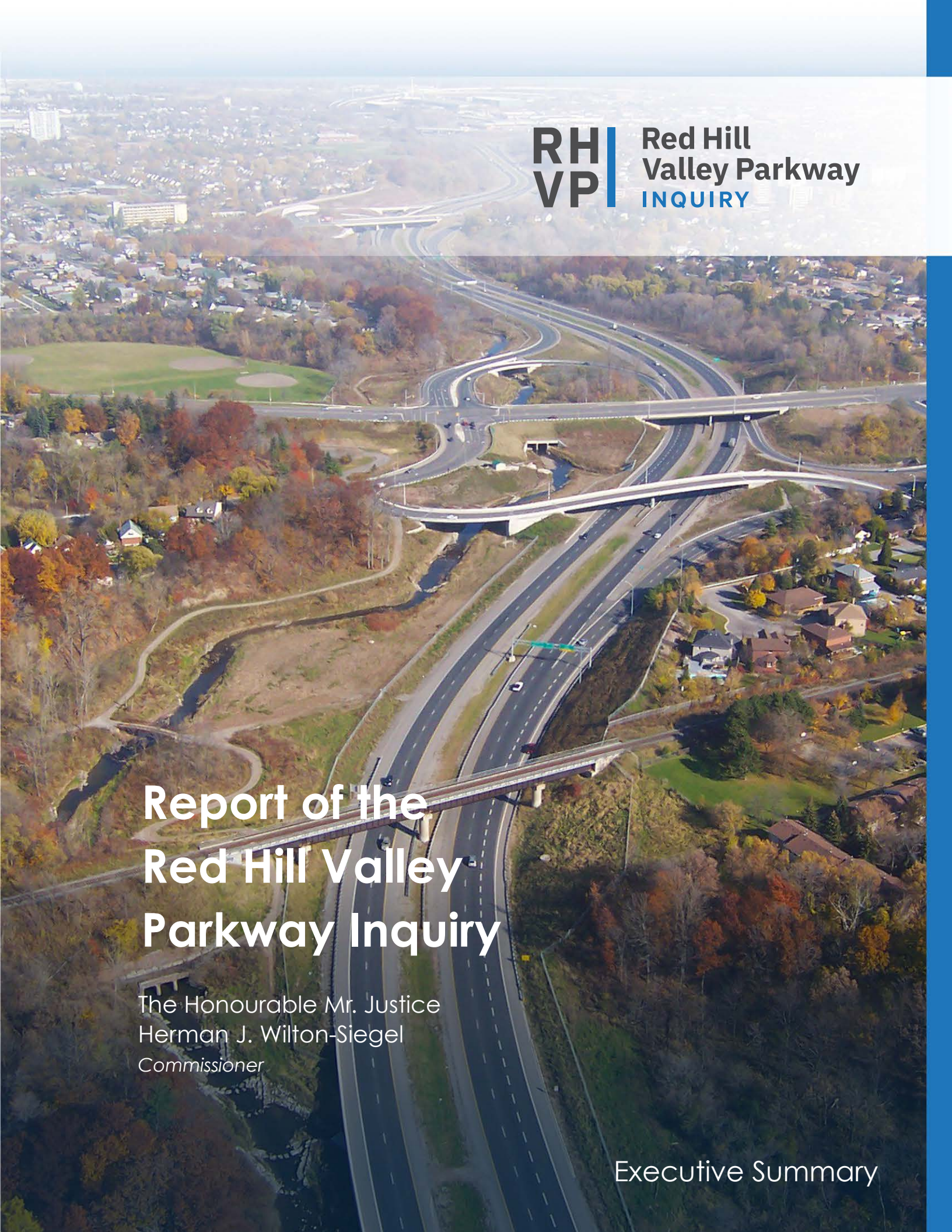

RH VP | Red Hill Valley Parkway INQUIRY

# Report of the Red Hill Valley Parkway Inquiry

The Honourable Mr. Justice
Herman J. Wilton-Siegel
*Commissioner*

Executive Summary

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## Executive Summary

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Red Hill Valley Parkway Inquiry Report consists of two volumes:

Volume 1: Executive Summary and Chapters 1 - 8

Volume 2: Chapters 9 - 13 and Appendices



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# Executive Summary

# Introduction

The Red Hill Valley Parkway (the "RHVP") is a municipal urban freeway that runs through the Red Hill Valley, part of the Niagara Escarpment. The RHVP connects at the south end to the Lincoln M. Alexander Parkway (the "LINC"). The RHVP and the LINC were designed, constructed, and are owned by the City of Hamilton (the "City"). The RHVP and the LINC remain the only freeway infrastructure projects built by the City; together they form an approximately 19 km continuous connection between Highway 403 and the Queen Elizabeth Way ("QEW"), which are provincial highways owned and operated by the Ontario Ministry of Transportation (the "MTO").

Almost as soon as the RHVP opened in 2007, City councillors began receiving complaints about driving conditions on the RHVP. These complaints related principally to an inability to see pavement markings and roadway delineators, particularly in the dark or during inclement or snowy weather conditions, and a lack of lighting on certain portions of the RHVP. Some complaints also raised the issue of potential or perceived slipperiness of the road surface. The RHVP had its first fatal collision in 2012, and its second in 2015. By 2018, seven people had died in collisions on the RHVP.

As early as 2013, councillors pressed for measures to investigate and improve the driving experience on the RHVP. This included multiple directions from the City's Public Works Committee ("PWC"), a standing committee of the Hamilton City Council ("Council"), and the retainer of CIMA+ ("CIMA"), a traffic safety consultant, on several occasions to prepare a safety review of the RHVP, including by conducting a collision analysis. CIMA's reviews consistently revealed, among other things, a high proportion of wet surface collisions and single motor vehicle collisions. Beginning in 2013, CIMA identified various countermeasures to reduce the number and severity of accidents on the RHVP including changes to pavement markings, reflectors and signage, enhanced lighting, installing median barriers, and conducting friction testing, among others.

Between 2013 and 2018, the City, through its traffic safety staff (the "Traffic group" or "Traffic"[1] within the Public Works department), implemented the changes to the pavement markings, reflectors, and signage CIMA had recommended. There was also a significant push from staff in the Traffic group and the Hamilton Police Service to curb speeding, which the Traffic group presented as a principal explanation for the collision experience on the RHVP. Public Works staff recommended the deferral of larger, more expensive countermeasures, including increased lighting on the RHVP and the installation of median barriers. Throughout the period from 2014 to 2019, there was increasing public and media attention on the collisions and fatalities on the RHVP, including questions about whether the RHVP's pavement surface was a contributing factor to collisions on the parkway and requests from the media about friction testing results.

In 2016, the Engineering Services division of the Public Works department, under the Director of Engineering Services, Gary Moore, decided to complete surface treatment rehabilitation of the RHVP. In 2017, the surface treatment rehabilitation shifted to a more intensive resurfacing of the RHVP. In late 2017 and into 2018, Engineering Services considered the feasibility of a resurfacing method referred to as hot in-place recycling ("HIR"), instead of a more traditional mill and overlay resurfacing (which involves milling the top asphalt layer and replacing it with new asphalt material). Engineering Services was still assessing the method that would be used for the resurfacing when Mr. Moore retired in May 2018. By August 2018, the resurfacing was anticipated for 2019.

With this history as a background, in January and February 2019, City staff advised Council that, in September 2018, Gord McGuire, the new Director of Engineering, had found two reports, one prepared in January 2014 by Tradewind Scientific Ltd. ("Tradewind" and the "Tradewind Report") and a second report from Golder Associates

[1] The "Traffic group" or "Traffic" refers to the Traffic Operations & Engineering group. As set out in greater detail in Chapter 4, from late 2012 or early 2013 until 2017, the Traffic group was a group within the Energy, Fleet & Traffic section of the Corporate Assets & Strategic Planning division of Public Works. In 2017, the Traffic group became a section in the Transportation division and in 2018, it was transferred to the Roads & Traffic division. In February 2019, the Traffic section was renamed Transportation Operations in the Transportation Operations & Maintenance division. For purposes of the Executive Summary, I refer to the Traffic Operations & Engineering group (and, on occasion, the supervisors of this group) as "Traffic", "Traffic staff", or the "Traffic group".

Ltd. (“Golder”), who had acted as the City’s Quality Assurance consultant for the RHVP paving, on the state of the RHVP after six years of operation (the “2014 Golder Report”) to which the Tradewind Report was appended. Mr. Moore commissioned both reports in 2013 and received them in 2014.

The Tradewind Report reported the results of testing of the friction levels on the LINC and the RHVP conducted in 2013. The Tradewind Report found that, while the average friction levels on the LINC were generally comparable to or above an investigatory standard used in the United Kingdom, the friction levels on the RHVP were generally below or well below that standard. The Tradewind Report also recommended that a more detailed investigation be conducted, and possible remediation be considered to enhance the surface texture and friction characteristics of the RHVP. The 2014 Golder Report stated that, although the friction levels in 2013 were higher than when friction had been measured in 2007 immediately after construction of the RHVP, Golder considered them to be relatively low. The 2014 Golder Report recommended treatment methods to fix cracking on the RHVP, which would also address the low friction levels.

Two considerations motivated City staff to notify Council of the Tradewind Report in January and February 2019. First, Mr. Moore had not provided the Tradewind Report or the 2014 Golder Report to anyone else in Public Works after his receipt of them in early 2014, despite requests for information about friction testing from City staff and from the media. Significantly, during his tenure, Mr. Moore had made comments and representations to Council, staff in Public Works, and the media about the friction levels on the RHVP and friction testing results which were inconsistent with and/or contradicted by the findings and recommendations in the Tradewind Report. Second, in November 2018, the City received a freedom of information (“FOI”) request seeking documents relating to friction testing and asphalt testing to which these reports would be responsive. This development immediately elevated the priority to advise Council of the Tradewind Report before it was released to the FOI requestor.

Council was advised of the Tradewind Report at a closed session on January 23, 2019, and received a more comprehensive briefing on February 6, 2019. At the meeting on February 6, 2019, Council directed staff to release the Tradewind Report to the public that evening, together with a public apology to Council and the public regarding the Tradewind Report and the manner and timing of its disclosure.

Shortly after the Tradewind Report was disclosed publicly, City staff learned that the MTO had conducted friction testing on the RHVP between 2008 and 2014, in addition to friction testing the MTO had completed in 2007. At the time the Tradewind Report was discovered and disclosed, City staff were unaware that the MTO had conducted friction testing on the RHVP between 2008 and 2014, or of the test results.

## The Inquiry Mandate

As a result of the disclosure to Council, Council initiated this Inquiry, established the Terms of Reference of the Inquiry consisting of 24 questions by a resolution passed on April 25, 2019,[2] and requested the appointment of a judge to conduct a judicial inquiry pursuant to section 274(1) of the *Municipal Act, 2001*.[3] I was subsequently appointed as the Commissioner of the Inquiry in May 2019.

Public inquiries serve a variety of important functions. As the name suggests, they are inquisitorial in nature, with a fact-finding mission, held in public, and run by an independent non-partisan commissioner. They aim to bring clarity about the precipitating event(s) to the entity that calls the inquiry, to the public, and in this case, to those who have been personally affected by accidents on the RHVP or who have questioned the safety of the RHVP for many years.

My mandate as Commissioner was strictly defined by the Inquiry's Terms of Reference and the questions that Council requested that I address. These questions can be distilled into five broad categories, which were undoubtedly in the minds of the public and City councillors when the Inquiry was called:

1) Why was the Tradewind Report not shared amongst City staff, Council, and the public prior to its discovery in the fall of 2018?

2) Were appropriate steps taken to disclose the Tradewind Report to Council and the public after its discovery in the fall of 2018?

[2] The full list of the questions set out in the Terms of Reference is contained in Appendix C.

[3] *Municipal Act, 2001*, SO 2001, c 25.

3) Why was the City not made aware of the prior friction testing of the RHVP conducted by the MTO in 2007?

4) What effect, if any, did the lack of awareness of the Tradewind Report and the MTO friction testing in 2007 on the part of City staff, Council, and the public, and the lack of prompt implementation of the recommendations contained in the Tradewind Report, have on the safety of the RHVP? Were drivers on the RHVP put at risk as a result of the non-disclosure? Did friction levels contribute to motor vehicle accidents on the RHVP, and what other factors, including driver behaviour, lighting, and weather conditions, contributed to such accidents?

5) What changes should the City make as a result of the answers to the questions above?

## The Inquiry Process

To answer the 24 questions set out in the Terms of Reference, the Inquiry proceeded in several phases: an investigation phase involving document gathering, interviews, and the preparation of extensive Overview Documents; a public hearings phase over 78 hearing days for Phase 1 (which focused on fact evidence) and six days for Phase 2 (which focused on governance and technical expert evidence); and the preparation of this Report. Four entities — the City, Golder, Dufferin Construction Company ("Dufferin"), and the MTO — had formal participation status, and I encouraged non-participants, including those affected by collisions on the RHVP, to be involved in other ways.

Some of the specific 24 questions — regarding who had knowledge of the Tradewind Report and the 2007 MTO friction testing and when, and what reports concerning the RHVP were commissioned over time — were relatively straightforward. However, the answers to most of the questions posed in the Terms of Reference were complex, involved a broad timeframe to consider, and necessitated significant factual evidence.

As set out below, the question of why the Tradewind Report was not disclosed to Council until 2019 was not simply the result of one person's actions but had much to do with a culture within Public Works that did not require collaboration among its divisions

in respect of traffic safety on the RHVP. The Inquiry therefore dealt with the conduct of particular individuals, and with issues of interpersonal dynamics, workplace culture, and systemic gaps regarding the division of responsibility within Public Works as it related to traffic safety on the RHVP, and between Public Works and Legal Services following the discovery of the Tradewind Report in 2018[4]. On these issues, the Inquiry benefitted from the expertise of Janice Baker[5] on issues regarding the best practices for the management and governance of municipalities.

In addition, the Inquiry was tasked with answering questions of a highly technical nature regarding the construction of highways, traffic safety principles, and the role of friction as a potential contributor to accidents. These questions required a basic understanding of the science of pavement friction and friction measurement, traffic safety practices, the design and construction of the RHVP, and the recommendations of the City's consultants and the actions taken by Public Works staff between 2013 and 2018 to address the emerging collision patterns on the RHVP and pavement-related issues. In this regard, the Inquiry benefitted from the technical assistance of the experts retained by the Inquiry, Dr. Gerardo Flintsch[6] and Russell Brownlee,[7] and the experts of the participants, David Hein,[8] Dewan Karim,[9] and Dr. Hassan Baaj.[10] In addition, the Inquiry heard from several current or former CIMA staff as fact witnesses, regarding their involvement in a number of RHVP-related consulting reports for the City.

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[4] A complete list of the individuals referenced in the Inquiry is contained at Appendix P.

[5] At the time of her opinion, Ms. Baker was the Chief Administrative Officer for the Region of Peel.

[6] Dr. Flintsch is the Director of the Center for Sustainable and Resilient Infrastructure at Virginia Tech Transportation Institute and the Dan Pletta Professor of Engineering in the Via Department of Civil and Environmental Engineering at Virginia Polytechnic Institute and State University.

[7] Mr. Brownlee is the President and Transportation Safety Engineer at True North Safety Group.

[8] Mr. Hein is the President and Principal Engineer at 2737493 Ontario Limited, and the City's expert in the Inquiry.

[9] Mr. Karim is the Practice Lead of the Transportation Engineering & Safety Group at 30 Forensic Engineering, and the City's expert in the Inquiry.

[10] Dr. Baaj is the Director of the University of Waterloo's Centre for Pavement & Transportation Technology, and Golder's expert in the Inquiry.

The Inquiry had the benefit of hindsight, and the experts who appeared before it had years of data to ground their opinions and analysis. Some information and technical findings were a product of the Inquiry's processes; City staff and consultants did not have this information prior to 2019. Although I relied on these experts to assist me in forming my conclusions below and in this Report, I have attempted to avoid imposing the expertise of the technical experts on individual members of the Public Works department where it was not warranted or importing hindsight knowledge onto those who had responsibility for the safety of the RHVP over time.

A judicial inquiry cannot make findings of civil or criminal liability, nor conclusions that any individual has breached any legal standard that would entail civil or criminal liability or professional discipline. Determining conclusions of civil or criminal liability is a matter for the courts in the context of specific civil or criminal proceedings. For this reason, I have not determined whether any conduct constitutes "negligence", as posed in two of the questions in the Terms of Reference, which would require conclusions in law. Similarly, to the extent "malfeasance" involves a legal conclusion, I have not addressed that term. Where terms such as "responsible", "failure", or "standards" are used in this Report, I intend their plain non-legal meaning rather than to give these words the meaning they would have in a civil or criminal proceeding or to imply any conclusions in law. As Justice Bélanger aptly stated in the *Report of the Elliot Lake Commission of Inquiry*, an inquiry's "dissection and analysis of past events, its quest for expert opinion, and its examination of best practices have only one purpose: to put forward an opinion, in the form of recommendations, on how best to improve the current situation."[11]

## The Content of the Report

To answer the questions set out in the Terms of Reference, this Report is necessarily lengthy and detailed. This Executive Summary does not capture all of the findings contained within my Report, much less all of the evidence behind those findings, nor the totality and nuances of my conclusions or rationale for my recommendations, which are both set out in Chapter 12. I encourage readers to review the full report, which is organized as follows.

