CLOSING SUBMISSIONS OF HIS MAJESTY THE KING IN RIGHT OF ONTARIO TO THE RED HILL VALLEY PARKWAY INQUIRY

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INTRODUCTION

1. His Majesty the King in right of Ontario ("Ontario"") looks forward to receiving the Commissioner's findings in respect of the issues to be decided in the Inquiry. Ontario is committed to engaging in discussions about the Commissioner's recommendations, particularly on matters of Provincial interest.

2. Ontario's Ministry of Transportation ("MTO" or the "Ministry") is responsible for managing the Provincial highway corridor network. Municipalities have their own road infrastructure for which the Ministry is not responsible. The Red Hill Valley Parkway ("RHVP") is a municipal roadway located within the City of Hamilton ("City").

3. Although Ontario provided historical funds[1] to the City of Hamilton ("the City") for RHVP-related purposes, Ontario did not have any responsibility or approval functions in respect of the design or construction of the RHVP,[2] which were responsibilities of the City.[3] Ontario has no responsibility for the operation or maintenance of the RHVP, which is also the responsibility of the City.

4. The MTO is the only department of the Provincial government that has been involved in the Inquiry proceedings. Its involvement was primarily to provide evidence on the results of the RHVP friction testing conducted by the MTO as a courtesy for the City in 2007 ("2007 results"

[1] MTO0000086 (MTO Red Hill Creek Expressway / QEW Improvements Memo); On March 31, 2005, the MTO paid the remaining $50.62 million of its $106.75 million RHVP funding commitment to the City and the 1998 legal agreement was terminated on March 31, 2005.
[2] RHVPI Transcript dated May 10, 2022, Day 2 Evidence of Gary Moore (City of Hamilton Director of Engineering Services, Public Works) ("**Moore Transcript 2**"), p 1796 (lines 4-25) – p 1797 (lines 1-25); Historical agreements: HAM0051118_0001 (Exhibit 37: MTO-Hamilton-Wentworth Red Hill Creek Expressway Program); HAM0018501_0001 (Exhibit 38: MTO-Hamilton-Wentworth October 1997 Funding Agreement Proposal); HAM0007237_0001 (Exhibit 39: MTO-Hamilton-Wentworth August 2000 Amendment Agreement); HAM0007235_0001 (Exhibit 40: MTO-Hamilton-Wentworth October 1998 Amendment Agreement).
[3] Moore Transcript 2, p 1801 (lines 8-11).

herein, or the "MTO Report" in the Terms of Reference).[4] MTO witnesses provided evidence about their assessment of the 2007 results against MTO's own friction testing standards and practices, and their related conduct including their diligent distribution of the 2007 results.

5. The Commissioner has also been asked to determine whether the MTO conducted any other friction tests, asphalt assessments or general road safety reviews on the RHVP. During the Inquiry, MTO witnesses spoke to their assessment of an application for inclusion of the underlying aggregate on the Province's Designated Sources of Materials ("DSM") list, which was submitted by the Quebec quarry that produced the aggregate used on parts of the RHVP. In assessing the quality of the aggregate for potential inclusion on the DSM list, the MTO carried out its standard laboratory and in-field evaluations. The aggregate's long-term frictional trends were assessed by carrying out annual skid testing on a 3.8 km section of the RHVP between 2008 and 2014, with the exception of 2013 (the "DSM results").

6. The friction data set out in the DSM results was limited in nature, having been collected and reviewed internally to evaluate the underlying aggregate rather than to assist with any sort of road safety investigation or further to any identified concerns. With the exception of an initial concern in 2010 when a greater than expected annual friction decline was identified, MTO had no concerns with the results. The MTO alerted the City to the decline in November 2010. It was ultimately determined to be due to a test speed error and was a non-issue.

7. The DSM results were not otherwise shared with the City until February 2019 when the issues at the heart of this Inquiry became known to MTO. However, it is without question that the MTO acted reasonably and that its conduct had no impact on City interests or the safety of the motorists travelling on the RHVP. The following is of note:

[4] The "MTO Report" in the Terms of Reference refers to a chart of MTO 2007 friction results and not a formal engineering report with an analysis.

a) The MTO did not know that the City or its consultant Golder Associates Ltd. ("Golder"), had any concerns about the use of the aggregate in the RHVP surface course. The MTO was aware of a general concern with Stone Mastic Asphalt ("SMA") mixes, which prompted Golder's request for the 2007 friction test on behalf of the City. The results were satisfactory, and they were provided to Golder with an offer by MTO to assist if there were any related questions. No one from the City or Golder contacted the MTO with questions or to express potential concerns with RHVP friction, and the MTO reasonably assumed there were none;

b) Although Golder asked that the MTO courtesy test the RHVP for the City again in 2013 (along with various other City facilities), MTO was not able to accommodate the request. MTO referred Golder to a company that could carry out the testing and, having not heard anything further, assumed that the matter had been resolved. Since the MTO representative who handled the 2013 request was not aware of the prior DSM results, they were not shared with Golder at that time;

c) The decline in friction shown in the MTO data levelled off after the 2012 testing (as confirmed by friction experts testifying at the Inquiry) and were all acceptable to MTO. MTO accepted the aggregate for inclusion on the DSM list and it remained on the list until it was removed by the quarry in 2016;

d) The MTO's treatment of the RHVP friction data was not at all affected by the fact that it was a municipal road. Had the RHVP been a Provincial road and tested for DSM list purposes, the MTO would have continued its monitoring to assess the aggregate's long-term frictional trends for DSM list suitability, as is standard procedure. This is not the same as continued monitoring after in-field roadway

problems have been identified and an MTO regional investigation has commenced; and,

e) It was reasonable for the MTO to assume the City, which itself manages an extensive road network, had implemented appropriate checks and balances in order to monitor friction and ensure road safety. The City had its own consultants that were engaged in the management of the RHVP, including consultants who had the 2007 results and consultants who, at the time of the RHVP's construction, recommended that the City carry out friction testing on the facility every 1 to 2 years.

8. It is clear that the City would not have changed how it monitored the RHVP or how it assessed safety on the RHVP had the MTO shared the remaining friction data with it prior to February 2019. This is supported by the following evidence:

a) MTO's final friction data was collected in 2014 and the results were only slightly lower than the 2007 results. The 2007 results were received by the City without questions or apparent concern;

b) The City also did not act when MTO informed it of the only potential issue with the data, which was in 2010;

c) The City did not take immediate meaningful action upon its receipt of the MTO data in February 2019; and,

d) The City received various RHVP consultant reports prior to 2019, which were far more extensive than MTO's data and identified various concerns unlike the MTO data (which, again, showed satisfactory friction levels on the RHVP). The MTO

data would not have added any insight, identified any concerns, or increased the City's urgency to act relative to the findings and impacts from those reports.

9. Ontario's submissions are set out below. They focus on four areas:

PART A – Provincial policies, practices and procedures, including those pertaining to: (i) MTO's friction testing practices, (ii) sources of friction testing requests, (iii) the Designated Sources of Materials List, (iv) MTO's approach to friction numbers, and (v) Ontario's experience with SMA;

PART B – The Province's involvement with the RHVP, specifically (i) The 2007 friction test, (ii) the Varennes Quarry DSM list application, (iii) MTO's monitoring of the long-term characteristics of the Varennes Quarry aggregate, (iv) Golder's 2013 request for friction testing, and (v) MTO interactions with the City in 2019;

PART C – The Province's position that: (i) the MTO friction results were acceptable, (ii) MTO lacked information about friction demands on the RHVP, (iii) MTO's distribution of all friction test results was reasonable, and (iv) the earlier dissemination of the DSM results would not have triggered action; and,

PART D – The Province's position on jurisdictional issues in respect of the Inquiry.

