57](#). [Krever]

<sup>421</sup> Courts have rejected overtechnical or legalistic approaches to commissions of inquiry. In interpreting an inquiry’s terms of reference, normal rules of legal interpretation apply. As stated by the Supreme Court, “the words of an Act are to be read in their entire context and in their grammatical and ordinary sense.” See: Elmer Driedger, *Construction of Statutes*, 2nd ed (Toronto: Butterworths, 1983), cited in *Rizzo & Rizzo Shoes Ltd. (Re)*, [\[1998\] 1 SCR 27 at para 21](#).

<sup>422</sup> The Honourable Frank Iacobucci, [Internal Inquiry into the Actions of Canadian Officials in Relation to Abdullah Almalki, Ahmad Abou-Elmaati and Muayyed Nureddin](#), (Ottawa: Privy Council, 2008) at 345.

<sup>423</sup> The Honourable Frank Iacobucci, [Internal Inquiry into the Actions of Canadian Officials in Relation to Abdullah Almalki, Ahmad Abou-Elmaati and Muayyed Nureddin](#), (Ottawa: Privy Council, 2008) at 61.

323. The need for finding individual misconduct in the context of an inquiry that engages broader organizational factors such as this one, was also discussed by Commissioner Gillese in the *Public Inquiry into the Safety and Security of Residents in the Long-Term Care Homes System*. In her findings, Commissioner Gillese recognized that it is both “unfair” and “ineffective” to find personal misconduct against individuals, while pointing out that not finding individual misconduct does not necessarily mean that there have been no individual shortcomings, or that there are not actions that individual stakeholders could take to improve.<sup>424</sup>
324. In the *Bernardo Investigation Review*, Commissioner Campbell provided further guidance to commissioners in this regard, indicating that commissioners should avoid conclusions suggesting that the basic problem can be solved by identifying human error or unprofessional conduct. That may well be important, “but these problems do not go away simply because individuals have been implicated. These problems only go away when people change their systems, their attitudes, and the way that they do business.”<sup>425</sup>
325. Given the guidelines above, it is important to consider the necessity to label the acts of individual City staff acting in good faith in the performance of their duties as misconduct, particularly if the purpose of the Inquiry does not require it.

***ii. Guidelines on Policy Recommendations***

326. Any recommendations flowing from this Inquiry should reflect the various steps the City has already taken to evolve its policies and procedures.
327. As stated by Commissioner Bélanger in the *Elliot Lake Commission of Inquiry*, it is important to take a conservative and pragmatic approach in making recommendations arising out of public inquiries. Some guidelines to consider include: solutions must be cost effective; solutions must be practical; implementation must be reasonably achievable; and

---

<sup>424</sup> The Honourable Eileen E. Gillese, *Public Inquiry into the Safety and Security of Residents in the Long-Term Care Homes System*, Final Report (2019), vol 1 at 24.

<sup>425</sup> The Honourable Archie Campbell, *The Bernardo Investigation Review* (Toronto, 1996) at 402 as cited in Ed Ratushny, *The Conduct of Public Inquiries: Law, Policy, and Practice* (Irwin Law, 2009) at 385-6.

implementation must be likely to attract consensus, support, approbation from as broad a cross-section of society as possible.<sup>426</sup>

328. Continuous improvement is an underlying component of any municipality corporation, that involves a complex organizational structure, such as the City. As a large corporation, the City acknowledges the need to constantly adapt, evolve and improve.
329. Since the start of this Inquiry, the City has sought every opportunity to enhance its policies and structures to deliver improved value to the community and provide excellence in public service. These policy and procedural enhancements reflect the City's commitment to continuous quality improvement and the integration of best practices into its long-term corporate strategy to achieve its vision of being the best place in Canada to raise a child and age successfully.
330. The City looks forward to receiving the recommendations that flow from this Inquiry and remains committed to evolving its policies and practices, based on its existing strategic and management capabilities, to uphold the City's mission to provide high quality cost conscious public services that contribute to a healthy, safe and prosperous community, in a sustainable manner.

---

<sup>426</sup> The Honourable Paul R. Belanger, [\*Report of the Elliot Lake Commission of Inquiry\*](#), (Elliot Lake, 2014) at 612.



**Lenczner  
Slaght**

130 Adelaide St W  
Suite 2600  
Toronto, ON  
Canada M5H 3P5  
T 416-865-9500  
F 416-865-9010  
[www.litigate.com](http://www.litigate.com)

LENCZNER SLAGHT LLP