[11] *Report of the Elliot Lake Commission of Inquiry*, *Executive Summary* (Queen's Printer for Ontario: Ministry of the Attorney General, 2014) (Paul R. Bélanger) at 4.

The first four chapters set out important background information. Chapter 1 sets out a basic introduction to a number of technical topics, including the surface course used on the RHVP, the science of pavement-tire friction and how it is measured on highways in Ontario including by the MTO, and certain traffic safety concepts and highway design considerations relevant to traffic safety on the RHVP. This was necessary given the breadth of the Terms of Reference regarding the factors that cause collisions. Chapter 2 addresses the design and construction of the RHVP and provides an overview of the design and geometric features on the RHVP mainline that are significant for traffic safety purposes. Chapter 3 describes the friction testing that the MTO conducted on the RHVP in 2007 and between 2008 and 2014. Chapter 4 provides an overview of the City's governance structure and operational organization, with particular attention to the departments, divisions, sections, and key staff thereof, and external consultants retained by the City, who had a role in managing and maintaining the RHVP or who were otherwise the subject of this Inquiry's mandate.

Chapters 5 through 10 review, in chronological order, the actions taken by City staff, principally members of the Traffic group and the Engineering Services division regarding RHVP-related matters, including Public Works' retainers of Golder to assess the pavement condition and of CIMA to address traffic safety, and discussions regarding rehabilitation and resurfacing of the RHVP. Chapters 9 and 10 also describe the circumstances under which Mr. McGuire found the Tradewind Report. Chapter 11 describes the actions of staff from Public Works, Legal Services, and Communications to bring the Tradewind Report and other RHVP-related matters to Council in January and February 2019.

Chapter 12 sets out certain findings and my overall conclusions relevant for the Terms of Reference and the Recommendations. It then sets out my answers to the specific questions posed in the Terms of Reference and is followed by my Recommendations. Chapter 13 concludes the Report with an overview of the Inquiry process.

# Significant Findings and Conclusions of the Report

The following findings and observations are important for understanding the City's approach to traffic safety on the RHVP, particularly from 2013 to 2019. They also inform the answers to the Terms of Reference and the Recommendations that are set out in Chapter 12.

## Design of the RHVP[12]

There are no mandatory requirements for the design and construction of limited access municipal freeways in Ontario. There are instead guidelines and best practices, and requirements that municipalities can adopt if they choose to do so. The applicable design manuals provide the starting points of any design, but there is always latitude to deviate from the guidance in specific situations and combinations of situations. In some cases, it may also be necessary to depart from a particular guideline in order to meet other project objectives and constraints.

Compliance with the prevailing design standards does not ensure that a roadway will be safe. Nor does the need to apply exceptions to those standards imply that a roadway will be unsafe. The safety of a highway must be monitored and assessed on a continuous basis with its collision experience measured over a long enough time period to provide a high level of confidence that the observed collision experience is a true representation of the expected safety characteristics of that location or highway. As addressed below this is the concept of a "substantive safety" approach, as distinct from a "nominal safety" approach, which simply assesses compliance with minimum standards and/or guidelines. The substantive or long term safety performance of a roadway does not always directly correspond to its level of nominal safety, even if all geometric design criteria are met.

The RHVP was designed to follow the contours of the Red Hill Valley and constructed to accommodate the existing arterial roads crossing the Red Hill Valley. The RHVP

[12] The design and construction of the RHVP, its challenging geometry, and the impact on traffic safety are described in Chapters 1, 2, and 12.

was designed and constructed in accordance with prevailing design guidelines in Ontario (with one qualification regarding a feature of one curve that it is not possible to assess, and with certain permitted design exceptions described below). However, the design of the RHVP has features that make some sections particularly challenging to drive. These include:

- The RHVP design speed is 100 km/h and, until 2019, the entire RHVP mainline had a posted speed limit of 90 km/h. Both of these speeds were within the permissible range of the design guidelines, but the 10 km/h differential between them was less than the desirable 20 km/h difference recommended by the design guidelines.

- There are three sequential curves in the section between the Greenhill Avenue and Queenston Road interchanges, two of which are at or close to the minimum curve radii permitted under the design guidelines.

- The design guidelines permit deviations from the recommended interchange spacing, which is not uncommon with urban freeways due to existing arterial roads. In this regard, the spacing of all but one of the six RHVP interchanges, including between the Greenhill Avenue, King Street, and Queenston Road interchanges, reflects the application of such exceptions.

- Similarly, three of the “weaving distances” on the RHVP (the spacing between on ramps and off ramps) are below the recommended minimum in the design guidelines and correspond with the two most closely spaced interchanges and the three sequential curves between the Greenhill Avenue and Queenston Road interchanges described above.

- The RHVP has non-continuous decision point lighting, which is located at the exit ramp of each interchange. Accordingly, each RHVP exit ramp and their surrounding area(s) are lit, but ramps entering onto the RHVP and the RHVP mainline itself are not lit. The RHVP’s lighting configuration is identical to the LINC’s.

In summary, the section from Greenhill Avenue to Queenston Road brings together closely spaced interchanges and weaving sections in succession with tight curves

that motorists need to navigate and, prior to the speed reduction, an atypical but permissible difference between the posted and design speeds. Individually and collectively, these elements of the RHVP design may result in what are known as "expectancy violations" for some drivers leading to poor decision making. There is a correlatively higher friction demand required for execution of maneuvers in that area.

## Construction of the RHVP

Two features of the RHVP's pavement were innovative in a municipal context. Both were relevant to the Inquiry's mandate.

First, the RHVP was constructed using a perpetual pavement structure, which is intended to last longer than traditional pavement structures. The choice of a perpetual pavement structure was a reasonable one.

Second, the RHVP surface was paved with a stone mastic asphalt ("SMA") layer which differed from more traditional surface courses. Gary Moore, then working within the Red Hill Valley Project Office, and the City's Quality Assurance consultant, Golder, and Mr. Moore's primary contact at Golder, Dr. Ludomir Uzarowski, were involved in the selection and assessment of the RHVP SMA during design and construction.

The paving contractor, Dufferin, sourced the coarse and fine aggregate used in the SMA surface course from the quarry of its affiliate, Demix Agrégats, located just outside of Montreal, Quebec. This was the first time the Demix aggregate had been used in Ontario. The MTO requires aggregates used in the construction of roads to be tested and pre-qualified for their frictional qualities before use in provincial highways. Prior to the RHVP's construction, the Demix aggregate was not on the MTO's Designated Sources for Materials list of pre-qualified aggregates. However, based on the testing information pertaining to this aggregate, the Demix aggregate was expected to provide a good frictional performance and was suitable for use in the SMA surface course of the RHVP.

The Inquiry did not receive any evidence that indicated that the frictional or other characteristics of the Demix aggregate were inadequate at the time of construction of the RHVP. In addition, although there were some construction deficiencies disclosed

by the various asphalt test results taken at the time of paving relating to the mix design, compaction, and gradation, the evidence established that these were unlikely to have adversely affected the frictional qualities of the RHVP. The use of SMA, in itself, did not give rise to any friction issues on the RHVP.

## A Comparison of the MTO and City Approaches[13]

Traffic safety is one of the highest responsibilities of a traffic authority, municipal or otherwise. Before the mid-1990s, a "nominal safety" approach, described above, assumed that a "road designed to meet minimum standards would be 'safe'." This is no longer an acceptable road safety assumption within the traffic safety community. Traffic safety on an urban expressway is not determined solely by compliance with the design standards and guidance in effect at the time of design of that expressway.

Rather, traffic safety requires a "substantive safety" approach. Even a roadway that is nominally safe (that is, all design elements meet design criteria) is not automatically substantively safe or vice versa. Despite complying with geometric design guidelines or standards, specific sections of a highway could still experience higher collision volumes due to various local constraints or conditions that were not included in the typical condition or geometric design details developed in industry documents. It is necessary to monitor traffic safety on an ongoing basis as usage on an expressway is a dynamic factor changing over time. A comprehensive traffic safety approach requires ongoing data collection and analysis and routine consideration of all factors that may contribute to collisions on a roadway to assess and reduce collisions. These factors include highway geometry, the location of interchanges and ramps, driver expectations, design and posted speeds, illumination, signage and roadside devices, pavement markings and other retroreflective safety devices, and the physical structure of the roadway, including the pavement structure, design, and materials.

The Inquiry heard evidence about the MTO's approach to assessing collision issues on provincial roads and to identifying when friction could be involved as a contributing factor. This evidence was instructive. As noted above, the MTO requires that the aggregate used in the construction of MTO roads be pre-qualified for its frictional

[13] The MTO's approach is set out in Chapter 1 and referenced in Chapter 12. Traffic safety principles are set out in Chapter 1 and both approaches are referenced in Chapter 12.

qualities, that is, tested before inclusion on the MTO list of Designated Sources for Materials. In addition, and more importantly for the purposes of this Inquiry, the regional offices of the MTO regularly monitor accident statistics to identify issues such as abnormal collision experiences in the provincial road system. They then conduct a detailed investigation to isolate the potential contributing factors to any such experience, which may include friction testing. Based on this investigation, the MTO then determines whether to apply countermeasures that respond to the identified contributing factors.

The City's approach to traffic safety on the RHVP during the relevant period for the Inquiry, being 2008 to 2019, did not follow the MTO's proactive approach. Instead, it was primarily reactive. Between 2011 and 2017, the City did not have a regularized system for analyzing collisions and identifying potential contributing factors to accidents in high collision areas on a comprehensive basis. Rather than proactively identifying areas of concern, traffic safety on the RHVP was generally addressed as an *ad hoc* response to particular issues raised by Council, the PWC, or public complaints.

Moreover, there does not appear to have been an understanding within Public Works that traffic safety was a shared responsibility of several divisions of Public Works. Although Gerry Davis, the General Manager of Public Works until the spring of 2016, testified that Public Works practised cooperation and collaboration between the divisions during his tenure, the evidence indicated otherwise in respect of the approach to traffic safety on the RHVP. The absence of a sense of a shared responsibility and a comprehensive approach to traffic safety presented itself in two related ways.

First, there was no Public Works division, staff, or director responsible for the overall safety of the RHVP, and this continued over the course of various organizational changes within Public Works. The responsibility for maintenance, operation, and traffic safety on the RHVP was allocated amongst divisions, sections, or groups within Public Works, with clear "siloed" delineation. Engineering Services was generally responsible for the physical roadway, which included the pavement surface except roadside structures, its Street Lighting & Electrical group was responsible for illumination, and its Asset Management section was responsible for assessing road infrastructure. The Roads & Maintenance division was responsible for more routine maintenance of the parkway. Traffic safety — principally matters that affected driver

behaviour such as pavement markings, signage, and posted speed limits, rather than the physical structure of the roadway — was the responsibility of the Traffic group, which fell under a different division. The Traffic group was required to assume responsibility for matters beyond the usual expertise and experience of those with traffic safety responsibility for the local roads and arterial roadways of the City. Traffic did, however, engage an external consultant, CIMA, to complete various traffic safety reports.

In order for a municipality to function and appropriately manage a major infrastructure asset, there needs to be an allocation of responsibilities amongst divisions and staff who have the requisite expertise. The City's allocation within Public Works for the RHVP and LINC reflected a delineation of responsibility in roadway infrastructure between the physical structure of the roadway and the traffic safety elements that principally affect driver behaviour that is, in part, structural. There is a division of skills, training, and expertise in traffic safety and in pavement materials, including within the consultant community. Generally speaking, for matters pertaining to surface friction, while traffic safety experts are aware that low friction can in some circumstances present a safety issue, they do not have a deep understanding of the science of friction or of how to interpret friction test results. Also generally speaking, if pavement and materials experts (who specialize in asphalt mixes, aggregates, and pavement design), like Golder, are conversant in friction testing and the interpretation of friction testing results, they do not necessarily know how to apply those results to the traffic safety context.

Second, and related to the first, the Traffic group and the Engineering Services division each viewed themselves as responsible only for the specific matters within their own areas of allocated responsibility. While a division of responsibilities may be appropriate for other arterial roads and residential streets, it is not effective for an urban expressway, especially in the absence of an individual who was designated to address issues of collective responsibility where there was a lack of information sharing between divisions.

The absence of a sense of a shared responsibility and of a comprehensive approach to traffic safety was further constrained by the approach of Mr. Moore to traffic safety on the RHVP. During his tenure as Director of Engineering Services, Mr. Moore did

not view traffic safety as being included within the mandate of Engineering Services. In addition, having been directly involved in the design and construction of the RHVP, Mr. Moore had the strongly held view that the RHVP was at least as safe as any comparable roadway because it had been designed according to the prevailing design standards using a quality aggregate and a premium surface course. In his view, any abnormal accident experience was attributable to driver behaviour, especially excessive speeding. Thus, from his perspective, there was no need for significant changes to the RHVP to respond to traffic safety concerns, especially in respect of the pavement, illumination, or other changes that would fall to Engineering Services to investigate, program, or implement. Indeed, he believed that doing so could have liability consequences for the City. Mr. Moore expressed these views, aggressively at times, to staff in the Traffic group in respect of friction testing, including challenging the utility or need for traffic safety countermeasures relating to friction testing, median barriers, and changes to lighting.

## Friction and Friction Standards (Answers to Terms of Reference Questions 22 and 23)[14]

It is important not to place inordinate emphasis on friction as a potential contributing factor to accidents on the RHVP. However, an understanding of friction demand and its possible contribution to collisions is necessary for the purposes of this Report, as the Inquiry was triggered by the disclosure of the Tradewind Report which dealt specifically with friction levels on the RHVP.

The friction level and texture of a pavement surface are important components of the highway-related conditions that influence traffic safety. Deficient friction is seldom the main cause of a collision, but low friction levels can be a contributing factor in the presence of other contributing circumstances in particular situations. Studies over the years have repeatedly shown that sites with low friction have more collisions than sites with high friction. Recent studies have found that both dry and wet collision rates increase with decreasing friction levels, though the impact is higher on wet road collisions than on dry road collisions.

[14] See Chapter 1 for more information on friction standards and the relationship to traffic safety.

What constitutes adequate friction in practice varies from roadway to roadway and from section to section within an individual roadway. Whether a road has adequate friction (skid resistance) and whether friction levels contribute to collisions are therefore questions to which there are no simple answers. In broad terms, an effective approach to ensuring adequate pavement friction requires policies and practices in the design and construction of a highway, a management program involving the monitoring of the collision experience of the highway, and a policy to identify and respond to potentially unsafe roadway surfaces in a timely fashion if low friction is determined to be a contributing factor to the collision experience.

Questions 22 and 23 of the Terms of Reference ask specifically about roadway friction standards in Ontario and their public availability.[15] There is no formal standard for acceptable levels of friction on a roadway in Ontario. The MTO does not publish any friction measurement standards or friction level investigatory limits in respect of highways in Ontario. The MTO also does not broadly share its friction data externally as a rule, although on occasion MTO friction data may be published or shared in technical papers and industry presentations. While there is no formal MTO directive governing responses to friction-related inquiries, in practice MTO staff appear to have limited their responses to generic, high-level information, avoiding the provision of specific information regarding friction results on specific MTO highways, any MTO views regarding appropriate threshold levels, and any interpretation of friction results.

The MTO locked-wheel friction testing generates friction levels referred to as friction numbers ("FN") on a scale of 100. There are other devices to test friction which use different measurement scales, including the GripTester which was used by Tradewind when it conducted its testing in 2013.

[15] Questions 22 and 23 ask: ***22)*** *What is the standard in Ontario, if any, with respect to the acceptable levels of friction on a roadway?* ***23)*** *Is information with respect to the friction levels of the roadways in Ontario publicly available?* See Chapter 1 for a further explanation of the MTO's uses of FN30, and Chapter 12 for a complete answer to Questions 22 and 23.

When testing is conducted for the purposes of qualifying an aggregate for the MTO's Designated Sources for Materials list, the MTO uses a guideline of FN30 as a performance measure for the aggregate under review. Aggregates used in pavements with friction results of FN30 or above are generally considered satisfactory for initial and continued listing on the MTO's list, provided the aggregates also satisfy all of the other requirements. However, in this context, the MTO does not look at friction demand issues that might render otherwise acceptable friction levels insufficient for the demand in certain locations. It looks only to the overall average FN of the segment tested or, in some cases, the results for a comparator control strip, in which event, it is the relative rather than the absolute result that is meaningful.

For traffic safety purposes, where an MTO regional office has requested friction testing after conducting an investigation to isolate the potential contributing factors to abnormal collision experiences, the MTO uses a tested friction level of FN30 (measured at the posted speed) as an informal investigatory level guideline for assessing roadway friction based on testing using its locked-wheel trailer testing equipment.

FN30 is used as a starting point for MTO staff to determine whether the friction demand required of the roadway is met and/or whether any friction-related issues exist and, in that context, whether surface friction conditions are a possible contributing factor to the collision experience being analyzed. It is not regarded as an indication, in itself, of either a safe road if a friction level exceeds the threshold or an unsafe road if a friction level falls below the threshold. Depending on the presence or absence of other possible contributing factors, a friction level above FN30 may be inadequate and conversely a friction level below FN30 may be sufficient.