PART A – PROVINCIAL POLICIES, PRACTICES AND PROCEDURES

(i) MTO's Friction Testing Practices

10. MTO performs pavement skid resistance testing ("friction testing") on the Province's road network. It does so using a brakeforce trailer, which is the American Standard Testing Materials ("ASTM") E 274 locked wheel skid tester ("skid trailer" or "ASTM trailer").[5] The skid trailer takes in-field friction measurements at defined intervals and reports friction numbers ("FNs").[6] In applying a "locked-wheel" approach to testing, the skid trailer sprays water on the roadway, applies a wheel brake, and then records friction levels at various intervals based on the actual force required to stop the tire.[7]

11. MTO employs one Pavement Evaluation Supervisor who operates the skid trailer and performs all of the Province's friction testing.[8] This position, and the responsibility for carrying out friction testing, falls within the purview of the central MTO pavements and foundations ("P&F") section within the Materials Engineering and Research Office ("MERO").[9]

12. MTO performs its testing at the posted speed.[10] This allows it to measure the actual friction levels experienced by drivers, and it takes into account the safety of the Pavement Evaluation Supervisor (who typically operates the skid trailer in traffic to avoid closing an

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[5] Affidavit of Bob Gorman (former MTO Geologist) affirmed May 25, 2022 ("**Gorman Affidavit**"), paras 4(b), 7 and 8.
[6] RHVPI Transcript dated May 16, 2022, Day 1 Evidence of Becca Lane (MTO Director of Central Operations) ("**Lane Transcript 1**"), pp 1985-7: The skid trailer also records temperature, trailer speed, and testing point locations.
[7] Lane Transcript 1, p 1987 (lines 7-12); RHVPI Transcript dated May 24, 2022, Evidence of Frank Marciello (former MTO Pavement Evaluation Supervisor) ("**Marciello Transcript**"), p 2658 (line 5) - p 2659 (line 3).
[8] Marciello Transcript, p 2649 (line 11) - p 2651 (line 2).
[9] Lane Transcript 1, p 1945 (lines 9-10). Note that the section name has since changed to the "Pavements Section", and MERO is now called the "Engineering Materials Office".
[10] Lane Transcript 1, p 1933 (lines 17-25): This is in contrast to the ASTM speed of 40 miles per hour.

otherwise open road).[11] Using the skid trailer to measure friction on turns and curves is generally avoided due to the risk of skidding with wheel locking, but this is not a significant impediment to MTO's testing activities given that the Province's road network consists primarily of highways (which are relatively straight by nature).[12]

13. MTO conducts its friction testing in spring, summer and early fall, as low/ freezing temperatures must be avoided given the skid trailer's use of sprayed water.[13] MTO's assessment of FN results typically involves a review of average FNs for each road segment, on a per-lane basis.[14] However, depending on the underlying purpose of the testing and whether there are significant deviations in the individual FNs, it may be appropriate to break the assessment down further.[15] For instance, if there is an issue with performance on a road and there are many consecutive low FNs on one specific section, this could indicate a need for remedial work regardless of an overall acceptable average when using all FNs collected.[16]

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[11] Lane Transcript 1, p 1933 (line 14) - p 1934 (line 18); Marciello Transcript, p 2659 (line 4) - p 2660 (line 8).
[12] Marciello Transcript, p 2677 (line 21) - p 2678 (line 9); RHVPI Transcript dated May 25, 2022, Evidence of Tom Klement (MERO Senior Research Engineer) ("**Klement Transcript**"), p 2982 (line 24) - p 2983 (line 16).
[13] Marciello Transcript, p 2689 (line 25) - p 2690 (line 1); Klement Transcript, p 2894 (line 24) - p 2895 (line 5); RHVPI Transcript dated May 17, 2022, Day 2 Evidence of Becca Lane (MTO Director of Central Operations) ("**Lane Transcript 2**"), p 2220 (lines 11 to 12); RHVPI Transcript dated May 19, 2022, Evidence of Chris Rogers (MTO Head of Soils and Aggregates) ("**Rogers Transcript**"), p 2568 (lines 7-12).
[14] Lane Transcript 1, p 1982 (lines 11-14); RHVPI Transcript dated May 26, 2022, Evidence of Stephen Lee (MTO Head of Pavements) ("**Lee Transcript**"), p 3018 (lines 9-19); RHVPI Transcript dated May 17, 2022, Day 1 Evidence of Chris Raymond (MTO Head of Construction Contracts) ("**Raymond Transcript 1**"), p 2283, (lines 3-20).
[15] RHVPI Transcript dated May 18, 2022, Evidence of Tom Kazmierowski (MTO MERO Manager) ("**Kazmierowski Transcript**"), p 2408 (lines 14-20).
[16] Lane Transcript 1, p 1978 (lines 3-15) and p 1983 (line 7) - 1984 (line 11); Lane Transcript 2, p 2160 (lines 11-25); Lee Transcript, p 3021 (lines 11-14): Individual FN outliers that are inconsistent with others obtained during a test can often be attributed to factors such as traffic flow, driver behaviour, and/ or mix characteristics. FN values can also vary between tests based on additional factors such as differences in testing equipment and precise testing locations. RHVPI Transcript dated February 16, 2023, Day 2 Evidence of Dr. Gerardo Flintsch (Dan Pletta Professor at Civil and Environmental Engineering, Virginia Tech) ("**Flintsch Transcript 2**"), p 15602 (lines 15-25) and p 15603 (lines 1-18).

(ii) Sources of Friction Testing Requests

(a) Internal Regional Requests for Friction Testing

14. The Province has adopted an eyes-on-the-road approach to road maintenance. This includes annual network evaluations by geotechnical staff within the MTO's five regional offices, as well as regular in-field assessments by regional maintenance staff with monitoring of issues such as excessive collisions as part of their day-to-day duties.[17] If MTO regional staff identify issues during their evaluations (e.g. if they discover visual abnormalities like pavement flushing), they would report those concerns to the Head of the region's geotechnical section for continuing investigation.[18] In instances where the Head suspects that friction could potentially be contributing to the issues, the region would reach out to the central P&F section to request investigative assistance by way of friction testing.[19]

15. The P&F section's Pavement Evaluation Supervisor would conduct the friction testing as requested by the region, clarifying information as necessary with regional staff (e.g. location specifics). Once completed, the results would be provided to the region by way of the raw data generated by the skid trailer. Regional personnel would then assess the results with the region's engineers,[20] and with knowledge of the roadway characteristics and underlying concerns, would decide whether and how to continue with their investigatory efforts, including whether to budget for (or immediately pursue) remedial measures.[21]

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[17] Lane Transcript 1, p 1940 and p 2015; Rogers Transcript, p 2513 (lines 8-14).
[18] Lane Transcript 1, pp 1942-3.
[19] Lane Transcript 1, p 1941; MTO0033718 ("Pavement Friction at MTO" slide deck dated November 4, 2004), p 5.
[20] Lane Transcript 1, p 1941 (lines 2-9) and p 1984 (line 20) - p 1985 (line 9).
[21] Lane Transcript 1, p 1939 (line 20) - p 1941 (line 9); p 1958 (lines 9-17) and pp 1971-2.; Klement Transcript, p 2908 (line 16) - p 2909 (line 19), and p 2919 (line 21) - p 2920 (line 9); Lee Transcript, p 3016 (line 24) - p 3017 (line 21) and p 3099 (line 18) - p 3100 (line 2).

16. From time-to-time, the friction tests may be shared with contractors or others by regional staff. This may be done, for instance, to support a demand for remedial work or upon request of the contractor if interested in the frictional performance of their previous contracts.[22]

(b) Friction Testing for DSM List Purposes

17. As detailed further below (Part A (iii) "The DSM List"), the Province maintains a DSM list that sets out a number of categories of materials that have been pre-approved for use on MTO projects.[23] Section 3.05.25 of the DSM list contains premium asphalt aggregates that have been approved for use as surface courses on MTO roads.[24]

18. A significant portion of MTO's friction testing work is conducted at the request of the Soils & Aggregates ("S&A") section of MERO**,** which is the custodian of the DSM list.

19. Friction testing for DSM list purposes is carried out by the P&F section Pavement Evaluation Supervisor pursuant to an annual request memorandum submitted by the Geologist responsible for maintaining the DSM list (based out of the S&A section). The purpose of the DSM list friction testing is to assess whether an aggregate has suitable frictional qualities, particularly in the long-term.[25] DSM assessments generate information about the characteristics of aggregates, including their frictional trends, which may influence whether the aggregate remains on the DSM list over time.[26]

[22] Lane Transcript 1, p 1951 (line 9) – p 1952 (line 22); Note that, to the extent that MTO has performance-based contracts in place, it may conduct friction testing to ensure compliance with contractual requirements. In such instances, friction results will also be shared with the contractor.
[23] Lane Transcript 1, pp 1917-8.
[24] Gorman Affidavit, paras 1 and 4; Lane Transcript 1, p 1922; MTO0004472 (DSM Manual), p 20.
[25] Lane Transcript 1, p 1917 (line 21) - p 1919 (line 3).
[26] Gorman Affidavit, para 8.

20. After an aggregate is tested for inclusion (or continued inclusion) on the DSM list, the Pavement Evaluation Supervisor will typically send the results back to the S&A section Head and the Geologist responsible for DSM management. A copy is also sent to the Head of the P&F section as the Pavement Evaluation Supervisor's direct manager for work tracking purposes.[27]

21. DSM list applicants are not usually provided with copies of the friction tests themselves. However, where an application is satisfactory, the applicant would be informed via letter from the S&A section that the aggregate has been accepted for inclusion on the DSM list.[28] In the correspondence, it would be confirmed that the aggregate has achieved satisfactory in-field friction testing results for two consecutive years, and that future friction testing will take place to ensure that the aggregate remains suitable for continued inclusion on the DSM list.[29]

(c) External Requests for Friction Testing

22. A third category of friction testing that occurs much less frequently is that carried out pursuant to requests from external entities such as municipalities.[30] These requests are often made informally by an external requestor with a contact at MTO and are forwarded to the P&F section. The P&F section Head, often in conjunction with the Pavement Evaluation Supervisor, then assesses whether MTO can accommodate the

[27] Lane Transcript 1, p 2106 (line 22) – p 2107 (line 1); Rogers Transcript, p 2482 (line 19) – p 2483 (line 6); RHVPI Transcript dated May 24, 2022, Evidence of Stephen Senior (MTO Head of Soils and Aggregates) ("**Senior Transcript**"), p 2791 (line 19) – p 2792 (line 13).
[28] Lane Transcript 1, p 1950 (line 25) - p 1951 (line 8); MTO0000046 (Letter from Stephen Senior re: Approval of Varennes Quarry aggregate; May 20, 2009); MTO0000047 (Table 1 Laboratory Test Results); Senior Transcript, p 2811 (line 20) - p 2812 (line 3).
[29] Lane Transcript 1, p 1951 (lines 1-8); Senior Transcript, p 2799 (line 8) - p 2800 (line 12) and p 2836 (line 20) - p 2837 (line 4); Gorman Affidavit, paras 6(f), 7 and 20.
[30] Lane Transcript 1, p 1947 (line 1) and p 1949 (lines 1-9).

testing.[31] This will typically depend on the capacity of the Pavement Evaluation Supervisor, along with the scope of the request and the location of the roadway(s) in question.[32]

23. The Province's own friction testing needs are prioritized over external testing, which is carried out as a courtesy where resources permit.[33] Where MTO is unable to carry out friction testing for an external entity, information is typically provided to the requestor about available alternatives such as private friction testing companies.[34]

24. If MTO conducts the testing, the requestor is provided with the raw data friction test results setting out the FNs generated by the skid trailer.[35] Requestors may be provided with high-level explanations of the data if requested, and in the infrequent circumstance where a potential safety concern is evident from the raw data itself,[36] this would be flagged for the requestor as well.[37] MTO personnel would not prepare any additional analysis by way of reports or assessments for the external entities, although they would be at liberty to engage consultants to do so where desired (MTO would not place restrictions on how the external entity uses the data).[38]

(d) Network Level Testing

25. MTO may also perform internal network level friction testing, which is testing across the entirety of a road network or on a representative sampling of the network's roads.

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[31] Lee Transcript, p 3067 (line 20) - p 3068 (line 17).
[32] Marciello Transcript, p 2692 (lines 1-9).
[33] Lee Transcript, p 3074 (lines 8-13); Lane Transcript 1, p 1947 (line 2) - p 1948 (line 6); Marciello Transcript, p 2694 (lines 2-6).
[34] Lane Transcript 1, p 1947.
[35] Lane Transcript 1, p 1949 (lines 23-25), and p 1950 (lines 1-12).
[36] It is only in extreme instances that friction results alone would identify a road safety issue or the need for remedial work; see paras. 44-47, below, for further detail about FN interpretation.
[37] Lane Transcript 1, p 1950 (lines 13-18).
[38] Lane Transcript 1, p 1950 (lines 1-12).

26. In 2013, MTO used its skid trailer to measure friction on over 150 roads across the Province's road network (or over 1000 distinct road sections) to enable a better understanding of the state of the road network at that time.[39] The friction results were analyzed alongside other measures[40] to inform MTO's decision about whether to replace the DSM list with performance-based specifications and, if so, with what performance targets.[41] As a potential target, consideration was given to whether to set friction thresholds based on roadway classifications and traffic volumes.[42]

27. The 2013 test sites were randomized and consisted of both asphalt and concrete pavements of varying ages, with different mix designs and surface types (one of which was SMA).[43] The testing and analysis was considered preliminary (or "rudimentary"), in that it was expected that additional testing would be necessary to fill gaps in the event that performance-based specifications were developed to replace the DSM list.[44] Follow-up testing was ultimately not required.[45]

[39] MTO0014810 (Email from Chris Raymond fw: Notes from ORBA Friction Meeting, March 10, 2014); MTO0014810, slide 3; Lee transcript, pp 3026-7 and p 3028 (lines 5-18); Lane Transcript 1, p 2023 (lines 14-21).
[40] MTO0014810 (Email from Chris Raymond fw: Notes from ORBA Friction Meeting, March 10, 2014); Lee Transcript, p 3038 (lines 3-9): MTO used ARAN equipment to collect macrotexture data, which supplemented the skid trailer data for the purpose of generating numbers based on the International Friction Index.
[41] Lee Transcript, p 3023 (line 25), p 3024 (lines 1-14) and p 3074 (lines 13-22).
[42] Lee Transcript, pp 3033-4.
[43] MTO0014810 (Email from Chris Raymond fw: Notes from ORBA Friction Meeting, March 10, 2014), slides 4 and 13; Lee Transcript, p 3026 (lines 17-25), p 3027 (lines 1-11), p 3046 (lines 17-24), p 3041 (lines 2-23), and p 3043 (lines 6-21).
[44] MTO0014810 (Email from Chris Raymond fw: Notes from ORBA Friction Meeting, March 10, 2014), slide 13; Lee Transcript p 3040 (lines 5-23) and p 3045 (lines 4-22).
[45] Lee Transcript, p 3040 (lines 16-23) and p 3074 (lines 13-24).

(iii) The Designated Sources of Materials ("DSM") List

28. In maintaining the DSM list, MTO applies an upfront screening process to pre-approve asphalt aggregates for use as surface courses on its roads.[46] The purpose in applying an upfront screening process is to provide contractors with a list of aggregates that have been evaluated and deemed to be high quality for use on Provincial road contracts, thereby enhancing efficiency, effectiveness and value-for-money.[47] However, MTO for many years considered the utility of replacing its upfront screening processes with backend quality control measures, primarily in the form of contractual performance targets and failure criteria.