While this guideline is not published, the MTO's use of this informal guideline was not a secret within the asphalt or paving industries in Ontario, although it was not universally known during the relevant period for the Inquiry. While Dr. Uzarowski of Golder was aware of the MTO's use of this guideline, witnesses for the City and Dufferin, who are part of that community, testified that it was not known to them.

# MTO Friction Testing of the RHVP (Answers to Terms of Reference Questions 17, 18, 19, 20, and 21)[16]

Questions 17 to 21 of the Terms of Reference ask about the circumstances and consequences of the non-disclosure of the friction testing which the MTO conducted on the RHVP in 2007.[17]

The MTO completed friction testing on a 4 km section of the southbound lanes of the RHVP on October 16, 2007, shortly before the RHVP opened to the public, on November 17, 2007. The 2007 testing was performed with the City's knowledge and agreement. Dr. Uzarowski requested it on behalf of the City to confirm the acceptability of the Demix aggregate used in the RHVP SMA surface course. The MTO was also interested in determining whether the RHVP SMA revealed any early age low friction issues, which the MTO had seen with its own SMA pavements, in which new SMA pavement exhibited low friction levels which improved over a relatively short period as traffic wore off an asphalt film on the surface.

The October 2007 test results obtained on the RHVP were better than typically achieved on MTO highways for brand new SMA pavements and were therefore considered acceptable by the MTO, particularly as the friction levels were expected to increase with traffic (results for Southbound Lane 1 averaged FN33.9, and ranged from FN28.1 to FN36.5; results for Southbound Lane 2 averaged FN33.8, and ranged from FN28.4 to FN37.4). Over time, several MTO staff received a copy of these results. The MTO provided the results to Golder who in turn provided them to Mr. Moore and Marco Oddi (then the Senior Project Manager, Red Hill Valley Project, Public Works,

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[16] The MTO's friction testing of the RHVP is addressed in Chapter 3.

[17] Questions 17 to 21 ask: ***17)*** *Why was the MTO Report not provided to Council or made publicly available?* ***18)*** *Who was briefed within the MTO's office about the MTO Report?* ***19)*** *Did the MTO Report contain findings or information that would have triggered Council to make safety changes to the roads or order further studies?* ***20)*** *Did the failure to disclose the MTO Report, or the information and recommendations contained therein, contribute to accidents, injuries or fatalities on the RHVP since January, 2014?* ***21)*** *Did the MTO request, direct or conduct any friction tests, asphalt assessments, or general road safety reviews or assessments on the RHVP other than the MTO Report?* See Chapter 12 for the answers to these questions.

Hamilton). Mr. Moore expressed his understanding of the results as indicating that the RHVP was “good to go”.

Mr. Moore made an operational decision not to share the 2007 results with anyone within Public Works. At the time he received the results, the RHVP project was near completion and with Chris Murray (former Director, Red Hill Valley Project, Public Works, Hamilton) having changed jobs, there was no director of the Red Hill Valley Project to provide the information to. Having received satisfactory results for newly placed SMA pavement that disclosed no issues, there was nothing to report to Council. Mr. Moore’s decision not to share the results was not inappropriate in the circumstances.

Even if the 2007 friction test results had been provided to Council in 2007, they would not have triggered any safety changes to the RHVP or prompted any further friction-related studies of the parkway, and the lack of such disclosure did not contribute to accidents, injuries, or fatalities on the RHVP. The uncontroverted evidence before the Inquiry was that no further assessment, remediation, or action was warranted in 2007 because the results were acceptable for newly paved SMA pavement and friction levels were expected to increase shortly after the RHVP opened.

In short, in answer to Questions 17 to 20, the results of the MTO friction testing in 2007 were circulated amongst MTO staff over time and were provided to Dr. Uzarowski of Golder on behalf of the City, there was no obligation on the part of the MTO to provide the results to Council or the public, the MTO Report did not contain findings or information that would have triggered Council to make safety changes to the road or order further studies, and the non-disclosure of the results of the MTO friction testing in 2007, or the information and recommendations contained therein, did not contribute to accidents, injuries, or fatalities on the RHVP since January 2014.

In answer to Question 21, the MTO subsequently performed friction testing on the RHVP for the purpose of evaluating the suitability of the Demix aggregate to be placed on the MTO’s Designated Sources for Materials list (in 2008 and 2009) and to remain on the Designated Sources for Materials list (in 2010, 2011, 2012, and 2014). All of this testing was conducted pursuant to the MTO’s standard procedures for assessing applications for listing on the Designated Sources for Materials list and for maintenance of an existing listing and distributed to the standard distribution group

for Designated Sources for Materials-related friction test results within the MTO. It was not performed or analyzed for traffic safety purposes. The MTO did not conduct or direct any other asphalt and/or road safety reviews or assessments, aside from the aforementioned Designated Sources for Materials-related friction testing, in respect of the RHVP. The fact of this friction testing and the results remained unknown to City staff and Dr. Uzarowski until after the Tradewind Report was disclosed to the public. The City received the MTO's 2008 to 2014 RHVP friction test results from the MTO on February 12, 2019. These results are discussed below.

## The Tradewind Report and the 2014 Golder Report

After heavy rainstorms in September 2013, the City's roads maintenance staff, who were on-site on the RHVP for their maintenance and operations work, raised concerns within Public Works that they, the police, and the public believed that the RHVP was unduly "slippery when wet". Mr. Moore told his colleagues that the SMA surface course exceeded all MTO criteria, but he volunteered to obtain friction testing for the express purpose of using the results to defeat any litigation claim that might arise in the future. He also volunteered to let his colleagues, including staff in the Traffic group, know when he received the results.

Mr. Moore asked Golder to arrange to have friction testing conducted on the roadway surface. Golder in turn engaged Tradewind, which conducted such testing on November 20, 2013. Tradewind used a GripTester to conduct the testing, which is a different type of friction testing equipment from the MTO's locked-wheel friction tester. The GripTester produces GripNumber ("GN") values which are not equivalent to the MTO's locked-wheel testing equipment and resulting FN values. For this reason, the Tradewind results cannot be compared directly to the MTO results or against the FN30 threshold that the MTO uses.

At the time, Mr. Moore had already engaged Golder to conduct a review of the RHVP pavement after six years of in-service operation, and after two flooding events. This project was led by Dr. Uzarowski and became the 2014 Golder Report. Mr. Moore's focus for this project was the preservation of the perpetual pavement structure.

In part because of Mr. Moore's past involvement in the design and construction of the RHVP and his preeminent knowledge of pavement-related matters within the

City, as well as his management style, Mr. Moore maintained personal involvement, supervision, and decision making relating to the RHVP within Engineering Services. Although he was a director, he acted as the project manager on RHVP projects that involved retaining Golder, including the 2014 Golder Report project and the related Tradewind friction testing, without input, involvement, or awareness of other colleagues in Engineering Services.

Mr. Moore received the Tradewind Report on January 31, 2014, as an appendix to the 2014 Golder Report, which was sent electronically. Dr. Uzarowski also provided Mr. Moore with a hard copy of the complete 2014 Golder Report at an in-person meeting on February 7, 2014. In each case, Golder had applied a "draft" watermark on the entire 2014 Golder Report, including the appendices, despite the Tradewind Report being final. Mr. Moore had no comments on either report and both he and Dr. Uzarowski treated the 2014 Golder Report, including the appendices, as final. Golder and Tradewind also both viewed their reports as final. The "draft" watermark did, however, result in confusion later when Mr. McGuire found the Tradewind Report in 2018.

In the "Conclusion and Recommendations" section of the Tradewind Report, Tradewind found the LINC results to "indicate a generally uniform pavement surface texture and composition, with limited variation due to vehicular traffic wear." However, Tradewind noted that "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" and concluded that:

> [t]he 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.

The 2014 Golder Report addressed the Tradewind friction testing in one section and in its recommendations. While there are certain problems with Golder's interpretation of these results as Dr. Uzarowski was not familiar with the UK standard referenced by Tradewind, his conclusion after conducting some personal research was clear. After describing the testing and noting that the complete results of the friction testing were provided in the Tradewind Report in Appendix E, he set out the average friction numbers for each of the lanes tested, which ranged from 34 to 39. The 2014 Golder Report then set out Dr. Uzarowski's conclusion as follows:

> Although the Friction Number (FN) values are higher than when measured in 2007 immediately after construction (between 30 and 34), they are considered to be relatively low. Typically the FN values should be at least equal to or higher than 40 to be considered adequate. In the United Kingdom, for example, the FN values should be at least 48 for a motorway pavement.

The 2014 Golder Report recommended a mill and overlay resurfacing on sections where Golder had observed the most frequent top-down cracking of the pavement surface and routing and sealing of cracks followed by the application of a single layer of microsurfacing on the remainder of the RHVP. It noted that the effect of these treatments would be to remedy the top-down cracking and also address the issue of the relatively low friction levels on the RHVP.

The Tradewind Report was credible and reliable when it was delivered to Mr. Moore in 2014. It contained a clear recommendation. It was unambiguous. It was not, as suggested by Mr. Moore and later repeated by others, inconclusive. Although the Tradewind Report applied an outdated UK standard, the results were still below the UK investigatory level applying the correct UK standard.

The Inquiry heard from two pavement experts, Mr. Hein and Dr. Flintsch, who both testified that one cannot simply import friction standards from foreign jurisdictions to form the basis of a friction management program in Ontario. However, Dr. Flintsch was also of the opinion that the standard in the Tradewind Report could still be applied as a "good reference" in this individual case. Dr. Flintsch opined that the Tradewind Report ought to have sparked further investigation, including investigation to determine whether the friction demand may be exceeding the available friction by

reviewing the geometry, speeds, traffic, and the collision history and, if necessary, further testing with a different device if the recipient was unfamiliar with the GripTester or unsure about applying the UK standard. Mr. Hein, in turn, acknowledged that, had he received the Tradewind Report in early 2014, he would have recommended a further investigation as Tradewind had. He also would have recommended locked-wheel friction testing be conducted because he was more familiar with that device and how to interpret its results.

I return to these reports below.

## RHVP Traffic-Safety Initiatives and Pavement-Related Studies and Events From 2013 to 2015[18]

Several questions in the Terms of Reference relate to the circumstances and the consequences of non-disclosure of the Tradewind Report after it was provided to the Department of Engineering Services in January 2014. Answering these questions requires an understanding of the various initiatives and studies undertaken by the Traffic group and Engineering Services regarding traffic safety on the RHVP and the maintenance of the RHVP pavement structure, respectively.

As noted above, during this period, there was an absence of a shared sense of responsibility within Public Works for addressing the collision experience on the RHVP and LINC. The resulting siloed approach to issues relating to the RHVP was exacerbated by the absence of a clear understanding of responsibility for matters that crossed divisional lines and personality issues that had the result of deferring, rather than resolving, certain recommendations that were opposed.

### The 2013 CIMA Report[19]

Following public complaints, and the first fatal collision involving two people on the RHVP in September 2012, the PWC passed a motion in January 2013 directing staff to investigate upgrading the lighting in the vicinity of the Mud Street/Stone Church

[18] These initiatives and studies are addressed in Chapters 6 through 9.

[19] The 2013 CIMA Report is described in Chapter 6.

Road interchanges (the “study area”) as well as better signage and lane markings or other safety initiatives in that area.

At first, Traffic proposed that Traffic and Engineering Services address signage and lighting separately, which was consistent with the allocation of RHVP-tasks referenced above. In the end, Traffic led the 2013 CIMA project, and a project manager from Engineering Services’ Street Lighting & Electrical Engineering group was assigned to the 2013 CIMA project team. The project team did not appear to have a staff member to give input on behalf of other divisions of Engineering Services. There was no project charter in place that would have clarified individual roles and the respective responsibilities of the Traffic group and Engineering Services. There was also a lack of standards and/or processes for clear communication internally or with CIMA.

The 2013 CIMA Report included a collision analysis within the study area which revealed that single motor vehicle accidents were the most common accident type. In addition, non-daylight collisions on the mainline and on a particular ramp were at levels significantly higher than the provincial average, as were wet surface collisions on a particular stretch of the mainline and the same ramp.

CIMA recommended a number of countermeasures to address the collision patterns identified on the ramps and various sections within the study area. These recommendations included changes to signage and pavement markings including “slippery when wet” signs, applying a high friction surface course to the Mud Street ramp, and conducting friction testing across the entire RHVP study area. The application of a high friction surface course and friction testing recommendations were intended to improve friction on the ramp and assess whether friction was contributing to the collision experience, respectively. CIMA also determined that illumination was warranted on the ramps of the Mud Street interchange, although CIMA noted that illumination did not need to be implemented simply because a warrant had been achieved. CIMA did not assess the geometry and received direction from City staff not to consider recommendations for pavement treatment on the RHVP mainline.

The PWC motion had contemplated an investigation of illumination on the mainline of the RHVP in the study area. CIMA included in its report its assessment and recommendation regarding illumination on certain interchanges but did not include its assessment of continuous mainline illumination, which it had conducted. CIMA’s self-

imposed reduction in its scope occurred as a result of a conversation between Brian Malone (Partner, Vice-President, Transportation, CIMA) and Mr. Moore, about which neither advised other City staff nor CIMA staff. Mr. Moore told Mr. Malone that lighting was prohibited on the mainline RHVP because of environmental constraints identified in the environmental assessment ("EA") process required to approve construction of the RHVP.

Traffic staff recommended a "phased approach" that focused on implementing lower cost countermeasures first and deferred the implementation of CIMA's recommendation to install lighting at certain interchanges. Traffic staff asked CIMA to include the City's timeline for implementation in the 2013 CIMA Report, which had been finalized, and CIMA did so. Traffic staff prepared a staff report to the PWC containing these recommendations. Traffic staff did not discuss CIMA's recommendations for friction testing or the application of the high friction pavement surface with Engineering Services at any point during the project or, it appears, after the PWC approved these recommendations. The staff report referenced only vague commitments that Traffic would consult with Engineering Services regarding these countermeasures.

While the PWC accepted the proposed phased approach in November 2013, the PWC did not agree to remove an assessment of illumination from its outstanding business list. Instead, the PWC directed that staff report back respecting the lighting issue one year later, following an assessment of the effectiveness of the other countermeasures.

Mr. Moore displayed significant frustration to his colleagues about this direction regarding lighting. This tension between Mr. Moore, who did not believe lighting to be practical, affordable, or permissible under the EA for the RHVP, and the PWC, who sought a meaningful investigation of the lighting on the RHVP, continued throughout the relevant period for this Inquiry. Regardless of the merits of Mr. Moore's views regarding the feasibility of illumination of the mainline RHVP, he should have provided his views to the PWC in advance of the completion of the 2013 CIMA Report, so that the PWC could determine how, or if, they wanted staff to continue to address the issue of lighting on the RHVP, as it was a central issue in the PWC's motion. As described below, much later, in 2018, CIMA completed a study regarding lighting, and found that lighting was not prohibited but would require a fresh EA process and further studies.

Traffic and Engineering Services did not coordinate on the implementation of the countermeasures recommended in the 2013 CIMA Report. Traffic started implementing the signage and marking measures within its authority in 2014 and installed temporary "cat's eyes" illuminators and curve warning and "slippery when wet" signs around the Mud Street ramp by November 2015. Traffic and Engineering Services did not discuss the friction testing or the application of the high friction pavement surface. Public Works did not appear to have a tracking process for the recommendations. Engineering Services never took responsibility for these items within the project team or before the PWC, and Traffic never viewed them as falling within their scope of responsibility. Without a clear project team with senior staff from both sections, no division in Public Works took responsibility for completing and updating the PWC about friction testing or the high friction pavement application. Effectively, Traffic deferred countermeasures that fell under Engineering Services to Engineering Services, until Engineering Services was prepared to implement them.

## The Commission of the Tradewind Report and the 2014 Golder Report[20]

Concurrently but independently of CIMA's mandate that produced the 2013 CIMA Report, Mr. Moore engaged Golder to conduct a review of the RHVP after six years of in-service operation which, in September 2013, expanded to include having friction testing conducted on the roadway surface, as noted above.

In advance of receiving the Tradewind Report in January 2014, on January 24, 2014, Dr. Uzarowski sent Mr. Moore a summary of the average friction values from the 2007 MTO testing and the average friction values from the Tradewind Report (the "January 2014 Uzarowski Email"). The MTO results for Southbound Lane 1 averaged FN33.9, while the MTO results for Southbound Lane 2 averaged FN33.8. The January 2014 Uzarowski Email stated that the average FN numbers by lane from the Tradewind Report were 35 for the southbound right lane, 34 for the southbound left lane, 36 for the northbound right lane, and 39 for the northbound left lane. Mr. Moore provided that information to an industry colleague for use in a presentation.

[20] The Tradewind Report and the 2014 Golder Report are described in Chapter 6. My conclusions in respect of these reports are set out in Chapter 12.

Until 2016, this email summary formed the basis of Mr. Moore's understanding that the Tradewind friction results were comparable and were "better" than the 2007 MTO testing results. This was incorrect because, as noted above, as a result of the different testing equipment that Tradewind and the MTO used, the Tradewind GripNumber values cannot be compared to the MTO results or assessed based on the MTO's informal FN30 investigatory threshold.

Notwithstanding that Mr. Moore was not aware of this, Mr. Moore should have understood from the words in the body of the 2014 Golder Report, which he read in January or February 2014, that Golder was of the view that the friction levels for at least some sections of the RHVP were relatively low. From the Tradewind Report, if he had read it, he would also have understood that Tradewind was of the view that these levels warranted further investigation and potentially remediation.

However, based on Mr. Moore's actions over time, I have concluded that Mr. Moore did not read the Tradewind Report when he received it in January 2014 and did not do so in any detail until December 2015. During that two-year period, and despite his discussion with Dr. Uzarowski in February 2014, Mr. Moore's understanding of the friction test results on the RHVP was limited to the content of the January 2014 Uzarowski Email.

I cannot make any definite findings as to why Mr. Moore did not act on Golder's recommendations in the 2014 Golder Report, which he had read, after January 2014. However, Mr. Moore viewed that advice through the lens of what he cared about: the surface of the pavement. He was unconcerned with improving friction on its own, rather than as a side benefit of any action to maintain the integrity of the pavement. He understood Golder's recommendation to undertake a mill and overlay on a portion of the RHVP and routing and sealing followed by microsurfacing on the balance as part of Golder's analysis that the RHVP pavement had some cracking. He did not think this pavement surface recommendation was urgent. His failure to consider the traffic safety implications of "relatively low" friction values reveals how narrowly he viewed his role.

Mr. Moore's failure to carefully review the Tradewind Report from January 2014 to December 2015 was a significant lapse of his duty as Director of Engineering Services and as the *de facto* project manager on the 2014 Golder Report project, in light of the

statements he made during this period to the PWC, his colleagues, and Mr. Malone, described below.

## The 2015 CIMA Report[21]

In October 2014, a young man and woman were killed on the LINC when their vehicle crossed the median and collided with vehicles travelling westbound. The Traffic group subsequently engaged CIMA to complete a safety review of the LINC, which resulted in what was referred to as the "2015 CIMA LINC Report".

On May 5, 2015, two young women travelling northbound on the RHVP at night were killed in a crossover collision when their vehicle crossed the median barrier and collided with a vehicle travelling in the southbound lanes near Greenhill Avenue. As a result of this collision, the PWC directed staff to investigate additional safety measures for the RHVP and LINC, such as guardrails, lighting, and lane markings, to prevent further fatalities and serious injuries. Another fatal collision on the RHVP occurred in July 2015.

The Traffic group engaged CIMA to complete a safety review of the entirety of the RHVP, which included the most challenging area between the Greenhill Avenue and Queenston Road interchanges. This assignment resulted in what was referred to as the "2015 CIMA Report". The City's internal team for this project did not include anyone from Engineering Services. However, Mr. Moore had some involvement, described below.

The 2015 CIMA Report included a collision analysis that reflected a similar collision experience as CIMA had found in the study area in 2013, but this time for the entire RHVP. CIMA found in 2015 that the highest concentration of collisions occurred at specific locations that broadly fell between the Greenhill Avenue and Queenston Road interchanges and near the Mud Street on ramps. Of significance, all locations mentioned in the 2015 CIMA Report were "within, on approach to, or leaving a horizontal curve." CIMA also found that illumination on the RHVP mainline was warranted using warrants from the Transportation Association of Canada Roadway Lighting Guide and MTO Policy for Highway Illumination, subject to a cost-benefit analysis.

[21] The 2015 CIMA Report is discussed in detail in Chapter 7.

CIMA concluded, based on its collision review, that it appeared that the combination of high vehicle speeds and wet surface conditions might have been the primary contributing factors to collisions on the RHVP, particularly in the vicinity of the King Street and Queenston Road interchanges where vehicles must travel small-radius horizontal curves.

During the preparation of the 2015 CIMA Report, Mr. Malone of CIMA contacted Mr. Moore directly to obtain information on RHVP friction testing, rather than going through the Traffic group or the members of the project team. Mr. Moore provided Mr. Malone with a copy of the January 2014 Uzarowski Email which contained the summary results of the MTO 2007 and Tradewind 2013 friction testing. Mr. Moore advised that these results were not for republication, without explanation. In response to Mr. Malone's questions regarding this testing, Mr. Moore provided incorrect information suggesting, among other things, that both tests had been conducted by the MTO, that the results were comparable and, therefore, by inference, that the 2013 results were better than the 2007 results. In my view, this delivery of incorrect information was the result of Mr. Moore's lack of interest in friction testing, rather than an intention to mislead. Regardless, his failure to provide accurate and complete information, including locating and providing a copy of the Tradewind Report itself, was careless and fell below his responsibilities as Director of Engineering Services. This error was compounded by the fact that neither Mr. Malone nor Mr. Moore told anyone in Traffic or on the project team about their discussion.

After CIMA sent the Traffic group a draft of the 2015 CIMA Report, David Ferguson (Superintendent, Traffic Engineering, Traffic Operations & Engineering; Energy, Fleet & Traffic; Corporate Assets & Strategic Planning; Public Works, Hamilton) sought buy-in from Engineering Services and other divisional directors in Public Works. Mr. Moore applied a nominal safety lens. He challenged the CIMA recommendations that Engineering Services would be responsible to implement (illumination, friction testing, median barriers), and asserted that Engineering Services was not required to investigate or fund the implementation of these countermeasures.

CIMA delivered the 2015 CIMA Report in November 2015. In the report, CIMA proposed a number of countermeasures, including targeted police enforcement for speeding and installation of speed feedback signs, oversized speed limit signs, continuous

illumination, and “slippery when wet” signs. To mitigate median-related collisions, CIMA recommended that the City install a high-tension cable median barrier.

CIMA also recommended that the City conduct friction testing under normal conditions and under typical wet pavement conditions, near locations with the highest frequencies of wet surface collisions, especially the curves, with a special focus on the curves near the King Street and Queenston Road interchanges. Mr. Moore told CIMA and Traffic staff in October 2015, likely for the first time, that he had friction testing conducted and that the results were satisfactory, in reliance on the January 2014 Uzarowski Email and not having reviewed the Tradewind Report. In November 2015, after review of the 2015 CIMA Report, Mr. Moore nevertheless continued to express the view that CIMA’s recommended friction testing would be of no value. Traffic staff did not take any steps to obtain the results Mr. Moore referenced in October, which in my view, reflected the view of Traffic staff that Engineering Services was responsible for friction testing, and a desire not to engage with Mr. Moore on this issue.

Staff were responsible for adequately summarizing CIMA’s report in their staff report to the PWC. The staff recommendation report, prepared by Traffic staff, that ultimately went to the PWC was not clear or complete. It did not set out that a high proportion of collisions were occurring under wet conditions on the RHVP or explain in plain language that CIMA had found that a combination of high vehicle speeds and wet surface conditions, exacerbated by the geometry of the parkway in certain locations, might be the primary contributing factors to collisions on the RHVP, or that in the four tight curves in the vicinity of King Street and Queenston Road, vehicles “slightly exceeding the design speed could run off the road while negotiating these curves.” Instead, the emphasis was very much on excessive speeding.

The 2015 CIMA Report categorized its recommendations as short term, medium term, and long term without including set timeframes. Friction testing was listed as a short term recommendation. The short term recommendations all fell within the scope of Traffic, except the recommendation to conduct friction testing. The long term recommendations included rumble strips, median barriers, and end-to-end illumination, all matters that were within the scope of Engineering Services.

In the staff report, Traffic staff characterized friction testing as a medium term recommendation (2 to 5 years). The staff report sought PWC approval to defer the

countermeasures staff had identified as medium term and long term pending the outcome of the Transportation Master Plan ("TMP") update. The TMP update was to address the potential widening of the RHVP and the LINC. There was no basis to list friction testing as a medium term countermeasure or to defer it; friction testing had no connection to the widening and CIMA was clear that friction testing was intended to assess whether current friction levels were a contributory factor to the wet surface collisions and to establish a baseline friction level for comparison purposes.

Subsequent to the finalization of the recommendation report and before it was presented to the PWC, the Traffic group asked CIMA to conform its report to the staff report by moving friction testing to a medium term recommendation. CIMA declined to change its listing of friction testing as short-term, although CIMA and the Traffic group did not discuss why CIMA had done so, and the Traffic group did not change its characterization of friction testing as a medium term recommendation in the staff report presented to the PWC.

As a result of the division of responsibility for, and deferral of, the countermeasures identified as medium and long term, none of the work that would be the responsibility of Engineering Services had to be completed (or even considered) pending the outcome of the TMP, which was on an unknown timeline. This included the specific friction testing CIMA had recommended. In my view, this approach, which involved deferring these items, was adopted by one or more of those in the Traffic group — being Mr. Ferguson; Martin White, the Manager of Traffic Operations & Engineering; their superior, Geoff Lupton, the Director of Energy, Fleet & Traffic; or Mr. Lupton's superior, John Mater, the Director of Corporate Assets & Strategic Planning[22] — to avoid a confrontation with Mr. Moore regarding the merits of these countermeasures.

The staff report on the 2015 CIMA Report (and the companion 2015 CIMA LINC Report) was presented to the PWC on December 7, 2015. After some internal discussion, Traffic staff provided both of CIMA's reports to the PWC members in advance of this meeting.

[22] As noted above and in more detail in Chapter 4, from late 2012 or early 2013 until 2017, Traffic Operations & Engineering was within the Energy, Fleet & Traffic section of the Corporate Assets & Strategic Planning division of Public Works.

The PWC approved the recommendation report and directed that staff install signs at appropriate locations on the LINC and the RHVP stating the penalties and costs associated with speeding. The PWC also directed staff to report to the PWC on the costs and process of investigating an improved lighting system on the RHVP and the LINC, which had not been done despite the PWC's direction in November 2013 that staff provide an update on lighting after one year of the other countermeasures being implemented. Staff were also directed to investigate installing rumble strips on the sides of the LINC and seek out provincial approval from the MTO to allow the City to implement photo radar on the RHVP and the LINC, and assess the feasibility of implementing photo radar.

## Mr. Moore Returns to the Tradewind Report in Late 2015/Early 2016[23]

Mr. Moore attended the PWC meeting on December 7, 2015, at which Traffic staff presented the recommendation report on the 2015 CIMA Report. In response to a question from a councillor reflecting public concern with the quality of the asphalt surface, Mr. Moore stated that the MTO had done testing on the RHVP initially and found it was "at or above what they would normally find with their high grade friction mixes", and that he had friction testing performed in approximately 2012/2013, which found that the road was holding up "exceptionally well", that staff had no concerns about the performance of the surface mix, and that the quality of the RHVP was above the grade of 400-series highways in Ontario.

As a result of the focus on speeding and the comfort Mr. Moore provided that the pavement was not contributing to collisions, the PWC was left with the impression that speeding was the principal cause of collisions on the RHVP. This explanation of collisions downplayed the significance of the high proportion of wet surface collisions and the factors which CIMA had identified as contributing to such collisions, in addition to "excessive speed". Given their familiarity with the 2015 CIMA Report, Traffic staff should have better explained to the PWC, both in their staff report and at the PWC meeting, the multiple possible contributing factors identified by CIMA that affect the speed at which the RHVP becomes more challenging to drive.

[23] See Chapter 7 and my conclusions on these issues in Chapter 12.

Shortly after the PWC meeting, prompted by an email from Mr. Moore, Dr. Uzarowski sent Mr. Moore a second copy of the Tradewind Report by email (the "December 2015 Uzarowski Email"). I am satisfied that Mr. Moore read the Tradewind Report, likely for the first time, at or around this time. Mr. Moore had questions about the applicability and utility of the Tradewind results because the Tradewind Report referenced the UK standard, which he directed Dr. Uzarowski to answer.

Before he received this information from Dr. Uzarowski in March 2016, Mr. Moore discussed friction testing with his colleagues twice. First, on February 16, 2016, he instructed Mr. Ferguson to advise the Mayor's Office, certain councillors,[24] and a local community group that Engineering Services would complete friction testing in 2016, which Mr. Ferguson did. This was in response to the community group's request to Council that friction testing be treated as a short term safety option consistent with the 2015 CIMA Report, rather than a medium term safety option as recommended in the staff report. However, Engineering Services had not planned any friction testing in 2016 and none was completed after this commitment.

Second, on February 25, 2016, Mr. Moore sent an email to Mr. Lupton and Mr. Ferguson (which Mr. Lupton later forwarded to Mr. White), in which he stated:

> FYI – Some roughness/skid resistance/friction testing has been done. However I'm still trying to get the analysis for it and to put it into context (like how does this compare to other highways of similar type) MTO is very guarded of this information and does not share numbers due to liability and concerns they will form part of a legal action. We should be similarly wary!

Mr. Moore did not provide his colleagues with an update to this email. Although their requests were not in writing, I accept that one or more Traffic staff made at least one verbal request for these results to Mr. Moore between the December 2015 PWC meeting and the end of 2017. The Traffic group manager, Martin White, testified that, by the summer of 2017, he thought that the intervention of someone at the director level or even the General Manager of Public Works would be required to get this information from Mr. Moore, but there is no evidence that Mr. White made a direct

[24] See Chapter 7 for a full list of councillors copied on this email.

request to his superiors — Mr. Lupton (during his tenure until 2017) or Mr. Mater — to do so. Within the Traffic group, Mr. White and Mr. Ferguson testified that they had no expertise in evaluating friction testing results. They viewed friction testing as Mr. Moore's responsibility, consistent with the siloed approach to responsibilities, and Mr. Lupton and Mr. Mater were content to do the same. However, Traffic staff should have pressed to receive a copy of the friction testing results, and if, upon receipt, they felt unable to evaluate the friction testing results, they should have taken steps to understand their significance, including retaining CIMA or another expert.

At a meeting on March 14, 2016, after he had researched the answers to Mr. Moore's questions, Dr. Uzarowski told Mr. Moore there was no clear correlation between results from a GripTester and results from a locked-wheel tester, and indicated that the Tradewind GripNumbers, although numerically higher than the 2007 MTO locked-wheel numbers, were not indicative of the Tradewind results being either "better" than the MTO's prior results, or satisfactory. Dr. Uzarowski also made recommendations to Mr. Moore for pavement remediation techniques that could address low friction — microsurfacing and shotblasting — although their subsequent discussions revealed some talking at cross purposes on this point and Mr. Moore ultimately declined to consider those techniques.

As such, by March 14, 2016, Mr. Moore had no basis to discount the findings and recommendations in the Tradewind Report. Despite this, Mr. Moore dismissed the information that Dr. Uzarowski gave him.

There were no City by-laws that required disclosure of the 2014 Golder Report or the Tradewind Report to Council or the PWC in 2014 or 2016. Not all consultant reports had to be reported. However, in light of the circumstances and the evidence at the Inquiry of both Dr. Flintsch and Mr. Hein, at a minimum Mr. Moore should have ensured that a further investigation into the pavement condition was completed to understand the circumstances resulting in the low friction levels. Even if Mr. Moore had remaining questions about the applicability in Ontario of the UK standard referenced in the Tradewind Report, there were options for further investigation, including further locked-wheel testing, that would have addressed those questions.

In any event, Mr. Moore should have provided the Tradewind Report and any information he had about how to interpret the results to his colleagues in the Traffic group, at the very latest, by March 2016 in order that they could determine whether the friction levels were of significance for traffic safety on the RHVP. There was no justification for Mr. Moore's failure to provide a copy to his colleagues in the Traffic group.

In April or May 2016, the Asset Management section of Engineering Services decided to consider surface treatment rehabilitation of the RHVP in 2017. Mr. Moore testified that he considered that rehabilitation would automatically improve friction levels on the RHVP, although he did not think the levels needed to be improved in 2016. Rehabilitation likely would have improved friction levels on the RHVP, if the right materials and treatment were used. However, this did not relieve Mr. Moore of his obligation to provide the Tradewind Report to the Traffic group.

## Resurfacing and Other Traffic Safety and RHVP-Related Activity From 2016 to 2018[25]

During the period between 2016 and mid-2018, there were continued collisions and fatalities on the RHVP and commensurate calls for action from councillors and the public. The Public Works department, in particular the Engineering Services division and the Traffic group, were involved in a number of RHVP-related projects, studies, and reports. Throughout this period, Traffic staff implemented some, but not all, of the approved countermeasures from the 2015 CIMA Report. Implementation of at least some of these countermeasures was tied to the planned resurfacing and was thus delayed.

I note that while the work of Engineering Services and Traffic during this period largely proceeded independently in a continuing siloed fashion, the new General Manager of Public Works, Dan McKinnon, who assumed the role in September 2016, made efforts to coordinate staff's activities on outstanding RHVP-related matters in a more coherent manner.

[25] Chapters 7, 8, and 9 address this time period and the initiatives that occurred throughout it.

*RHVP Resurfacing*[26]

The most significant of the RHVP-related activities during this period was the decision to resurface the RHVP. At the time the RHVP was built, the first resurfacing of the SMA pavement was anticipated to occur in year 21 of the parkway's operation (that is, 2028), based on expected traffic volumes. Ultimately, the first resurfacing occurred in the spring/summer of 2019, much earlier than originally anticipated, as a consequence of, among other things, higher than anticipated traffic volumes on the RHVP.