29. As of May 1, 2015, MTO had decided that the DSM list would remain in place and would not be substituted with performance-based contracts.[48]

30. Maintaining the DSM list was preferred to the backend approach for various reasons, including a need to ensure aggregate performance throughout the life of the pavement and particularly beyond a stipulated warranty period. To do so with a backend approach would require measuring adherence to a variety of numerical targets (including more than friction, e.g. rutting), on an ongoing and network-wide basis. For a road network of Ontario's size, doing so would be impossibly resource-intensive,[49] particularly relative

[46] MTO0004472 (DSM Manual), p 20; Gorman Affidavit, paras 1 and 4; Lane Transcript 1, p 1922.
[47] Lane Transcript 1, p 1923 (line 12) – p 1924 (line 6), p 1939 (line 20) – p 1940 (line 2).
[48] Lee Transcript, p 3060 (line 5) - p 3061 (line 14); Lane Transcript 1, p 2029 (lines 7-25), and pp 2030-1: Although the MTO still uses some project-specific performance-based contracts, they have not replaced the DSM list. Further, friction targets are no longer set out in the contracts, and other measures are included to determine quality; Lee Transcript, p 3058 (line 15) – p 3061 (line 14); Lee Transcript, p 3060 (line 3) - p 3061 (line 14); MTO0014811 (MTO Network Friction Analysis, presented at ORBA Hot Mix Committee, March 4, 2014).
[49] Lane Transcript 1, pp 2005-6, and p 2007 (lines 9-18).

to resources required for upfront screening,[50] and would present administrative/ contract management difficulties.[51]

31. Further, recourse for failing to meet targets during the warranty period would typically be the removal and replacement of the pavement.[52] Even where costs are absorbed by contractors, the process impedes road use and requires MTO monitoring, and could potentially be required as early as immediately after construction given the lack of upfront aggregate standards and screening (particularly where contractors do not have experience with friction management).[53] Where low cost materials are available that would likely meet quality requirements for the short-term warranty period, contractors would have no incentive to use higher quality alternatives more likely to last throughout the entire pavement life cycle.[54]

32. On the other hand, the pre-qualification process reduces the need for contractors to employ specific friction management programs to mitigate subpar friction risks and costs associated with surface course removal and replacement (which, in turn, would be reflected in fewer project bids and/ or higher bid prices).[55] It provides assurance in terms of road quality and reduces the risk of early life reconstruction. MTO is better able to ensure that the contract is built properly, that it has knowledge of the materials used and that their long-term qualities have been assessed.

[50] Lane Transcript 1, p 2022 (lines 8-19).
[51] Lane Transcript 1, p 2015 (lines 3-14).
[52] Lane Transcript 1, p 2012 (lines 13-16).
[53] Lane Transcript 1, p 2021 (lines 5-10).
[54] Lane Transcript 1, p 2013 (lines 2-18).
[55] Lane Transcript 1, p 2019 (line 10) - p 2021 (line 4).

33. In short, upfront sampling, testing and construction oversight provides a level of confidence in terms of highway performance. This is particularly so when combined with ongoing regional maintenance activities.[56]

(a) MTO's Surface Course Directive

34. The MTO's Surface Course Directive stipulates what materials must be used for the surface layer of Provincial roads, which is based on annual average daily traffic.[57] With higher traffic volumes come increased requirements about the nature of the surface course (e.g. Superpave, FC1, FC2 or SMA) and the sourcing of one or both of the coarse and fine aggregates from the DSM list.[58]

(b) Qualifying for the DSM List

35. An application for an aggregate's inclusion on the DSM list requires the submission of a letter of consideration to the Head of the S&A section.[59] Thereafter, S&A staff will conduct a site visit to visually inspect quarry operations and to obtain aggregate samples for laboratory and in-service testing.[60] The qualification process consists of:

(a) Geological examination by S&A staff to ensure satisfactory nature and consistency of the source, including the consistency of the aggregate within the quarry;[61]

(b) Inspection of the production facilities by S&A staff to ensure suitability;[62]

(c) Sampling of 1,000-tonne stockpiles of coarse and fine aggregate;[63]

(d) Polished stone value ("PSV") testing, with an average PSV of 50 or more and no value less than 48;[64]

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[56] Lane Transcript 1, p 2006 (lines 16-21); MTO0000053 (Surface Course Directive).
[57] Lane Transcript 1, p 2034 (lines 19-23).
[58] Lane Transcript 1, pp 2031-2; MTO0000053 (Surface Course Directive).
[59] Rogers Transcript, p 2481 (lines 5-20); MTO0004472 (DSM manual), pp 9-10, 20.
[60] MTO0004472 (DSM manual); Gorman Affidavit, para 4(b).
[61] Lane Transcript 1, pp 1927-8; MTO0004472 (DSM manual), pp 10-11, 20.
[62] Rogers Transcript, p 2617 (lines 17-19); MTO0004472 (DSM manual), pp 11, 20.
[63] Rogers Transcript, p 2504 (line 20) - p 2505 (line 1); MTO0004472 (DSM manual), p 20.
[64] Lane Transcript 1, p 1929; MTO0004472 (DSM manual), p 20: The DSM manual provides for an exception in the case of quartzite aggregates.

(e) Aggregate abrasion value ("AAV") testing, with results of 6.0 or less;[65]

(f) A minimum of two years of satisfactory post-winter friction levels, as measured by MTO's ASTM trailer;[66]

(g) Registration with The Road Authority;[67] and,

(h) Payment of a registration fee for inclusion on the DSM.[68]

36. In order to facilitate the friction tests, a producer would typically arrange for the placement of its aggregate on a 500-metre section of an existing MTO contract ("test strip").[69] This allows for the placement of the aggregate next to an already DSM-approved aggregate source, which can act as a control if necessary.[70] The test strip is then tested for its frictional characteristics with the ASTM trailer for at least two years before it will be considered for inclusion on the DSM list.[71]

37. A test strip is not mandatory pursuant to MTO policy, but it can be beneficial where sub-par friction results are obtained during the assessment period.[72] In such a case, friction levels on the control section may shed light on whether the low results can be attributed to the aggregate or other factors (e.g. temperature).[73] The control section can

[65] MTO0004472 (DSM manual), p 20; Lane Transcript 1, p 1929.
[66] MTO0004472 (DSM manual), p 21.
[67] Lane Transcript 2, p 2180 (line 9) - p 2181 (line 1); MTO0004472 (DSM manual), pp 9-10.
[68] Lane Transcript 2, p 2181 (lines 2-7); MTO0004472 (DSM manual), pp 9-10, 21.
[69] Lane Transcript 1, pp 1931-2; MTO0018621 (Rogers et. al, *Pavement Surface Friction on Ontario Highways*, (April 20th, 2004)).
[70] Lane Transcript 1, p 1932 (lines 1-4).
[71] Lane Transcript 1, pp 1932-3.
[72] MTO0018621 (Rogers et. al, *Pavement Surface Friction on Ontario Highways*, (April 20th, 2004)); Rogers Transcript, p 2631 (line 6) - p 2634 (line 2) and p 2639 (lines 3-12); RHVPI Transcript dated May 25, 2022, Evidence of Bob Gorman (former MTO Geologist) ("**Gorman Transcript**"), p 2860 (lines 2-12), p 2862 (lines 5-15), and p 2864 (lines 6-25); Senior Transcript, p 2779 (line 4) - p 2781 (line 24).
[73] Gorman Transcript, p 2881 (lines 4-11), p 2861 (lines 12-19) and p 2864 (lines 6-25); Senior Transcript, p 2782 (lines 7-10).

also provide more data points, which can be useful where testing is limited to a 500 metre test strip.[74]

38. Nevertheless, the Head of the S&A section has discretion to agree to forego a control section, and MTO has previously evaluated aggregates for DSM list purposes without control sections and without issue.[75] In such cases, if concerns develop, the S&A Head may opt to require the laying of a test strip against a control section for further aggregate testing.[76]

(c) Maintaining Status after Qualifying for the DSM List

39. As a result of following DSM list qualification procedures, the expectation is that approved aggregates will perform well over the long term.[77] However, all DSM approvals are conditional on continued satisfactory aggregate performance,[78] and continued evaluations of aggregates are carried over the duration of their inclusion on the DSM list.[79] This includes ongoing friction testing on test strips and/or when placed in-field on MTO contracts.[80] It could also include additional site visits to quarries that produce aggregates regularly used for MTO contracts, and ad hoc testing of aggregate samples.[81]

40. Where the FN results of DSM list aggregates appear to be low, which is rare given the nature of MTO's upfront screening,[82] various courses of action may be explored based

[74] Gorman Transcript, p 2861 (lines 18-24).
[75] Gorman Transcript, p 2862 (line 23) - p 2863 (line 5), p 2859 (line 21) - p 2860 (line 2), and p 2861 (lines 7-13); Gorman Affidavit, para 19.
[76] Senior Transcript, p 2814 (line 25)-p 2815 (line 12); Gorman Transcript, p 2862 (line 23)- p 2863 (line 5), p 2859 (line 21) - p 2860 (line 2) and p 2861 (lines 7-13); Gorman Affidavit, para 19.
[77] Lane Transcript 1, p 1939 (line 15) – p 1940 (line 2).
[78] Gorman Affidavit, para 22; Senior Transcript, p 2811 (lines 1-19).
[79] Lane Transcript 1, p 1940 (lines 3-21).
[80] MTO0033718 (slide deck) attached to MTO0033716 (Email from Marciello, August 29, 2008).
[81] Lane Transcript 1, p 1935 (lines 1-12); Rogers Transcript, p 2500 (line 20) - p 2501 (line 6): Note that the frequency of MTO visits to quarries and associated lab testing activities for ongoing DSM list purposes have decreased over time as staffing constraints have increased.
[82] Lane Transcript 1, pp 1939-40; Senior Transcript, p 2787 (lines 17-23) and p 2788 (line 7) - p 2789 (line 10).

on what is warranted in the circumstances.[83] It may be appropriate to implement a longer qualification period before including the aggregate on the DSM list (i.e. friction tests for a period of 4 or 5 years instead of 2 years),[84] or to place conditions on the use of the aggregate.[85] MTO would work with a proponent to determine and eliminate the source of the problem rather than automatically de-list the aggregate.

(iv) MTO's Approach to Friction Numbers

(a) MTO Does Not Apply a Threshold-Based System

41. MTO has not adopted a system of friction thresholds that would apply broadly across its road network, whereby pavement investigations and remedial work are triggered by defined FNs. After the 2013 network level testing and analysis of the results, a decision was made not to set across-the-board contractual FN targets. This was informed in part by the fact that friction demand varies across and within roadways, and there is simply no one-size-fits-all threshold system that would be appropriate for Province-wide implementation.[86]

42. In addition, with the implementation of a threshold-based system comes the risk of over-reliance on specific numerical values at the expense of a comprehensive approach to friction management, despite the fact that FNs are often of limited use in and of themselves.[87] There is simply no set FN where a pavement goes from "being good to bad".[88]

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[83] Rogers Transcript, p 2510 (line 16) – p 2511 (line 14); Senior Transcript, p 2788 (line 7) – p 2789 (line 10).
[84] Rogers Transcript, p 2499 (lines 3-22).
[85] Senior Transcript, p 2788 (line 12) - p 2789 (line 10) and p 2790 (lines 10-22): Conditions may include requiring quarry owners to not supply the materials to other pavers and alerting MTO to the use of the aggregate in any MTO contracts.
[86] Lane Transcript 1, p 1956 (lines 5-11), and p 2027 (lines 3-21); Flintsch Transcript 2, p 15665 (lines 4-12); Expert Report of Dr. David K Hein dated February 1, 2023 ("**Hein Report**"), p 12, para 39.
[87] Lane Transcript 1, p 1981 (lines 3-16).
[88] Lane Transcript 1, p 1981 (lines 17-22) and p 1978 (lines 3-20).

43. How FN results are interpreted within the MTO, and whether they prompt investigatory or remedial action, will depend on the context in which the testing was conducted. A "really important" distinction will always be whether the testing is performed in the context of a road that has been identified as problematic (i.e. to determine whether friction could be contributing to the issue), or merely as an information-gathering exercise (i.e. not as a result of in-field concerns).[89]

(b) MTO's Use of FN30 – In the Context of Regional Investigations

44. Where a request for friction testing is made by regional staff, it is because underlying concerns have developed that have prompted a regional investigation. Complaints from the public may have been the catalyst for a collision rate analysis carried out by regional staff, for example, or visual inspections by regional staff may have led to observed concerns about the road's state. Regardless of the nature of the concern, the very purpose of the testing is to assist the region with its investigation and how friction may or may not be contributing to the underlying issue.[90]

45. As a rough guideline in such cases, an average of FN value of 30 (FN30) or above has been used as an indicator that the friction levels are satisfactory and that the region may wish to focus on identifying a different cause for the issue.[91] Where an average FN is very low, such as below FN20, the results have been interpreted as an indication of friction deficiency requiring remedial action.[92]

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[89] Lane Transcript 1, p 1957 (line 2) - p 1958 (line 17).
[90] Lane Transcript 1, p 1959 (lines 7-15) and p 1965 (lines 7-18).
[91] Lane Transcript 1, p 1960 (lines 14-15).
[92] Lane Transcript 1, p 1957 (lines 8-12), p 1970 (lines 5-15), p 1971 (lines 2-9) and p 2008 (lines 11-19): Representatives of Golder also confirmed that friction numbers would only be a concern on their own if they were quite low, meaning under FN20; RHVPI Transcript dated June 23, 2022, Day 7 Evidence of Ludomir Uzarowski (Principal of Pavement and Materials Engineering, Golder) ("**Uzarowski Transcript 7**"), p 6416 (line 15) - p 6417 (line 2).

46. More often than not, and particularly where mid-twenties range FN numbers are obtained in respect of roads that have been deemed problematic, appropriately identifying the underlying cause of the issue requires an assessment of FN values in the context of other factors that, from an engineering perspective, are relevant to the roadway's particular friction demand.[93] These may include whether the roadway has multiple stops and starts, whether it is relatively straight, the posted speed (and driver practices in terms of speeds), traffic volumes, factors influencing driver expectations, the geometric characteristics of the roads (such as curves and grading), the presence of incoming or off-going traffic, the width of any shoulders, and the existence of roadside hazards (such as a road that is surrounded by a giant rock cut vs. a farmer's field), and more.[94]

47. While FN30 is deemed satisfactory, MTO's use of FN<30 may be considered an "investigatory threshold", albeit in the context of ongoing regional investigations. In other words, where friction results are less than FN30, friction would generally not be ruled out as a possible factor contributing to the identified roadway issue, and often the regional investigation would continue.

(c) MTO's Use of FN30 – No Underlying Road Concerns

48. Where friction testing is conducted outside of the "roadway concern" context, there are no suspected contributory friction issues motivating the work. Testing for the DSM list, for instance, is conducted to gain high-level information about an aggregate's frictional qualities and to assess long-term performance of the aggregate in question, and network level testing is carried out to gain a broader understanding of road network conditions. In

[93] Lane Transcript 1, p 1970 (lines 1-5).
[94] Lane Transcript 1, p 1957 (lines 21-25), p 1958 (lines 1-8), p 1960 (lines 16-25), p 1961 (lines 7-16), and p 1978 (lines 4-15).

these circumstances, results of less than FN30 do not automatically prompt roadway investigations or remedial action.[95]

49. With the 2013 network level testing, for instance, friction tests were conducted to get a sense of the existing friction levels across the network, which would need to be maintained in the potential absence of the DSM list. It was not conducted for the purpose of identifying and/ or remedying road sections with average FNs under 30.[96] Indeed, there was no subsequent consultation between the P&F section and regional personnel to discuss follow-up investigatory and/ or remedial action, or the results themselves.[97]

50. This is also clear in the context of DSM list friction testing, for which the S&A section has not adopted a specific FN threshold that would result in the de-listing of an aggregate; there is also no specific "satisfactory" control levels for comparison purposes.[98] Similarly, results below FN30 would not trigger an in-field road safety investigation in the circumstances (particularly given that DSM list testing often measures friction on a short 500 metre aggregate trial strip, i.e. there is no road to investigate).[99]

51. MTO uses FN30 as a very general guideline and does not apply it in a rigid manner.[100] If a roadway is performing without issue, the existence of FNs below 30 does not change that; ultimately, "what is going on, on the highway, is the most important