In May 2015, Mr. Moore advised the PWC that the first "wholesale resurfacing" was anticipated in 2021. As noted above, Engineering Services first began actively considering surface treatment rehabilitation of the RHVP in the spring of 2016. By early 2017, the plan had shifted to a complete resurfacing of the RHVP. The decision to resurface the RHVP on this accelerated timeline was made entirely by staff of Engineering Services. The Inquiry did not receive evidence to clarify what triggered the decision in 2016 to consider rehabilitation of the RHVP, nor clear evidence to clarify the reason for the shift to resurfacing, except that resurfacing would be more cost-effective than surface treatment rehabilitation in the long term.

Of note, Mr. Moore was the only Public Works staff member who was aware of the Tradewind friction testing results at the time the rehabilitation and resurfacing decisions were made. Although Traffic staff deferred certain traffic-related pavement work on Mr. Moore's advice in order that the pavement work would be coordinated with future rehabilitation works, Mr. Moore made no mention of the Tradewind Report or the 2014 Golder Report to any of his colleagues. One such countermeasure that was delayed was the short term countermeasure of raised pavement markings, which were intended to assist drivers in seeing and navigating the lanes of the RHVP. City staff had continued to receive complaints about lane visibility on the RHVP during this period, including from Mayor Fred Eisenberger and one councillor.

Staff in Traffic and Engineering Services discussed the scope for the RHVP resurfacing project throughout 2017. Although Traffic staff initially requested that the project scope include installation of median barriers (which, as noted above, was a long term recommendation from the 2015 CIMA Report that had been deferred pending further

[26] The resurfacing of the RHVP is discussed in Chapters 7, 8, 9, 10, and 11.

assessment of widening the RHVP and the LINC), Mr. Moore and his staff objected to the inclusion of this work in the scope for the resurfacing project. When Mr. White and Mr. Ferguson escalated this disagreement to Mr. Mater, Mr. Mater advised his staff to remove their request for the installation of median barriers because that issue had been deferred. At that time, the resurfacing, using a traditional mill and overlay method was anticipated to occur in two stages, with one direction of the RHVP to be resurfaced in 2018 and the other direction in 2019.

The RHVP resurfacing, originally anticipated to begin in 2018, did not occur until 2019 as a result of Engineering Services' consideration of a different resurfacing method for the RHVP – namely, hot in-place recycling or HIR. HIR involves, as its name suggests, recycling of the existing asphalt surface course in a new pavement surface which, because of these recycling benefits, is potentially less expensive and more environmentally friendly than a traditional mill and overlay, in which the top asphalt layer is milled and replaced with new asphalt material.

Mr. Moore began to consider HIR in November 2017, following a discussion he and Dr. Uzarowski had with a British Columbia-based contractor at that time. In connection with this, Mr. Moore retained Dr. Uzarowski and Golder to conduct three field tests on the RHVP: British Pendulum Testing ("BPT"), Polished Stone Value ("PSV") testing, and pavement texture measurements. The focus of Golder's engagement (referred to as the "Golder Pavement Evaluation") was HIR. Although BPT is a type of friction test and an aggregate's PSV is an indication of its resistance to polishing, the purpose of the Golder Pavement Evaluation testing was to evaluate the suitability of the aggregate in the RHVP's SMA surface course for use in HIR. It was not testing to satisfy the friction testing recommended by CIMA in the 2015 CIMA Report, nor testing that would have been responsive to Tradewind's recommendation for additional testing, which Mr. Moore did not think was necessary in light of the resurfacing. Either way, Mr. Moore did not approve the Golder Pavement Evaluation testing with any intention that it would be used for any traffic safety purpose.

The results of the Golder Pavement Evaluation testing left Dr. Uzarowski with significant reservations about the feasibility of recycling the SMA in an HIR resurfacing and its economic benefits. Dr. Uzarowski's views that HIR was not feasible were met with resistance from City staff, especially Mr. Moore, in a meeting on March 9, 2018. At that meeting, Dr. Uzarowski recommended against using HIR, instead recommending

either a mill and overlay or using hot-in-place recycling of the SMA in combination with a microsurfacing treatment. Although Dr. Uzarowski testified that he raised the prior Tradewind friction testing and the possibility of shotblasting or other remediation for the RHVP at this meeting, none of the City witnesses who attended the meeting had a specific recollection of prior friction testing results being discussed or of Dr. Uzarowski using the name "Tradewind".

Notwithstanding Dr. Uzarowski's initial reservations, he agreed to reconsider and see whether an asphalt mix using SMA in an HIR resurfacing was feasible and suitable. This resulted in a further mandate of Golder for a study referred to as the "HIR Suitability Study". Golder's work on the HIR Suitability Study overlapped with Mr. Moore's retirement as Director of Engineering Services and Mr. McGuire's appointment as his successor, discussed further below. Mike Becke (Senior Project Manager, Design, Engineering Services, Public Works, Hamilton) became the City's lead on the HIR Suitability Study following Mr. Moore's retirement in May 2018. As a result of discussions with Golder staff in this context, Mr. Becke received a copy of the Tradewind Report in late August 2018, which he did not read until mid-September 2018, shortly before Mr. McGuire discovered the Tradewind Report. This was the first time any Engineering Services staff aside from Mr. Moore received a copy of the Tradewind Report. Eventually, as set out below, the consideration of HIR was abandoned in favour of the mill and overlay resurfacing method.

*The Lighting Study*[27]

In September 2016, Mr. Moore submitted a staff report to the PWC in response to the PWC's December 2015 direction to provide information regarding the costs and process to investigate an improved lighting system on the RHVP and the LINC. In my view, the intention in this staff report was to discourage further consideration of lighting on the RHVP mainline, at least until a decision was made on the possible widening of the RHVP. However, the PWC remained engaged with the issue. In September 2016 and December 2017, the PWC issued further directions to staff to study lighting enhancements, the costs thereof, and to advise what impact, if any, brighter lights could have on the RHVP EA. Ultimately, CIMA was retained in the spring of 2018 by Engineering Services staff to complete this study, referred to as the "Lighting Study".

[27] The Lighting Study is discussed in Chapters 8, 9, 10, and 11.

Of significance, the Lighting Study revealed that pre-construction environmental approvals had not precluded continuous lighting on the RHVP, a finding which contradicted a long-held assumption or understanding amongst City staff and councillors that such lighting had been prohibited by the RHVP EA. CIMA's collision analysis in the Lighting Study also confirmed CIMA's past findings that there was a "significantly higher" proportion of wet road collisions on the RHVP compared to the provincial average. It found, however, that non-daylight collision rates were in line with provincial rates.

*The Speed Limit Study*[28]

Traffic staff also retained CIMA in March 2018 to study the feasibility and safety benefits of reducing the existing posted speed limit on the RHVP and the LINC from 90 km/h to 80 km/h. This study, referred to as the "Speed Limit Study", was the result of an August 2017 direction of the PWC, spurred by ongoing concerns with speeding on the parkways and the injuries and two fatalities caused by speed-related accidents. Two young men had been killed in separate crossover collisions on the RHVP earlier that year, on January 26, 2017 and February 21, 2017, respectively.

*Report PW18008*[29]

In May 2017, senior Public Works staff met to brief Mr. McKinnon (then nine months into his role as General Manager of Public Works) on the numerous outstanding RHVP-related PWC directions. According to Mr. Mater, who organized the meeting, the RHVP was a "big topic of conversation, both in the public and within [Public Works]" at that time. Friction test results which, as Mr. Mater described, were "part of the Red Hill Valley" story, were listed as an agenda item for this meeting. I am unable to reach any findings about what, if anything, was discussed at this meeting about RHVP friction testing results. I am, however, satisfied that Mr. Moore neither discussed the existence of the 2014 Golder Report or the Tradewind Report by name nor provided a copy of either report to his colleagues.

[28] The Speed Limit Study is discussed in Chapters 8, 9, 10, and 11.

[29] Report PW18008 is discussed in Chapters 8, 9, 10, and 11.

Out of this meeting, the Traffic group prepared and submitted an omnibus recommendation report to the PWC — Report PW18008: Red Hill Valley Parkway and Lincoln Alexander Parkway Transportation and Safety Update — in January 2018, which consolidated the outstanding PWC directions to staff in respect of the RHVP and the LINC. This staff report recommended that the PWC direct staff to implement a broad range of safety and traffic initiatives, including the continued implementation of the approved short and medium term countermeasures from the 2015 CIMA Report. Appendix A to Report PW18008 identified the implementation status of these countermeasures since 2015. A line item of "Conduct Pavement Friction Testing" was marked as complete. Traffic staff had made the same representation about completed friction testing in an earlier information update submitted to Council in March 2017. When Traffic staff listed friction testing as complete, they relied on the statements Mr. Moore had made in the meeting with CIMA in October 2015, at the December 2015 PWC meeting, and in his emails in February 2016, and on the one or more verbal requests that one or more Traffic staff made for these results to Mr. Moore between December 2015 and the end of 2017.

Report PW18008 also recommended, and the PWC approved, that staff conduct an annual detailed collision analysis on the RHVP and the LINC. In 2018, Traffic staff prepared the 2017 Annual Collision Report, which reported on City collision data, including data specific to the RHVP, from 2013 to 2017. The 2017 Annual Collision Report, which was presented to Council at the meeting of the General Issues Committee ("GIC") on February 6, 2019, was the first network-wide collision data published by the City since 2010.

## Requests for Friction Testing and Friction Testing-Related Discussions[30]

Friction testing on the RHVP was the subject of several discussions amongst City staff and with the media in the late spring and early summer of 2017.

In late May 2017, a reporter for the Hamilton Spectator and a councillor (prompted by a request from the reporter) asked to receive a copy of RHVP friction testing results.

[30] Requests for friction testing results are described in Chapters 6, 7, 8, and 12.

The councillor's requests bounced around by email amongst numerous Engineering Services staff, including directly to Mr. Moore (who was out of the office on vacation) and to staff in the Asset Management, Construction, and Design sections of Engineering Services, as well as to Mr. White and Mr. Ferguson in Traffic. Ultimately, the councillor's requests proved unsuccessful; despite several requests over the course of a month, the councillor did not receive the Tradewind friction test results or the Tradewind Report from Mr. Moore.

The Hamilton Spectator reporter was also unable to obtain a copy of the Tradewind results or the Tradewind Report from Mr. Moore. The two did, however, speak about RHVP friction testing in connection with an article the reporter published in the Hamilton Spectator on July 15, 2017. In their discussions, Mr. Moore inaccurately described the results of the Tradewind testing as "inconclusive" and stated that there was no formal report of the friction testing, only an "informal chart sent in an email in December 2015", among other things. Mr. Moore also told the reporter that "instead of doing further testing, as was recommended, the city decided to repave". At the time of this article, Mr. Moore had not conveyed to his colleagues some of the information he told the reporter, including the inaccurate information. Variations on these statements appeared in subsequent media articles over time and Mr. Moore later made similar comments to his colleagues.

The publication of the article prompted a law clerk from Shillingtons LLP, the City's external legal counsel on a claim arising from a collision on the LINC, to request a copy of the friction testing results referenced in the article. She initially asked Mr. Ferguson, who had also been quoted in the July 2017 article. Mr. Ferguson directed the law clerk to Mr. Moore (whom she contacted), but he did not otherwise follow up, despite Traffic's past requests for these results and Mr. Ferguson's knowledge of the councillor's recent requests for them. On a call in August 2017, Mr. Moore gave information about the MTO testing, the SMA early age low friction issue, the Tradewind testing, and the proposed resurfacing of the RHVP in 2018/2019 to the Shillingtons law clerk and a partner at Shillingtons. He also sent her a standalone copy of the Tradewind Report, marking the only time Mr. Moore distributed a copy of the Tradewind Report to anyone.

The Hamilton Spectator article was also discussed internally in the City's Dispute Resolution group within its Legal Services division around this time, which prompted

a request for the study referred to in the article. The request was made to Diana Swaby (Claims Supervisor, Risk Management, Finance & Corporate Services, Hamilton), who directed the request to Mr. Oddi (Manager, Construction, Engineering Services, Public Works, Hamilton). The Inquiry did not receive evidence of further correspondence with Mr. Oddi. The Inquiry also did not receive evidence that City staff from Legal Services obtained the Tradewind Report before at least late 2018 or early 2019. However, Ms. Swaby received a reporting letter from Shillingtons that contained a four-paragraph summary of the Tradewind Report in January 2018 and received a copy of the Tradewind Report from Shillingtons in May 2018, the latter of which she testified that she would not have reviewed in detail due to its technical nature.

In a follow up Hamilton Spectator article published in January 2018, Mr. Moore was quoted as stating "[w]e don't know why they feel that [the pavement on the RHVP is] slippery... That's all part of (why the city is doing) the testing." Mr. Moore referenced the Golder Pavement Evaluation to foreclose the persistent questions from the media about friction testing, in a manner that misrepresented the purpose of that project.

## Personnel Changes and Restructuring in Public Works

The Public Works department, under Mr. McKinnon as General Manager, was restructured in January 2018. For purposes of this Inquiry, the two significant outcomes of this restructuring were: (1) the creation of a new division called Roads & Traffic, to which the Traffic group was transferred; and (2) the mandate and oversight responsibilities of the position of Director of Engineering Services being split between Mr. Moore and Mr. McGuire (then Manager, Geomatics & Corridor Management, Engineering Services, Public Works, Hamilton).

The result of the latter was that Mr. Moore's involvement in Engineering Services' projects reduced in the months before his retirement in May 2018. However, during 2018, he continued to play an active role in respect of the RHVP resurfacing project and was a driving force in Engineering Services' consideration of HIR, including the retainer of Golder to complete the Golder Pavement Evaluation in 2017 and the HIR Suitability Study in 2018, described above.

Mr. Moore and Mr. McGuire shared the portfolio of Director of Engineering Services until Mr. Moore's retirement in May 2018. Ultimately, Mr. McGuire succeeded Mr. Moore as the Director of Engineering Services in June 2018.

*Mr. Moore's Transition Out of the Director of Engineering Services Role*[31]

Mr. Moore's transition out of the role of Director of Engineering Services in the spring of 2018 was informal and haphazard. He prepared no transition memos or briefing documents and provided Mr. McGuire with only a "few" emails that Mr. Moore thought might be of value. Beyond this, Mr. Moore's transition process involved distributing certain hard copy documents to colleagues or filing them on a reference library shelf in Engineering Services' offices and uploading certain documents to ProjectWise, a software program used by Engineering Services staff.

Mr. Moore gave a hard copy of the 2014 Golder Report to his assistant, Diana Cameron, in a pile of hard copy documents. Mr. Moore also uploaded two emails into a folder in ProjectWise called "Director's Office (Engineering Services)" (the "Director's Office Folder"), accessible only to the Director of Engineering Services and his assistant. These emails were: (1) the January 2014 Uzarowski Email (that summarized the averages of the 2007 MTO and 2013 Tradewind friction test results) and (2) the December 2015 Uzarowski Email (which attached a standalone copy of the Tradewind Report). The latter was the copy of the Tradewind Report that Mr. McGuire ultimately "discovered" later in 2018.

The manner and location of Mr. Moore's uploading of the Tradewind Report to ProjectWise, in the absence of any other steps to alert his colleagues to the existence of this report, reveals, at a minimum, a disregard for maintaining any institutional knowledge about the RHVP after his departure from the City. A clear consequence of Mr. Moore's monopoly of RHVP-related information, as well as the lack of a repository for RHVP-related information, was that other members of the Public Works department, including Mr. McGuire, operated at an information deficit. That said, Mr. Moore clearly did not have an intention to "disappear" the Tradewind Report – if he had, he would not have uploaded it at all, nor would he have provided it to Shillingtons several months earlier.

[31] Mr. Moore's pre-retirement conduct is described in Chapter 9.

*Mr. McGuire's Transition Into the Director of Engineering Services Role*[32]

Mr. McGuire got up to speed in his new role in the spring and summer of 2018, having succeeded Mr. Moore as Director of Engineering Services after his retirement in May 2018.

This was a busy time in the Public Works department, particularly in respect of the RHVP. The Lighting Study, the Speed Limit Study, and the City's 2017 Annual Collision Report, overseen by staff in either Traffic or Engineering Services, were all in progress and the use of HIR as the method for the RHVP resurfacing was under continued consideration with Golder. In addition, the City's Office of the Auditor General (also called "Audit Services" or the Audit Services division) began a Value For Money audit (the "VFM Audit") looking into how the City tracked and managed pavement performance.

During the same period, the City's long-standing City Manager retired and was replaced by an Interim City Manager, Mike Zegarac, and Edward Soldo joined the City as the new Director of Roads & Traffic in the Public Works department and became responsible for traffic safety and the Traffic group.

In the spring and summer of 2018, Mr. McGuire had learned or come across several significant pieces of information about the RHVP, including historical information not shared with him by Mr. Moore. Among other things, Mr. McGuire learned about the collision experience on the RHVP from updated RHVP collision analyses, including some of Traffic's findings in the 2017 Annual Collision Report and CIMA's findings in the Lighting Study. He had also learned and requested further information about the "asphalt" testing that Golder was completing as part of the Golder Pavement Evaluation. Mr. McGuire was interviewed by the Hamilton Spectator for an article about RHVP asphalt testing and the resurfacing of the RHVP in July 2018. He spoke to Mr. Moore to prepare for this interview. Mr. McGuire also reviewed Mr. Moore's earlier statements in the July 2017 Hamilton Spectator article.

In the evening of August 30, 2018, Mr. McGuire looked through the ProjectWise database and came across the two emails that Mr. Moore had uploaded to the Director's Office Folder. Mr. McGuire forwarded the December 2015 Uzarowski

[32] Mr. McGuire's transition into his new role is described in Chapter 9.

Email to someone (the identity of whom is not established on the evidence) without reading the email or the appended Tradewind Report. He also forwarded the January 2014 Uzarowski Email to Mr. Malone of CIMA who, as noted above, had previously received a version of this information from Mr. Moore in August 2015. Although Mr. Malone understood Mr. McGuire's email to be a request for assistance in interpreting the results, my view is that Mr. McGuire wanted a second set of eyes on the subject as he tried to pull the pieces of the collision history and the upcoming resurfacing together. After a high-level discussion with Mr. Malone, Mr. McGuire did not pursue any issues related to RHVP friction for nearly one month, until he came across the December 2015 Uzarowski Email in the Director's Office folder for a second time on September 26, 2018.

## Answers to Terms of Reference Questions 1, 2, 3, 4, 5, and 13

Questions 1, 2, 3, 4, 5, and 13 of the Terms of Reference relate to the circumstances and the non-disclosure of the Tradewind Report after it was provided to Engineering Services in January 2014.[33] My detailed conclusions and answers to these questions are set out in Chapter 12.

[33] Questions 1 to 5 and 13 ask: ***1)*** *Identify all individuals who received a copy of the Tradewind Report or were advised of the Tradewind Report or the information and recommendations contained therein after it was provided to the City's Department of Engineering Services in January, 2014.* ***2)*** *Based on the City's by-laws, policies and procedures, as they were in 2014, should Council have been made aware of the Report, or the information and recommendations contained therein, once the Report was submitted to the Department of Engineering Services in 2014?* ***3)*** *Why was the information in the Tradewind Report, or the information and recommendations contained therein, not provided to Council or the public once the Tradewind Report was submitted to the Department of Engineering Services in 2014?* ***4)*** *Who, if anyone, was responsible for the failure to disclose a copy of the Tradewind Report, or the information and recommendations contained therein, to Council in 2014?* ***5)*** *Was there any negligence, malfeasance or misconduct in failing to provide the Report, or the information and recommendations contained therein, to Council or the public?* ***13)*** *Did anyone in the Public Works Office or Roads Department request, direct or conduct any other friction test, asphalt assessment, or general road safety reviews or assessments on the RHVP?* See Chapter 12 for the answers to these questions.

In response to Question 1, all of the individuals who received a copy of the Tradewind Report, and/or were advised of the Tradewind Report or its contents, after Mr. Moore received it in January 2014 until September 26, 2018, when Mr. McGuire located it, are listed in Chapter 12.

Questions 2, 3, and 4 address whether Council should have been made aware of the Tradewind Report when it was submitted to Engineering Services, why it was not provided to Council or the public, and who was responsible for the failure to disclose the Report to Council. There was no requirement in 2014 under the City's by-laws or policies to bring all consultant reports to Council. As the Tradewind Report did not indicate a matter of imminent concern but rather recommended a further investigation, there was no other obligation or best practice that required that Council be made aware of the Tradewind Report. As the sole recipient of the Tradewind Report, Mr. Moore was responsible for the non-disclosure of the Tradewind Report and its contents to Council as a result of his decision not to provide it to anyone other than Shillingtons.

The reasons why the Tradewind Report was not made known to Council during the period between Mr. Moore's receipt in 2014 and 2019 are more complicated. The reasons turn on why Mr. Moore did not provide a copy of the Tradewind Report to the Traffic group, which might have resulted in disclosure to Council in connection with recommendations of the Traffic group regarding traffic safety of the RHVP. Briefly summarized, Mr. Moore kept the Tradewind Report to himself for a number of reasons, which involve the interplay of the siloed structure of the Public Works department in respect of matters pertaining to the RHVP, in particular between Engineering Services and the Traffic group, and Mr. Moore's strongly held views regarding the state of the roadway, the role of Engineering Services in respect of traffic safety, and the merits of friction testing. In addition, while members of the Traffic group and their superiors either requested the results of the friction testing or spoke to Mr. Moore about the friction test results, the Traffic group did not press for a copy of the Tradewind Report and instead relied on Mr. Moore for an assessment of the friction testing results because they viewed pavement-related issues as falling within the purview of Engineering Services. If the Traffic group had pursued a copy of the Tradewind Report, the Tradewind results would have been available to Traffic and thus available to provide to CIMA and might have been disclosed to Council at some point prior to 2019 in connection with Traffic's recommendations for traffic safety.

The reader is directed to the answer to Question 3 in Chapter 12 for a more complete response to this question.

Question 5 asks whether there was any misconduct on the part of City staff in regard to the non-disclosure of the Tradewind Report. I conclude that Mr. Moore's failure to provide the Tradewind Report to the Traffic group for the purposes of its traffic safety mandate constituted misconduct as that term is understood for the purposes of this Inquiry, as set out above. Although it would have been preferable for staff in the Traffic group to have pressed Mr. Moore for a copy of the Tradewind Report, I have concluded that the failure of Traffic staff to do so does not rise to the level of misconduct for the reasons set out in Chapter 12. In addition, Mr. Moore provided inadequate, incomplete, or inaccurate information about the Tradewind Report and/or Tradewind's friction testing and the results thereof on three occasions to the PWC, Mr. Malone, and the media, as described in Chapter 12. I have further concluded that these actions also constituted misconduct.

For the purposes of Question 13, a complete listing of the friction tests (other than the MTO friction tests, the Tradewind Report, and the Golder Report), asphalt assessments, general road safety reviews, and other assessments of the RHVP prepared by Golder and CIMA from 2005 to 2020 is set out in Chapter 4 under the headings 4.6.3. and 4.6.4.

## The "Discovery" and Disclosure of the Tradewind Report

On September 26, 2018, Gord McGuire located an electronic copy of the Tradewind Report in the restricted Director's Office Folder in ProjectWise. The copy Mr. McGuire found was attached to the December 2015 Uzarowski Email that Mr. Moore had saved into this folder in May 2018. On September 26 or 27, either Mr. McGuire or his assistant Ms. Cameron subsequently located the 2014 Golder Report in the pile of documents that Mr. Moore had left while cleaning out his office in the lead-up to his retirement, as described above.

Questions 6, 7, 8, and 9 of the Terms of Reference address how the Tradewind Report was discovered and whether appropriate steps were taken to disclose the Tradewind Report and its contents once it was discovered.

The actions of the City staff can be divided into two periods:

- the period from September 26, 2018, when Mr. McGuire located the Tradewind Report and the 2014 Golder Report, until the City's receipt of a municipal FOI request for friction testing records (referred to in this Inquiry as "FOI 18-189" or the "FOI request") on November 8, 2018; and

- the period between the City's receipt of FOI 18-189 on November 8, 2018, and the presentations to Council at the Council meeting on January 23, 2019, and the GIC meeting on February 6, 2019, regarding the existence of the Tradewind Report and updates on various RHVP-related initiatives.

## Actions of City Staff Prior to Receipt of FOI 18-189[34]

Between September 26, 2018 and November 8, 2018, only a very limited number of individuals at the City knew about the existence of the Tradewind Report and the 2014 Golder Report. During that time, those aware of and responsible for considering its significance — Mr. McGuire for Engineering Services, Mr. Soldo for Roads & Traffic, and Mr. McKinnon as General Manager of Public Works — did little to progress their understanding of the content or significance of the Tradewind Report or the 2014 Golder Report.

When Mr. McGuire found the Tradewind Report and the 2014 Golder Report, he recognized that they were significant, insofar as the Tradewind Report contradicted Mr. Moore's past statements about friction testing on the RHVP. In particular, Mr. McGuire's takeaway was that the Tradewind Report was a report, not an "informal chart" as Mr. Moore had represented to the Hamilton Spectator.

Mr. McGuire asked Susan Jacob, the long-tenured Manager of Design (within Engineering Services) and a professional engineer, for her views. He also alerted Mr. McKinnon, who had a short conversation with Mr. Moore in early October from which Mr. McKinnon understood that Mr. Moore had not shared the Tradewind Report internally and that no further investigation had been completed. Mr. McGuire spoke to the City's Deputy City Solicitors, Debbie Edwards and Ron Sabo, in early October.

[34] These actions are described in Chapter 9.

They suggested that Mr. McGuire contact Mr. Moore for a better understanding of the circumstances pertaining to the Tradewind Report. Mr. McGuire did not do so until after receipt of the FOI request. Mr. McGuire also advised Mr. Soldo about his discovery of the reports and provided Mr. Soldo with a copy of the 2014 Golder Report with appendices, including the Tradewind Report, some time around October 10 to 15, 2018.

At some time prior to October 18, 2018, Mr. McGuire made the decision to abandon the HIR assessment and use a traditional mill and overlay method for the RHVP resurfacing. Although it is possible that the discovery of the Tradewind Report provided additional support for this decision, I do not find that this was the sole, or even primary, purpose for the decision. Rather, there was increasing evidence that HIR would not be feasible from a cost-benefit perspective. Mr. McGuire's decision meant the City could proceed to tendering and completing the RHVP resurfacing project in 2019.

The Tradewind Report raised questions that should have been obvious to City staff who read it, specifically whether the collision history of the RHVP — particularly the wet surface collision history — and the years of public and Council complaints could be attributable, at least in part, to the friction levels on the RHVP and whether the friction levels in 2018 posed a safety concern. The expert evidence provided to the Inquiry was that, in fact, friction levels on the RHVP had levelled off as of 2014. However, no one among City staff or its consultants knew this in the fall of 2018.

Prior to the receipt of FOI 18-189, Mr. McGuire and Mr. Soldo did not ask their staff about any prior knowledge of these reports or of any friction testing conducted on the RHVP. Nor did they seek any expert advice regarding the significance of the Tradewind Report and/or the need for any potential interim safety measures, including discussing the reports with Golder and CIMA, both of whom were already retained by the City in respect of several projects at that time. There are several reasons for this lack of action.

First, both Mr. McGuire and Mr. Soldo came to a quick conclusion that there were no immediate safety concerns raised in the Tradewind Report, and that the planned resurfacing on the RHVP satisfied the recommendation of remedial action and therefore addressed any traffic safety concerns raised by the Tradewind Report and the 2014 Golder Report. For his part, Mr. McKinnon relied on his directors' assessment.

Second, it appears that both viewed the other (and the other's division in Public Works) as responsible for considering the interplay of friction/pavement surface and roadway/traffic safety. Neither Mr. McGuire nor Mr. Soldo nor anyone else at the City had any expertise in friction testing methodologies and evaluation.

Third, Mr. McGuire and Mr. Soldo each had competing priorities in October and November 2018, relating to the RHVP and otherwise. Both had ongoing RHVP-related projects, some of which were anticipated to be reported to the PWC. Mr. McGuire was dealing with a response to Audit Services' VFM Audit, preparing to report to the PWC on the CIMA Lighting Study, and obtaining final reports on Golder projects related to the anticipated RHVP resurfacing (being the Golder Pavement Evaluation and the HIR Suitability Study). Mr. Soldo was preparing to report to the PWC on the results of the 2017 Annual Collision Report and the CIMA Speed Limit Study. His division was also working with CIMA on a project referred to as the "RHVP Roadside Safety Assessment", which had commenced in October 2018 (before Mr. Soldo received the Tradewind Report) to assess any upgrades for roadside devices to be implemented during resurfacing. Mr. McGuire and Mr. Soldo had also discussed preparing a joint report to the PWC requesting a functional assessment of the RHVP.

## Actions of City Staff After the Receipt of FOI 18-189[35]

FOI 18-189 requested any reports, memos, drafts, and correspondence about friction testing on the RHVP in the last five years and any reports, memos (including drafts), or correspondence about asphalt and/or pavement testing, assessments or plans on the RHVP in the last two years.

Both Mr. McGuire and Mr. McKinnon testified that they believed that the Tradewind Report would have to be presented to Council. However, it is not clear if, or in what form or detail, notification to Council would have occurred had Public Works not received FOI 18-189. However, as of November 8, 2018, receipt of the FOI request immediately forced the issue of whether, when, and how to disclose the existence of the Tradewind Report. Thereafter, it became an important priority of City staff to bring the Tradewind Report to Council's attention before the Tradewind Report was released to the FOI requestor and potentially made public.

[35] These actions are described in Chapter 10.

Between mid-November 2018 and early February 2019, the small circle of City staff who knew about and/or had a copy of the Tradewind Report expanded for this purpose. City staff in several departments and divisions — including Public Works, Legal Services, Communications, and the City Manager — devoted significant time to developing a collective presentation to Council regarding matters relating to the RHVP, including messaging pertaining to the Tradewind Report.

In mid-November and December 2018, Legal Services was engaged to assist with the FOI response, which was initially due in November 2018. In addition, upon learning of the Tradewind Report, Nicole Auty (City Solicitor, Legal Services, Finance & Corporate Services, Hamilton) and Mr. Sabo recognized, quite appropriately, that the existence of the Tradewind Report and its likely release in response to FOI 18-189 could have legal consequences for the City and retained David Boghosian (Managing Partner, Boghosian & Allen LLP) to complete "a general liability and risk assessment".

In preparation for the presentation to Council, each department or division concentrated on the matters that the leaders of those departments/divisions perceived to be within their mandate. The Inquiry's fact-finding mandate was challenged by the inability of many witnesses who testified before the Inquiry to describe the specific actions, decision-making, and discussions during this period. However, the evidence suggests that, although there were a number of meetings to jointly review the progress of the various presentations being put together, there was little actual collaboration in developing the content of these presentations.

From November 2018 to January 2019, Mr. McGuire and Mr. Soldo worked to prepare an update to the omnibus report regarding the RHVP and the LINC that the Traffic group had submitted in January 2018 (being Report PW18008), to be presented to the PWC, along with updates regarding other RHVP-related initiatives. Ultimately, this work was presented to Council in three public reports at the meeting of the GIC on February 6, 2019, which was the same meeting at which Council received its second briefing on the Tradewind Report.

To prepare these reports, Mr. McGuire and his staff were engaged in finalizing CIMA's Lighting Study report. Mr. McGuire also had discussions with Dr. Uzarowski about the results of the Golder Pavement Evaluation and the status of Golder's report, as well as certain aspects of the Tradewind Report (during which Mr. McGuire characterized

of the results as inconclusive", which Dr. Uzarowski challenged) and RHVP friction testing. Mr. Soldo focused on the RHVP Roadside Safety Assessment, the CIMA Speed Limit Study, the 2017 Annual Collision Report, and the preparation of staff reports on these items. Mr. McGuire and Mr. Soldo also gathered historic and current information regarding the RHVP from their staff.

Mr. McGuire and Mr. Soldo also attended meetings with Mr. McKinnon, Legal Services staff, Communications staff, and the City Manager regarding notification to Council about the Tradewind Report. To this end, Mr. McGuire and Mr. McKinnon obtained information from Mr. Moore in November 2018, which included Mr. Moore's view that the Tradewind Report was "inconclusive" because it applied a standard from the UK, that Mr. Moore had sought further interpretation of the results from Golder which was never provided, and/or that Mr. Moore had retained Golder to do the Golder Pavement Evaluation in 2017 in response to the Tradewind Report. Mr. McGuire and his staff also worked in this period to respond to the ongoing VFM Audit, including requests for RHVP-related documents.

In connection with the VFM Audit, Audit Services initially received a copy of the 2014 Golder Report that redacted all references to the Tradewind Report in the body of the 2014 Golder Report. The report was redacted at Mr. McGuire's direction on the advice of Legal Services due to concerns about the potential release of the document by Audit Services before staff had briefed Council. Audit Services ultimately obtained an unredacted copy of the 2014 Golder Report and the Tradewind Report on December 4, 2018. This reinforced the need to bring the Tradewind Report to Council's attention as quickly as possible.

However, as with the period prior to the receipt of FOI 18-189, Mr. McGuire and Mr. Soldo did not tell their staff about the Tradewind Report, retain the City's existing consultants or any new consultants for input, or otherwise conduct any analysis of the significance of the Tradewind Report for the traffic safety advice upon which the City had been acting, for the same reasons as during the September to November 2018 period set out above. In addition, they knew in December 2018 that Legal Services was obtaining a legal opinion regarding the Tradewind Report and was considering contacting CIMA. While Mr. McGuire apparently wanted to speak to Mr. Malone about the Tradewind Report in early December, a member of Legal Services advised him not to do so until the relationship between the City and CIMA had been finalised for

the purposes of the legal opinion. For his part, Mr. Soldo was of the view that if Legal Services was dealing with CIMA in respect of the Tradewind Report, he would not duplicate the effort, and he incorrectly understood that Mr. Malone was already aware of the Tradewind Report.