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[95] Lane Transcript 1, p 1957 (line 2) - p 1961 (line 22); Lane Transcript 2, p 2167 (line 9) - p 2170 (line 14) and p 2212 (line 20) - p 2214 (line 7); Raymond Transcript 1, p 2285 (line 6) - p 2287 (line 10); Kazmierowski Transcript, p 2402 (line 5) - p 2403 (line 17), and p 2466 (lines 2-22); Marciello Transcript, p 2686 (line 7) - p 2688 (line 7); Klement Transcript, p 2906 (line 17) - p 2909 (line 19), p 2915(line 11) - p 2917 (line 1) and p 2973 (line 10) - p 2984 (line 5); Lee Transcript, p 3009 (line 9) - p 3011 (line 20).
[96] MTO0014810 (Email from Chris Raymond fw: Notes from ORBA Friction Meeting, March 10, 2014) (see "ORBA Questions/Concerns").
[97] Lane Transcript 2, p 2170 (lines 10-14); Lee Transcript, p 3083 (line 17) – p 3084 (line 1) and p 3098 (line 12) – p 3101 (line 3).
[98] Senior Transcript, p 2788 (line 4) - p 2789 (line 10), p 2790 (lines 10-22), p 2800 (line 18) – p 2801 (line 4) and p 2830 (line 4) - p 2831 (no FN applied); Rogers Transcript, p 2561 (line 17) - p 2562 (line 3).
[99] Rogers Transcript, p 2496 (line 12) – p 2497 (line 8); Senior Transcript, p 2778 (line 7) – p 2779 (line 24); Gorman Transcript, p 2858 (line 7) – p 2861 (line 24); Gorman Affidavit, paras 6(f) and 7.
[100] Senior Transcript, p 2783 (line 17) - p 2784 (line 2).

feature, not this [*FN30*] number".[101] In deciding how best to use limited public resources, it simply is not prudent to automatically remedy pavements that have not been identified as problematic as soon as FN falls below 30.[102]

(d) MTO's Approach to Publishing Friction Thresholds and Distributing Results

52. MTO does not have a policy that sets parameters about when friction test results will be distributed outside of the P&F section. Internal practices have developed such that friction results may be shared with individuals outside of the P&F section. How and to whom they are shared depends on the purpose of the testing and the nature of the request (see above, Part A, section ii, "Sources of Friction Testing Requests").[103]

53. MTO refrains from at-large publishing of its own friction testing records, although contractors may request results from their own projects.[104] This mitigates the risk of uninformed over-reliance on specific FNs at the expense of comprehensive friction management practices (e.g. engineering reviews), and to avoid over-representing the inherent value of FNs (which is often minimal, absent additional information).[105]

54. For similar reasons, MTO does not publish information about what it considers "acceptable" in terms of friction levels.[106] If asked for such information (e.g. in the context

[101] Lane Transcript 1, p 1969 (lines 21-23).
[102] Lane Transcript 1, p 1969 (lines 9-25).
[103] Lane Transcript 1, p 1951.
[104] Lane Transcript 1, p 1950 (line 19) – p 1952 (line 22) and p 2008 (line 20) – p 2009 (line 21).
[105] Lane Transcript 1, p 1978 (lines 3-20) and p 1981 (lines 1-25).
[106] Lane Transcript 1, p 1967 (lines 11-18); MTO0018621 (Pavement Surface Friction on Ontario Highways, 2004, co-authored by Chris Rogers, Bob Gorman, Becca Lane and Frank Marciello): Although a 1982 research paper references "tentative guidelines" based on friction numbers, these proposed guidelines were not adopted by MTO.

of media requests), a standard MTO response would highlight the need to consider case-specific factors in order to determine the adequacy of road friction.[107]

55. That said, MTO has undertaken a wealth of research and trials of new technologies, including on friction-related topics. The results are often published papers containing robust analysis and practical takeaways, which are in turn presented at industry functions.[108] For instance, a paper entitled "Ten-Year Performance of a SMA Freeway Pavement in Ontario" describes MTO's first full-scale SMA trial, which took place between 1996 and 2006 and was presented at a 2007 conference held by the Canadian Technical Asphalt Association ("CTAA").[109] The paper details the in-field performance of an SMA pavement as against a Dense Friction Course ("DFC") pavement, and in doing so provides relative information about the performance of the pavements in terms of annual roughness and rutting, manual distress surveys and frictional properties.[110]

(iv) Ontario's Experience with Stone Mastic Asphalt ("SMA")

56. In 1996, MTO began using SMA on a trial basis on one of its highways.[111] The trial was prompted by European experience with SMA where it was observed that SMA outlasted and outperformed conventional mixtures, and was supported by the Canadian asphalt industry which was interested in its supposed durability and longevity.[112] The

[107] Lane Transcript 2, p 2186 (line 15) – p 2197 (line 9).
[108] Lane Transcript 1, p 2039 (line 12) - p 2040 (line 6). MTO0038374 (Skid-Resistance Aggregates in Ontario, Materials Engineering and Research Office Report-005, 2003, co-authored by Chris Rogers, Bob Gorman and Becca Lane).
[109] GOL0001571 (Ten-Year Performance of a SMA Freeway Pavement in Ontario, 2007, co-authored by Becca Lane), pp 12-21.
[110] Lane Transcript 1, p 2037 (line 17) - p 2038 (line 24) and p 2041 (line 22) - p 2042 (line 23); GOL0001571 (Ten-Year Performance of a SMA Freeway Pavement in Ontario), pp 17-21: The trial ultimately showed that both pavements performed well, although the SMA had not out-performed the DFC as had been expected.
[111] Lane Transcript 1, p 2039 (lines 10-25) and p 2040 (lines 1-6).
[112] GOL0001571 (Ten-Year Performance of a SMA Freeway Pavement in Ontario, November 2007), p 14; Raymond Transcript 1, p 2299 (line 6) - p 2300 (line 4); Lane Transcript 1, p 2058 (lines 8-10).

frequency of SMA use on Provincial roads increased thereafter and, as of 2003, the Surface Course Directive required that it be used for the Province's highest volume roads.[113]

57. By 2005, however, MTO had identified a potential early-age friction issue with SMA, in that lower-than-expected friction levels had been measured on some freshly paved SMA surfaces.[114] A joint SMA task group was established as a result to investigate the early-age friction concerns, which consisted of representatives from industry groups as well as the MTO ("SMA task group").[115]

58. It was initially proposed that the early-age friction issue could be resolved with an aggregate-specific solution, and in May 2007 a short list of acceptable aggregates for SMA mixes was developed.[116] However, the early-age friction issue persisted as "approved list" aggregates were found to produce early-age friction values in the low FN20s.[117]

59. On November 6, 2007, MTO implemented a pause on the use of SMA on Provincial roads.[118]

60. On November 13, 2007, the SMA task group reconvened to continue working on solutions to the early-age friction problem.[119] Between 2008 and 2014, the SMA task group attempted to improve early-age SMA frictional qualities by trialing various methodologies,

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[113] Lane Transcript 1, p 2032 (lines 6-16); MTO0000053 (Surface Course Directive, 2003), p 2.
[114] Lane Transcript 1, p 2051 (line 23) - p 2052 (line 8) and p 2052 (line 20) - p 2053 (line 5).
[115] Lane Transcript 1, p 2057 (line 23) - p 2058 (line 6); MT00012034 (MTO SMA Task Group Terms of Reference, March 8, 2007), p 1.
[116] MTO0018526 (Information Note, May 1 2007); MTO0001265 (Email from Raymond, August 1, 2007); Raymond Transcript 1, p 2325, (lines 5-7) and p 2308 (line 14) - p 2310 (line 13).
[117] MTO0003380 (Email from Tam, November 5, 2007).
[118] MT00001379 (MTO Information Note, November 6, 2007), pp 1, 3; Lane Transcript 1, p 2095 (line 12) - p 2096 (line 19) and p 2117 (line 18) - p 2118 (line 14). MTO0003380 (Email from Tam, November 5, 2007): The Province continued to allow the placement of some SMA, primarily in the context of already-awarded contracts (and to assist with early age friction SMA trials).
[119] MTO0001367 (Email from Raymond to Brown and Tam, November 2, 2007); MTO0001405 (SMA Task Group Minutes).

including water and shot blasting, gritting, and skid abrading.[120] A successful solution was ultimately achieved with the “hot grit” method, which involved applying fine aggregate (or grit) with an asphalt cement coating to the surface of the SMA when it was placed.[121]

61. MTO reinstated the use of SMA on October 31, 2014.[122] The Surface Course Directive was revised to reflect the reinstated use of SMA within the Provincial road network on December 12, 2014.[123]

[120] Lane Transcript 1, p 2061 (lines 7-25).
[121] Lane Transcript 1, p 2061 (lines 3-17).
[122] MTO0027603 (Email from Raymond to ORBA Executive Director, October 31, 2014); Lane Transcript 1, p 2061 (line 22) - p 2062 (line 5).
[123] MTO0000055 (December 2014 Ministry Directive).

PART B – THE PROVINCE'S INVOLVEMENT WITH THE RHVP

(i) The 2007 Friction Test

62. On July 31, 2007, Ludomir Uzarowski, Principal, Pavement and Materials Engineering, Golder and Associates ("Golder"), contacted Chris Raymond, MTO Senior Pavement Design Engineer. Dr. Uzarowski had heard that MTO was investigating early-age friction issues with SMA and had developed a revised list of SMA acceptable aggregates.[124]

63. Dr. Uzarowski informed Mr. Raymond that the City had selected an SMA mix for application on the RHVP mainline, which would be paved in early August 2007.[125] Dufferin Construction ("Dufferin") was involved in the RHVP project and had selected a Quebec aggregate from the Demix Varennes Quarry, which was not at the time an aggregate on the DSM list.[126] Dr. Uzarowski informed Mr. Raymond that the City may ask MTO to conduct friction testing on the RHVP prior to its opening.[127]

64. In September 2007, Dr. Uzarowski emailed Mr. Raymond and requested that MTO carry out the previously discussed RHVP friction testing.[128] Dr. Uzarowski advised that the testing was at the request of the City and provided the name of a colleague, Andros Delos

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[124] MT00001265 (Email from Raymond, August 1, 2007); Raymond Transcript 1, p 2323 (line 23) - p 2324 (line 15); RHVPI Transcript dated April 28, 2022, Day 1 Evidence of Ludomir Uzarowski (Principal of Pavement and Materials Engineering, Golder) ("**Uzarowski Transcript 1**"), p 472 (line 1) - p 473 (line 23).
[125] MT00001265 (Email from Raymond, August 1, 2007); Raymond Transcript 1, p 2324 (lines 7-9); Uzarowski Transcript 1, p 466 (line 13) – p467 (line 17), and p 429 (lines 8 -18): The paving started on August 1, 2007.
[126] Raymond Transcript 1, p 2324 (lines 9-12); MT00001265 (Email from Raymond, August 1, 2007); RHVPI Transcript dated May 2, 2022, Evidence of Peter Gamble (Dufferin Manager, Plants, Equipment and Technology) ("**Gamble Transcript**"), p 829 (line 24) - p 830 (line 8).
[127] MT00001265 (Email from Raymond, August 1, 2007); Raymond Transcript 1, p 2325 (line 21) - p 2327 (line 2).
[128] MTO0000005 (Email exchange between MTO and Golder, September, 2007), p3; MTO0000007 (Email exchange between MTO and Golder, September, 2007), p 4.

Reyes, who would coordinate the testing with the MTO (and assist with arranging for RHVP access, as it was not yet open to the public).[129]

65. On October 16, 2007, Frank Marciello, then the MTO Pavement Evaluation Supervisor, conducted friction testing of the RHVP using MTO's skid trailer.[130] Friction testing was "very limited" and was conducted on a section of the two southbound RHVP lanes between the CNR Structure and Greenhill Avenue (approximately 3.8 km in length).[131] Although there were ongoing construction activities on the RHVP, this section was clear enough such that a safe and effective data collection process could be carried out.[132]

66. On October 17, 2007, the MTO reviewed the RHVP friction results ("2007 results") and concluded that they were not only acceptable, but much higher than those collected on pavements presenting early-age SMA issues.[133] Although they were acceptable in their own right, since the RHVP pavement had not yet been open to traffic, there was also a possibility that friction levels would increase further once the RHVP was opened to the public.[134]

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[129] MTO0000007 (Email exchange between MTO and Golder, September, 2007), pp 1-2; Raymond Transcript 1, p 2334 (lines 17-23); GOL0003509 (Email from Uzarowski, September 2, 2007), p 1.
[130] MT00002227 (Email from Raymond, October 17, 2007), p 1.
[131] GOL0002642 (Email from Uzarowski, September 30, 2013), p 1; MTO0002227 (Email from Raymond, October 17, 2007); HAM0013371 (Email from Graham, February 13, 2019), p 2; MTO0002228 (2007 Friction Results, Southbound Lane 1); MTO0002229 (2007 Friction Results, Southbound Lane 2), p 1.
[132] MTO0002227 (Email from Marciello, October 17, 2007), p 1.
[133] RHVPI Transcript dated May 18, 2022, Day 2 Evidence of Chris Raymond ("**Raymond Transcript 2**"), p 2346 (line 19) - p 2347 (line 7) and p 2451 (line 14) - p 2453 (line 1); MTO0001325 (Email from Raymond, October 16, 2007); Lane Transcript 1, p 2090 (line 25) - page 2091 (line 14) and p 2051 (line 19) - p 2053 (line 5); MTO0002881 (Email from Lane, October 18, 2007); Kazmierowski Transcript, p 2452 (line 6) - page 2453 (line 1) and p 2455 (lines 4-8).
[134] Gorman Affidavit, para 10; Lane Transcript 1, p 2090 (line 1) – p 2091 (line 20); Lane Transcript 2, p 2169 (line 10) – p 2070 (line 5), and p 2227 (line 23) – p 2229 (line 19); Raymond Transcript 2, p 2342 (line 25) – p 2345 (line 17).

67. On October 18, 2007, Mr. Raymond provided the 2007 results to Dr. Uzarowski and Mr. Delos Reyes. Mr. Raymond requested that they distribute the 2007 results to those involved with the RHVP project. He also offered to assist if there were any questions about the 2007 results.[135]

68. Nobody from the City or Golder contacted Mr. Raymond with questions about the friction results or to express potential friction concerns in respect of the RHVP after the 2007 testing.[136] Although Dr. Uzarowski contacted Mr. Raymond again in November 2007, this was to provide him with information about a shotblasting company and was not in relation to the RHVP. At no time did Mr. Raymond suggest that the RHVP required shotblasting (or remedial work) based on the 2007 results.[137]

69. The 2007 results did not contribute to the MTO's decision to implement a pause on the use of SMA on November 6, 2007.[138]

(ii) The Varennes Quarry DSM List Application

70. On December 7, 2007, Paul Janicas of Dufferin emailed MTO's Chris Rogers (Head of the S&A section) to request that an aggregate produced by a Quebec quarry, the Demix Varennes Quarry ("Demix"), be placed on the MTO's DSM list. Mr. Janicas attached a letter from Demix dated November 22, 2007 requesting the same, which identified Demix as a division of St. Lawrence Clement.[139]

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[135] GOL0002619 (Email from Raymond, October 18, 2007) attaching GOL0002620 (Pavement Friction Survey 2007) and GOL0002621 (2007 results).
[136] Raymond Transcript 2, p 2350 (lines 12-19) and p 2394 (lines 5-12); Lane Transcript 2, p 2254 (lines 11-15); Kazmierowski Transcript, p 2432 (line 20) - p 2433 (line 2).
[137] Raymond Transcript 2, p 2371 (line 21) - p 2372 (line 1).
[138] Lane Transcript 1, p 2098 (lines 20-25) and p 2118 (line 24) - p 2119 (line 7); Raymond Transcript 1, p 2317 (lines 11-15) and p 2348 (lines 11-20); Kazmierowski Transcript, p 2452 (line 6) – p 2453 (line 1), and p 2455 (lines 4-8).
[139] MTO0000039 (Email from Rogers, December 10, 2007) attaching MTO0000040 (Letter from Estel Gagnon to Rogers, November 22, 2007).