Legal Services had retained Mr. Boghosian for a general liability assessment and to identify countermeasures in his liability assessment that could be used as potential mitigating actions. At the outset of their discussions, Ms. Auty and Mr. Boghosian agreed that Mr. Boghosian would contact Mr. Malone of CIMA for background information. Contacting Golder was not discussed. Although Ms. Auty intended to maintain privilege over CIMA's opinion using Mr. Boghosian as an intermediary, Ms. Auty did not intend that this legal strategy would prevent or restrict communications between CIMA and Public Works staff. She expected, and incorrectly assumed, that CIMA was sharing the same information with Public Works. However, in reality, there were no meaningful discussions that occurred between Public Works staff and CIMA about the Tradewind Report.

Mr. Boghosian spoke to Mr. Malone on December 11, 2018, but did not provide a copy of the Tradewind Report to him. From this conversation, Mr. Boghosian understood that CIMA had already determined that the RHVP had a wet road friction problem, that the friction values "added nothing", and that the RHVP would be a safe road if the City implemented all the recommendations from the 2015 CIMA Report. As a result, Mr. Boghosian's legal opinion focused on mitigation of the City's liability to the extent that the City had not implemented all of CIMA's past recommendations, rather than on the recommendations of Tradewind and Golder for further investigation and/or remediation and the possible liability that could have flowed from a failure to follow Tradewind's or Golder's recommendations.

Ms. Auty and Mr. Sabo did not share Mr. Boghosian's written draft legal opinion with Public Works staff upon their receipt of it on December 13, 2018. Ms. Auty did, however, pass on Mr. Boghosian's advice to implement all of CIMA's outstanding recommendations immediately.

## The Briefing of Council[36]

After alerting Mayor Fred Eisenberger about the Tradewind Report on December 18, 2018, City staff worked to gather information to bring to Council, which would subsequently be made available to the public, as Mayor Eisenberger had advised. Mayor Eisenberger's advice was premised on his understanding from staff that there were no safety issues on the RHVP.

### *The January 23, 2019 Council Meeting*

On January 23, 2019, Ms. Auty briefed the Mayor and members of Council about the existence of the Tradewind Report during a closed session of Council. This briefing occurred nine days after Mr. McGuire submitted Engineering Services' response for FOI 18-189 to the City's Access & Privacy Office on January 14, 2019. Once delivered, City staff no longer had control over the possible disclosure of the Tradewind Report or the 2014 Golder Report, or the timing thereof.

The briefing on January 23 was intended to be a "heads up" notice to Council. Staff were also planning a more comprehensive presentation on the Tradewind Report for Council and had several topics to report to the PWC regarding outstanding RHVP-related matters, all of which were ultimately consolidated into a presentation to the GIC on February 6, 2019.

Ms. Auty's confidential briefing report for the January 23 Council meeting contained a brief historical background of the RHVP and the Tradewind Report, a brief summary of Mr. McGuire's "discovery" of the Tradewind Report (which was described as "draft"), and the 2013 friction testing, as well as a brief summary of its results, including that the RHVP results fell "below or well below the relevant UK standard". The report identified several concerns associated with the Tradewind Report, including the lack of any prior distribution to City staff and inconsistent media statements made in the past, as well as the related reputational impact. It did not summarize Tradewind's recommendations, attach a copy of the Tradewind Report, or reference the 2014 Golder Report.

[36] These actions are described in Chapter 11.

The Inquiry received limited evidence regarding what, if anything, was reported or discussed during the closed session on January 23, beyond the content of Ms. Auty's written report. However, the Inquiry received evidence that Mr. McKinnon provided assurances to Council during the closed session that the RHVP was safe.

The evidence before the Inquiry suggested that Council had several questions and action items for staff to address that involved the obvious questions arising from the "discovery" of the Tradewind Report. Broadly speaking, these were: (1) whether CIMA or Mr. Malone had a copy of the Tradewind Report; (2) whether or how CIMA's recommendations would have changed with the benefit of the Tradewind Report; and (3) whether CIMA recommended any interim measures to address safety on the RHVP pending resurfacing. The issue of the implications of the Tradewind test results for the safety on the RHVP, both in and of themselves and as part of a larger assessment of the factors contributing to the accident experience on the RHVP, should have been addressed by Public Works before this time, but had not been.

*Preparation for the February 6, 2019 GIC Meeting*

The next briefing of Council occurred at a meeting of the GIC on February 6, 2019. In the period between January 23 and February 6, City staff took several steps to respond to Council's questions and prepare for the subsequent briefing, including finalizing the presentation materials and the preparation of a further report by Ms. Auty, which became Report LS19010: Roads Infrastructure Litigation Review and Assessment. In addition, on January 31, 2019, Mr. McKinnon, the City Manager and the Executive Director of Human Resources met with Mr. Moore to obtain further information about the RHVP and various matters pertaining to friction testing on the RHVP. The information Mr. Moore provided in response was vague and self-serving, perhaps not surprisingly in the circumstances.

More significantly, following the January 23 Council meeting, Ms. Auty, through Mr. Boghosian, retained CIMA to advise on Council's questions. Although Mr. Malone of CIMA had discussed RHVP friction testing in varying degrees of detail and in varying contexts with Mr. Moore, Mr. McGuire, Mr. Soldo, and Mr. Boghosian in the past, he did not actually learn with clarity about the existence of the Tradewind Report until he participated in a telephone call between several City staff members of Legal Services, Public Works, and Communications, and Mr. Boghosian on January 30, 2019.

Following this call, Mr. Malone agreed to prepare a memorandum response to three questions (the "February 4 CIMA Memorandum"). Mr. Boghosian provided Mr. Malone with a copy of the Tradewind Report and the 2014 Golder Report. In the days that followed, and on a compressed timeframe and in circumstances of considerable pressure, Mr. Malone prepared the February 4 CIMA Memorandum. The February 4 CIMA Memorandum was provided to the GIC on February 6, 2019, as an appendix to Legal Services' Report LS19010.

The February 4 CIMA Memorandum summarized CIMA's review of the 2014 Golder Report and the Tradewind Report. CIMA did not recommend closure of the RHVP prior to the completion of the RHVP resurfacing. It concluded that the information in the 2014 Golder Report (including the Tradewind Report) did not require any changes to CIMA's recommendations in CIMA's previous reports to the City regarding safety on the RHVP. It noted, however, that if CIMA had the Tradewind Report prior to completing the 2015 CIMA Report, CIMA would have adjusted its friction testing recommendation to urge "further investigation of the friction findings in the 2014 Golder Report, relating to road design and operations" and modified its past recommendation to conduct speed enforcement to "increased" or "enhanced" speed enforcement until the resurfacing. The February 4 CIMA Memorandum was not a comprehensive review of traffic safety on the RHVP in light of the Tradewind test results nor could it have been in the time that was available to CIMA to complete this assignment. As described in detail in Chapter 12, in my view, the CIMA February 4 Memorandum had some limitations that diminished its usefulness.

*The February 6, 2019 GIC Meeting*

Council received a second, much lengthier and more detailed briefing from staff about the Tradewind Report, the state of the RHVP, and the City's proposed communications strategy in respect of the Tradewind Report at an over 13-hour long meeting of the GIC on February 6, 2019. The meeting began with an open session and then moved into an in camera closed session that lasted for nearly six hours, during which staff presented a four-part presentation related to the Tradewind Report. The GIC meeting moved back into open session at the end of the closed session. At the end of the second open session, the Tradewind Report was released publicly.

Staff presented a significant amount of information about or related to the RHVP and the Tradewind Report at the GIC meeting on February 6. During the lengthy closed session, staff presented two confidential reports: Legal Services' Report LS19010, which appended the February 4 CIMA Memorandum and Audit Services' Report AUD19002: Roads Audit Update. Staff also provided Council with copies of two confidential documents: a communications plan summary and a preliminary reconstructed timeline of RHVP-related events between July 2006 and mid-January 2019. Staff's four-part presentation in the closed session, which was accompanied by a confidential slide deck presentation, was as follows:

1) A presentation by Mr. McKinnon on the timeline and technical concerns;

2) A presentation by Charles Brown (Auditor General, Office of the City Auditor (Audit Services), City Manager's Office, Hamilton) on Audit Services' investigation, which included information about how the Tradewind Report came to Audit Services' attention during the VFM Audit;

3) A presentation by Ms. Auty and Mr. Boghosian on the legal considerations, understood to have been divided into a claims review presented by Ms. Auty and a liability review presented by Mr. Boghosian. Mr. Boghosian's written legal opinion was not given to Council, but I understand that Council was orally walked through that opinion; and

4) A presentation by John Hertel (Director, Strategic Partnerships & Communications, City Manager's Office, Hamilton) setting out staff's recommended internal and external communications strategy related to the Tradewind Report.

The information that the GIC received in the materials ranged from the historical context of the RHVP's construction, prior safety improvements implemented by staff, plans for future improvements to the RHVP (including resurfacing), technical information about roadway friction, and the existence of the Tradewind Report.

Although the Inquiry received evidence from many attendees at this meeting, most witnesses had limited recollections about the substance of staff's presentation (beyond what was set out in the slide deck), what questions members of Council asked, and/or staff's answers. Some witnesses also had difficulty distinguishing this meeting from

prior and subsequent Council meetings. Consequently, the Inquiry had limited insight into the substance of the discussions during the closed session on February 6.

In the second open session, which followed the lengthy closed session, Mr. Soldo and/or Mr. McGuire presented three Public Works reports in under 15 minutes, with little discussion:

- Report PW19012: City of Hamilton Annual Collision Report - 2017, which reported on City collision data, including data specific to the RHVP, from 2013 to 2017. The 2017 Annual Collision Report, which Mr. Soldo submitted, was the first network-wide collision data published by the City since 2010;

- Report PW19014: Speed Limit Reduction Feasibility Study on the Lincoln M. Alexander and the Red Hill Valley Parkways, which Mr. Soldo also submitted, and which recommended a reduction in the speed limit (from 90 km/h to 80 km/h) for a portion of the RHVP between the Greenhill Avenue interchange and the QEW, contrary to CIMA's recommendation to maintain the existing posted speed in the Speed Limit Study; and

- Report PW18008A: Lincoln M. Alexander Parkway (LINC) and Red Hill Valley Parkway (RHVP) Transportation and Safety Update, submitted jointly by Mr. McGuire and Mr. Soldo, which addressed, among other topics, the RHVP Roadside Safety Assessment, the Lighting Study, the testing performed by Golder in the Golder Pavement Evaluation, the upcoming RHVP and LINC resurfacing, and the implementation status of countermeasures on the RHVP since 2015.

In my view, there were several issues in the written presentation and the related materials that deserve comment, which I provide with the caveat that I could not confirm whether staff provided additional information during the oral presentations provided in the closed session. In summary:

- Read collectively, the core message in the three Public Works reports presented in the open session was that driver behaviour was the primary cause of collisions on the RHVP. In my view, the Public Works materials before the GIC which, unlike the other confidential materials, were accessible to the public did not provide a full and complete picture of the factors contributing to

collisions on the RHVP, particularly under wet surface conditions, or the role that these factors, including inadequate skid resistance, played regarding the collision experience on the RHVP. In this respect, it was noteworthy that the three staff reports submitted by Public Works did not provide any information at all regarding the wet surface collision history on the RHVP identified by CIMA in CIMA's recent reports (which were referenced in Reports PW19014 and Report PW18008A) and only included a short reference in Report PW19014 to the significance of the geometry of the parkway.

- The confidential materials provided by Legal Services and Communications staff, including the four-part slide deck presentation, appear to have focused primarily on the legal and reputational concerns posed by the release of the Tradewind Report through the FOI process and Mr. Moore's failure to distribute it, rather than the Tradewind Report's contents and/or the existence of any safety concerns. In this regard, it is also noteworthy that the only staff reports to Council that dealt specifically with the Tradewind Report were the two reports of Legal Services (presented on January 23 and February 6).

The restriction of the discussion regarding the Tradewind Report to the closed session reflected the fact that Public Works and Legal Services continued to approach the issues regarding the Tradewind Report narrowly as confidential legal issues.

Contrary to staff's recommended communications strategy to release the Tradewind Report one week later, after a subsequent Council meeting, Council directed staff to release the Tradewind Report to the public in the evening of February 6, 2019, together with a public apology to Council and the public regarding the Tradewind Report and the manner and timing of its disclosure. The City media release included staff's apology and provided a high-level overview of the information that had been presented to the GIC that day. The media release appended the Tradewind Report and the February 4 CIMA Memorandum. In addition, Council passed several resolutions on February 6, including a by-law to implement the reduction of the posted speed limit to 80 km/h on the portion of the RHVP between the Greenhill Avenue interchange and the QEW.

Shortly after the Tradewind Report was disclosed publicly, City staff learned for the first time of the MTO friction testing on the RHVP between 2008 and 2014. At the time

the Tradewind Report was discovered and disclosed, City staff were unaware of this post-2007 MTO friction testing or the test results.

The RHVP was resurfaced in the spring/summer of 2019. Further friction testing using a locked-wheel tester (the same type of equipment used by the MTO) was conducted by Applied Research Associates, Inc. ("ARA") prior to, and after, the RHVP was resurfaced. Englobe Corp. ("Englobe") also conducted further friction testing on the RHVP using a GripTester (the same type of equipment used by Tradewind) prior to the resurfacing.

In addition, the City made changes to its processes and policies following the public disclosure of the Tradewind Report in February 2019 and during the period of the Inquiry's work. These changes relate to, among other things, document control and retention, the working relationship between City staff and councillors, the City's Code of Conduct for staff, and a committee of senior Public Works leadership to coordinate staff's work on the RHVP and the LINC.

## Answers to Terms of Reference Questions 6, 7, 8, and 9

My detailed conclusions and answers to Questions 6, 7, 8, and 9 of the Terms of Reference are set out in Chapter 12.[37]

Question 6 asks how the Tradewind Report was discovered in 2018. The circumstances under which Mr. McGuire located the Tradewind Report in a ProjectWise folder on September 26, 2018 are set out above.

In response to Question 7, all of the individuals who received a copy of the Tradewind Report and/or were advised of the Tradewind Report or the information and

[37] Questions 6 to 9 ask: ***6)*** *How was the Tradewind Report discovered in 2018?* ***7)*** *Identify all individuals who received a copy of the Tradewind Report or were advised of the Tradewind Report or the information and recommendations contained therein, in 2018.* ***8)*** *Were appropriate steps taken to disclose the Tradewind Report, or the information and recommendations contained therein, once it was discovered in 2018?* ***9)*** *Was there any negligence, malfeasance or misconduct in failing to disclose the Tradewind Report, or the information and recommendations contained therein, once the Tradewind Report was discovered in 2018?*

recommendations contained therein in 2018 after Mr. McGuire located the Tradewind Report are listed in Chapter 12.

Questions 8 and 9 ask whether appropriate steps were taken to disclose the Tradewind Report to Council after it was discovered in 2018 and whether there was any misconduct in failing to disclose the Tradewind Report after such discovery.

I find that none of the City staff involved in the preparation of the notification to Council about the Tradewind Report engaged in misconduct, as that term is understood for the purposes of this Inquiry, or in improper or unprofessional behaviour. Nor do I think that the actions of any of the individuals involved in the presentations to Council constituted bad management.

However, the absence of a joint effort to respond collectively to all of the possible implications of discovery of the Tradewind Report, ineffective communication among those involved, and the compressed timeframe had the result that there was no analysis of any significance on a central issue — the implications, if any, of the Tradewind Report for the present and future operating conditions on the RHVP and, more specifically, whether the traffic safety measures put in place over time were appropriate and sufficient — apart from the observation that the resurfacing would cure any deficient friction levels.

This issue was not addressed until Council raised its questions at the Council meeting on January 23, with the result that CIMA could not comprehensively address the issue in the February 4 CIMA Memorandum in the limited time available to it. In addition, while I accept that the staff involved in the written presentations to Council legitimately sought to be open and transparent with Council and the public, Council could have been provided with more information in the written materials to understand more comprehensively the factors contributing to accidents on the RHVP. This conclusion is, however, based solely on the written presentations as the Inquiry received only limited testimony regarding the content of the discussions in the closed sessions of Council and the GIC. The reader is referred to the full answer in Chapter 12, and the facts in Chapters 10 and 11, for a more complete understanding of my answers and of the limitations attached to them based on the evidence before the Inquiry.

# What We Know About the RHVP as a Result of the Inquiry

This section summarizes my findings and conclusions in Chapter 12 regarding the technical issues around RHVP pavement friction and safety based on the information that was available to the Inquiry. It is important for the reader to review the detailed findings in Chapter 12 to understand and appreciate the many nuances underpinning this summary.

## The RHVP's Overall Collision Rates Were Higher Than Provincial Averages

The RHVP average weighted collision rate, counting all collisions (police reported and self-reported), was significantly higher than the collision rates on comparator provincial highways. In January 2019, CIMA concluded that the RHVP's average weighed collision rate was 1.01 collisions per million vehicle-kilometres travelled, whereas the rates were lower on the four provincial freeways CIMA selected as comparators: Highway 403 (0.81); Highway 406 (0.78); Highway 7/8 (0.66); and Highway 8 (0.70).

## The RHVP Had "Hot Spot" Sections

Elements of the RHVP geometry make the roadway challenging to drive, particularly in the area between the Greenhill Avenue and Queenston Road interchanges, which requires a higher friction supply in order to execute maneuvers in that area. Consistent with that evidence, the locations with the highest collision frequencies were located within, on approach to, or leaving horizontal curves, particularly in that segment of the RHVP.

## The RHVP Had An Abnormally High Proportion of Wet Road Collisions

The various experts who gave evidence before the Inquiry differed somewhat on what constitutes a "typical" wet road collision proportion, but there is no question that

the proportion of wet road collisions on the RHVP compared to total collisions was abnormally or disproportionately high compared to the expected norms.

## RHVP Friction Levels Declined from 2007 to 2014, Then Levelled Off (Answers to Terms of Reference Questions 14 and 16)

As discussed above, the MTO October 2007 friction test results were good for new SMA prior to opening to traffic, where it was predictable that friction would be low initially and increase in a matter of weeks or months after opening to traffic. In addition, while the results were not high, objectively speaking, they were much better than other brand new SMA pavements that the MTO had tested which had had early low age friction issues that resolved quickly.

Question 16 asks whether the 2007 MTO testing provided additional support or rebuttal to the conclusions of the Tradewind Report.[38] It provided neither. The condition of the RHVP pavement surface at the time of the Tradewind testing in 2013 was different from that at the time of the 2007 MTO testing. The frictional performance in October 2007 prior to opening was distinct from, and cannot be compared to, the parkway's frictional performance six years later in 2013 when tested by Tradewind.

Question 14 asks whether any consultant reports prepared after the Tradewind Report provided additional support or rebuttal to the conclusions contained in the Tradewind Report.[39]

The MTO 2008 results disclosed that the friction levels had increased following the October 2007 MTO testing, and after exposure to traffic.

However, the MTO results from 2009 to 2014 (excluding 2013 when testing did not occur) disclosed a decrease in the friction levels in each year thereafter. By 2014, the MTO results were approximately 20% lower than measured in 2008. The Tradewind

[38] Question 16 asks: ***16)*** *Did the MTO Report provide additional support or rebuttal to the conclusions contained in the Tradewind Report?*

[39] Question 14 asks: ***14)*** *Did subsequent consultant reports provide additional support or rebuttal to the conclusions contained in the Tradewind Report?*

friction test results, obtained in November 2013, along with the ARA and Englobe pre-resurfacing friction test results in May 2019, each confirm that the reduction in friction had levelled off after 2013/2014.

The 20% decline in friction disclosed by the MTO results was not unusual over a period of six years and was consistent with an expected amount of polishing of the aggregate used in the SMA surface course due to wearing from traffic. However, the reduction, while not unexpected, was "significant" because the starting point friction levels in 2008 were not particularly high to begin with.

I note as well that the various CIMA reports prepared after the Tradewind Report, even though prepared in ignorance of the Tradewind Report, contained collision history statistics and analysis suggesting that low friction might be a contributing factor to the accident experience on the RHVP, all of which provided additional support for the Tradewind Report test results and its conclusion that further investigation was necessary.

## "Relatively Low" RHVP Friction Levels Were a Likely Contributor to Collisions

As a general matter, as mentioned above, deficient friction is seldom the sole or principal cause of accidents on an expressway. In any event, the Inquiry has seen nothing to suggest that the friction levels on the RHVP were so low that friction in and of itself was a cause of accidents in the absence of other contributing factors.

However, by 2013/2014, the skid resistance levels on the RHVP were "relatively low". The fact that parts of the roadway are challenging to drive makes the friction supply required to meet that friction demand more important than in other situations. In that context, the RHVP's "relatively low" friction presented a problem that might not be present on other less challenging highway segments, particularly, but not exclusively, when the pavement surface was wet. As Dr. Flintsch testified, while the friction supplied by the SMA pavement was not inordinately low, it was low relative to the friction demanded by the geometric features of the RHVP.

The evidence before the Inquiry established that, at least with respect to accidents under wet surface conditions, inadequate skid resistance or friction was a contributing factor to accidents on the RHVP, in concert with other factors.

Ultimately, the extent that friction levels on the RHVP might have been a possible contributing factor to collisions even under dry surface conditions prior to 2019 cannot be definitively established. However, in general, skid resistance affects both wet and dry road collision rates, with both rates increasing as friction decreases, although the effect is greater on wet surfaces. In my view, the preponderance of the evidence regarding the other contributing factors to the accident experience on the RHVP, including not only the geometric features but also the location of the interchanges and ramps, as well as the relationship between the design speed and the posted speed, supports this conclusion.

None of this is to say that low friction was a contributor to any individual collision. A full collision reconstruction is necessary to reach a conclusion as to the cause(s) of any individual collision.

## Many Factors Contributed to Collisions on the RHVP (Answer to Terms of Reference Question 24)

Question 24 raises the question of the universe of factors that contribute to accidents on the RHVP.[40]

As noted above, there is ample evidence that friction levels were a contributing factor generally to collisions on the RHVP, and especially on wet pavement. However, there are many potential contributing factors to collisions and other accidents on a roadway which, in general, can be broken down into three categories: factors related to the highway conditions, factors related to the vehicles involved, and factors related to the driver(s) involved.

[40] Question 24 asks: ***24)*** *To what extent do other factors, including, but not limited to, driver behaviour, lighting and weather conditions, contribute to motor vehicle accidents when compared to the impact of friction levels on motor vehicle accidents on the RHVP?*

It is well documented in the transportation industry that the motorist is the primary contributor to collisions in the road-vehicle-motorist system, while it is estimated that road design, operations, and maintenance are a contributing factor in approximately one quarter of motor vehicle collisions. Road users operate within an environment, and they operate better and make better or error-free decisions when the roadway in front of them is consistent with what they expect for that type of facility. Within a particular road section, the design, the operations, the line markings, and the signage, among other factors, ought to be relatively consistent for like situations. Roadway infrastructure must be designed, operated, and maintained so that motorists understand the system they are using and will make rapid and appropriate decisions in selecting speed and path. Consistency and uniformity of design standards is a primary means of facilitating motorist comprehension, expectancy, and prudent decision making.

As noted above, on the RHVP, several interrelated factors contributed to collisions in addition to the friction levels. These included the geometry (tight sequential curves, short weaving areas, and closely spaced interchanges) and operating speeds that regularly exceeded the design speed of 100 km/h, given that the posted speed was 90 km/h until the partial reduction approved by Council in 2019. Essentially, the relatively low friction reduced the margin of error that drivers had in challenging areas of the RHVP, which made the roadway less forgiving of driver speed and error, particularly under wet surface conditions. This evidence was supported by the opinions of CIMA expressed in the 2015 CIMA Report, the Lighting Study, the RHVP Roadside Safety Assessment, and the February 4 CIMA Memorandum.

The evidence before the Inquiry did not, however, support a ranking among these factors. With the breadth of evidence the Inquiry heard, the primary point that bears repeating is that none of the factors that contribute to collisions can be taken in isolation. Rather, the combination of geometry, the posted speed, road surface conditions, friction levels, and driver expectations that the RHVP functions like a 400-series highway are all potential contributing factors to collisions on the RHVP.

# The Impact of The Non-Disclosure of The Tradewind Report on RHVP Safety (Answers to Terms of Reference Questions 10, 11, and 12)

Questions 10, 11, and 12 of the Terms of Reference address the impact of the non-disclosure of the Tradewind Report.[41] These questions require consideration of the consequences of the non-disclosure of the Tradewind Report at the time of its receipt in January 2014.

The principal significance of Mr. Moore's retention of the Tradewind Report was that the Traffic group and its consultant, CIMA, did not have the benefit of the findings and recommendations in the Tradewind Report after 2014. The question is therefore what could reasonably have been expected to happen if Traffic had in fact received the Tradewind Report and the 2014 Golder Report in 2014. The answers to these questions are therefore, by their nature, speculative. I address these questions based on the following framework.

The Tradewind Report was credible; its contents and its recommendation for further investigation should have been taken seriously. The Tradewind Report did not identify an urgent concern, whether relating to pavement condition or traffic safety, but it did identify a condition that could, under some circumstances, be a contributing factor to collisions, particularly under wet surface conditions. Its findings not only required a further investigation but also called into question the simple explanation of bad driver behaviour that was provided to the PWC and Council as the reason for the abnormal accident experience on the RHVP.

Significantly, both the Tradewind results and the CIMA analysis in the 2015 CIMA Report suggested that friction levels on the roadway could have been a contributing

[41] Questions 10 to 12 ask: ***10)*** *Did the Tradewind Report contain findings or information that would have triggered Council to make safety changes to the roads or order further studies?* ***11)*** *Were users of the RHVP put at risk as a result of the failure to disclose the Tradewind Report's findings?* ***12)*** *Did the failure to disclose the Tradewind Report, or the information and recommendations contained therein, contribute to accidents, injuries or fatalities on the RHVP since January, 2014?*

factor to the accident experience on the RHVP. If Traffic had received the Tradewind Report, it would not have been possible to attribute that collision experience exclusively to bad driver behaviour, even if the friction levels that it revealed were not, in and of themselves, the cause of collisions. Recognition of this possibility would have prompted the Traffic group to look more broadly at the issue and to develop a more comprehensive view of the factors that were contributing to the collision experience on the RHVP in 2014. Given the pre-existing elements of the geometry of the RHVP, the weaving distances associated with the location of the ramps and interchanges, and the separation between the posted speed and the design speed, among other factors, Traffic would have had to address the question of whether the interaction of the friction levels on the RHVP with these other factors could have been an explanation for the wet surface accident experience in particular.

It is reasonable to conclude that, if the Traffic group had received the Tradewind Report, this group would have conducted a further investigation of the roadway surface including the friction levels on the RHVP as recommended by Tradewind. This would have provided a clearer assessment as to whether the pavement surface friction levels were a contributing factor to collisions on the RHVP. It may have included further friction testing, or more targeted testing on the RHVP's hot spots. I have no doubt that Council would have authorized any study or investigation that staff recommended given the ongoing engagement of the PWC on RHVP traffic safety matters, and the public attention paid to the collision experience on the RHVP.

The City's consultants — Golder and CIMA — canvassed many types of possible countermeasures with their staff contacts in Public Works over time, some of which were implemented, and others which were not, for various reasons. If the Traffic group had received the Tradewind Report and the 2014 Golder Report and had conducted further investigation, they would have been more fully informed about all the countermeasures available to the City and would have been in a position to consider them meaningfully.

However, I cannot speculate on whether City staff would have recommended adoption of specific countermeasures recommended by CIMA that were not implemented between 2014 and 2019, or any of Golder's recommendations. Many of these options would have been costly, and would have taken time, to implement (for example, rehabilitation of the surface and installation of median barriers). It is impossible to

assess in hindsight the factors that would have gone into a decision on any of such options including the results of the necessary cost-benefit analysis.

However, with respect to the countermeasures recommended by CIMA that were actually implemented in the period between 2014 and 2019, I think it is reasonable to assume that if Traffic had adopted a more comprehensive approach to traffic safety, Traffic would have recommended to Council that those countermeasures be implemented earlier than actually occurred. In particular, I think that it is reasonable to assume that Traffic would have recommended a reduction in the posted speed limit on the RHVP and enhanced speed enforcement earlier than 2019. I also think that it is reasonable to assume that Traffic would have recommended implementation of those countermeasures that were tied to the resurfacing schedule of Engineering Services, in particular the installation of permanent raised reflective markings, on an independent and earlier basis.

Due to the COVID-19 pandemic and its effects on traffic patterns, it was not possible to draw reliable conclusions regarding collision trends after 2019 following the reduction of the posted speed limit, the commencement of enhanced speed enforcement, and the resurfacing of the RHVP, which otherwise could have demonstrated whether these actions did, in fact, result in a reduction in collisions. This will only be possible when the City has an appropriate data set of post-2021 collision statistics available for expert analysis. In addition, dealing specifically with respect to fatalities, the limited number of such incidents makes it impossible to draw statistically meaningful conclusions.

However, to the extent that the earlier implementation of the countermeasures described above would have decreased the demand for friction on the RHVP, the expert evidence established that decreasing the demand for friction will decrease the number of collisions, injuries, and deaths, even if it is not possible to quantify the effect. Accordingly, it is logical to assume that the failure to disclose the Tradewind Report, or the information and recommendations contained in the Report, resulted in users of the RHVP being exposed to more risk than would have been the case if those countermeasures had been implemented earlier. For the same reason, it is also logical to assume that the failure to disclose the Tradewind Report contributed to accidents and injuries on the RHVP since January 2014.

# Summary of Recommendations

In Chapter 12, I set out Recommendations in response to the questions I was directed to answer in the Terms of Reference. These Recommendations are informed by my findings, overall conclusions, and the answers to the Terms of Reference set out in Chapter 12 and in earlier chapters.

The City's resolution directing this Inquiry included a direction to make recommendations appropriate and in the public interest as a result of the Inquiry, including in Question 15 of the Terms of Reference, to identify any changes to the City's by-laws, policies, and procedures to prevent any future incidents of non-disclosure of significant information to Council. The Recommendations focus on the structural and systemic issues that are identified in this Report.

My recommendations are directed to the City of Hamilton, but many of the matters raised in the Terms of Reference are relevant to municipal governance generally and maintenance of municipal expressways specifically.

Many of the matters addressed in my Recommendations have been addressed in the reports and recommendations of previous inquiries. Where appropriate, I repeat and reiterate guidance from previous inquiries in my Recommendations. In particular, I have emphasized the need for leadership and education in establishing and maintaining a culture of collaboration, cooperation, transparency, and accountability for Council, staff, and the public. Such a culture is fundamental to good government at the local level.

I am aware that the City has made changes to its practices, policies, and procedures since 2019, and that some of these changes may address issues discussed in this Report and highlighted in the Recommendations. My Recommendations, however, are rooted in the Terms of Reference and respond to the policies, procedures, and events set out in the Terms of Reference that were in effect prior to and as of 2019. Nothing in this Report should be viewed as an express or implied criticism of the City's subsequent efforts to improve its policies, practices, and procedures.

The Recommendations are set out in full in Chapter 12 and cover several different matters. As a summary, the principal categories of Recommendations are as follows.

First, the Public Works department should treat traffic safety on the RHVP and the LINC as a shared responsibility of all members of the department. The Recommendations suggest certain mechanisms to reinforce this joint responsibility.

Second, given the collision history on the RHVP, and the fact that the collision experience will necessarily change over time, Public Works should adopt processes for a comprehensive safety approach similar to the approach of the regional offices of the MTO to monitor and address traffic safety issues that arise on the RHVP and the LINC. My Recommendations relate to both expressways as they form one continuous roadway that should be managed as a whole. The Recommendations identify certain elements of such an approach to traffic safety.

Third, the Recommendations address the need to develop a real culture of collaboration and cooperation between departments and divisions of Public Works that have overlapping responsibilities.

Fourth, the Recommendations address the need for the Public Works department to enable information sharing among members of the department, including the establishment of a library of all consultant and third-party reports, staff reports, collision statistics, and analyses, among other things, and a formal project tracking system for any matter involving multiple divisions within Public Works.

Fifth, in view of the issues raised in respect of staff reports to Council, it is recommended that certain actions be taken to ensure better and more consistent reporting to Council. The recommendations also suggest policies regarding the preparation of staff reports to ensure objective and comprehensive reports to Council and its committees.

Similarly, in view of the issues raised regarding statements to the media and the public, it is recommended that certain steps be taken to ensure accurate disclosure to the media and the public and the correction of any inaccurate disclosure.

Lastly, the Recommendations address a number of issues respecting third-party consultant engagements and the preparation of consultant reports and the companion staff reports to ensure that the respective roles of consultants and City staff are respected.

# Conclusion

This Inquiry effectively began in the late spring of 2019. Its Terms of Reference required an investigation of the relevant facts pertaining to the design and construction of the RHVP, traffic safety reviews and friction testing conducted since the opening of the RHVP in November 2007, the manner in which the Public Works department oversaw roadway and traffic safety on the RHVP during that period, and the actions of City staff in respect of, and following, discovery of the Tradewind Report in September 2018.

As set out in Chapter 13, the investigation phase, which went to April 2022, took longer than anyone anticipated or wanted. Broadly drafted terms of reference have significant consequences for the scope and process of an inquiry, as was the case in this Inquiry. This, in turn, affected the length and cost of the Inquiry, as did the City's approach on issues of document production and privilege assertions which are detailed in Chapter 13. In addition, the occurrence of the COVID-19 pandemic created challenges for the participants, especially the City.

The public hearings provided a comprehensive airing of the issues relevant to the Terms of Reference, which is the goal of public inquiries. It is my hope that the technical and expert evidence and my overall findings in this Report will contribute to a better understanding of the design, construction, and operating history of the RHVP and thereby provide some clarity to the City, those who have been personally affected by accidents on the RHVP, and the Hamilton public generally.

As noted above, as an investigation completed in a public forum, a public inquiry requires flexibility, creativity, and adaptiveness to achieve a fair process that is transparent and balances thoroughness with efficiency. Through the commitment of Commission Counsel, the participants, and the participants' counsel, and all those involved in the Inquiry process, I trust we have met these goals.