71. In his correspondence, Mr. Janicas noted that the aggregate had just been placed on the RHVP.[140]

72. Mr. Rogers wrote back to Demix on December 13, 2007, acknowledging receipt of the application on behalf of MTO.[141]

73. Although the Demix aggregate was not on the DSM list and MTO had no record of a former application for its inclusion, it discovered that the Polished Stone Value ("PSV") of the aggregate had been tested by the MTO in 1992. It yielded a PSV of 45 at the time, which was below that required for inclusion on the DSM list. This did not impact MTO's consideration of the Demix application. Given that Demix is a large quarry and 15 years had passed since the PSV was collected, it was likely that the aggregate to be assessed for the purposes of the application was at least somewhat different than that tested in 1992.[142]

74. In considering the application, staff from MTO's S&A section visited Demix and took samples of the aggregate to test.[143] They looked at the crushing operation, inspected the rock face and looked for homogeneity in terms of rock type. They also obtained samples from the quarry's stockpile and hand samples for subsequent testing. Thereafter, PSV and aggregate abrasion value ("AAV") testing was carried out, and the results were considered against expected values for the classification of the aggregate (i.e. a traprock).[144]

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[140] MTO0000039 (Email from Rogers, December 10, 2007) attaching MTO0000040 (Letter from Estel Gagnon to Rogers, November 22, 2007); Gorman Transcript, p 2865 (lines 1-14).
[141] MTO0000042 (Letter from Rogers to Estel Gagnon, December 13, 2007) attaching MTO0000043 (2007 Demix Agregats Laboratory Test Data).
[142] Gorman Affidavit, para 11.
[143] Gorman Affidavit, para 11.
[144] Gorman Affidavit, paras 17-18; MTO0004472 (DSM Manual, June 4, 2003), p 20.

75. The MTO completed testing of the coarse aggregate and screening samples taken from the Varennes quarry. The laboratory test results were all favourable and met MTO's specification criteria.[145] The screenings and coarse aggregate samples were also submitted for Superpave Consensus Property Requirement testing and both the fine and coarse aggregate sample test results met American Association of State Highway and Transportation Officials specification criteria.[146]

76. The aggregate's AAV was 2.3 (thus meeting the requirement to fall at 6.0 or below), indicating a very good resistance to abrasion.[147] The aggregate's freeze/ thaw percentage of 1.6 was viewed as extremely good, which indicates that the aggregate is resistant to the weathering effects of freezing and thawing.[148] The test results were consistent with what MTO staff excepted for a traprock aggregate.[149]

77. The aggregate's 2008 PSV result was 52, which was above the required value for DSM inclusion and in line with excepted results for a traprock.[150]

78. With the return of acceptable laboratory results, MTO proceeded to conduct in-field friction testing of the aggregate. Given that the aggregate had just been laid on parts of the RHVP mainline, MTO agreed to take in-field friction measurements on the RHVP. Demix was informed that MTO would accept the RHVP as a test section for the DSM list application process in a letter of December 4, 2008.[151]

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[145] MTO0000044 (Letter from Senior, December 4, 2008) attaching MTO0000045 (2008 Demix Laboratory Test Results): Note that the criteria for inclusion is set out in Special Provision 110F12, Amendment to OPSS 1003, November 2004, Aggregates for Hot Mixed, Hot Laid Asphaltic Concrete.
[146] MTO0000044 (Letter from Senior, December 4, 2008) attaching MTO0000045 (2008 Demix Laboratory Test Results).
[147] Senior Transcript, p 2798 (lines 11-17).
[148] Senior Transcript, p 279 (lines 1-7).
[149] Gorman Affidavit, para 18.
[150] Gorman Affidavit, para 18; Senior Transcript, p 2798 (lines 7-10).
[151] Gorman Transcript, p 2868 (line 21)-p 2869 (line 24) and p 2871 (line 4) - p 2872 (line 2); MTO000044 (Senior Letter to Demix, December 2007); MTO000044 (Senior Letter to Demix, December 2008).

79. Testing of the Demix aggregate on a section of the RHVP resulted in a situation where its sufficiency for DSM list purposes would be determined, in part, by collecting measurements from a non-MTO facility.[152] Although this was highly unusual and a situation that staff in the S&A section had not previously dealt with, testing the RHVP made practical and economic sense. Demix would have otherwise had to find a suitable MTO contract in the following construction season on which to place a new 500 m test strip in order to have its application considered, which could have been an impediment given that the test strip aggregate would need to be transported from Quebec. The inclusion of additional qualified sources on the DSM list promotes value-for-money and robust economic development (particularly where the source might have unique advantages given that the quarry was in an area outside those of the other DSM list sources).

80. Because a new trial strip was not constructed on an MTO contract using an aggregate from the DSM list, there was no control section against which to assess the Demix aggregate. However, had concerns developed during the evaluation of the Demix aggregate, the Head of the S&A section could have required further testing on a freshly laid test strip incorporating a control section.[153] Ultimately, this was not necessary as the aggregate returned good values sufficient for inclusion/ ongoing inclusion on the DSM list.

81. On June 12, 2008, Mr. Marciello conducted the first friction test of the Demix aggregate for DSM list purposes on the RHVP at or around its posted speed of 90km/hr.[154]

[152] Senior Transcript, p 2778 (line 7) - p 2801 (line 22); MTO0000044 (Letter from Senior, December 4, 2008) attaching MTO0000045 (2008 Demix Laboratory Test Results); Gorman Affidavit, para 13.
[153] Senior Transcript, p 2814 (line 25)-p 2815 (line 12); Gorman Transcript, p 2862 (line 23) - p 2863 (line 5), p 2859 (line 21) - p 2860 (line 2) and p 2861 (lines 7-13); Gorman Affidavit, para 19.
[154] The 2008-2014 testing was conducted in mixed traffic at or around the posted 90 km/hr speed, except in 2010 when Mr. Marciello inadvertently conducted it at or around 100 km/hr.

82. Conducting the 2008 friction test did not require involvement from non-MTO personnel. Unlike the 2007 testing, which required coordination with external personnel to understand the nature and scope of the request and to arrange for access to the RHVP construction site, the 2008 testing was performed by Mr. Marciello at the internal request of the S&A section.[155] That request was submitted in the context of the annual request for friction testing, which set out all friction testing requests from the S&A section for DSM list purposes that year.[156] By that time, the RHVP had opened to the public, and the testing could be (and was) performed in mixed traffic at the posted speed without arranging for special access to the road.

83. The 2008 results were considered good, and acceptable for the aggregate's potential DSM list inclusion (i.e. if another year of acceptable results were obtained).[157]

84. The 2009 friction testing was carried out by Mr. Marciello on May 7, 2009, and the results were also considered acceptable.[158]

85. On May 20, 2009, the Head of the S&A section informed Demix that its aggregate had qualified for inclusion on the DSM list.[159] In that letter, it was noted that the 2008 and 2009 friction results from the RHVP were considered acceptable by the MTO for DSM list purposes. The FNs themselves were not sent out.[160]

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[155] Lane Transcript 1, p 2110 (line 16) - p 2111 (line 5).
[156] Lane Transcript 1, p 2105 (line 16) – p 2106 (line 3).
[157] Raymond Transcript 2, p 2383 (lines 8-19); MTO0024002 (2008 SB Lane 2 Results), MTO0024003 (2008 NB Lane 1 Results), MTO0024004 (2008 NB Lane 2 Results), MTO0024005 (2008 SB Lane 1 Results); Gorman Affidavit, para 16; Senior Transcript, p 2836 (line 12) - p 2837 (line 19).
[158] Gorman Affidavit, para 21; MTO0005228 (Email from Marciello, May 8, 2009) attaching 2009 Friction Tests (MTO0005229, MTO0005230, MTO0005231, MTO0005232).
[159] Senior Transcript, p 2837 (lines 5-25); Gorman Affidavit, para 22; MT00000046 (Letter from Senior, May 20, 2009).
[160] MT00000046 (Letter from Senior, May 20, 2009); Gorman Affidavit, para 22.

86. The Demix aggregate was included on the DSM list on May 20, 2009.[161]

(iii) MTO's Monitoring of Long-Term Characteristics of the Varennes Quarry Aggregate

87. As part of DSM list monitoring practices, in addition to the 2008 and 2009 friction testing, the Demix aggregate friction was tested in each of 2010,[162] 2011,[163] 2012[164] and 2014.[165] Each of the tests were carried out by Mr. Marciello as a function of his work in the P&F section, and pursuant to standard annual requests for testing made by the S&A section for DSM list purposes.[166]

88. In terms of the 2010 friction testing, the MTO formed a concern about the declining friction numbers disclosed by the results. Those results showed a drop in friction since the 2009 results were recorded, which was more significant than would be expected with a year of wear-and-tear. As MTO did not yet have many years of friction results for the Demix aggregate, it could not confirm whether the aggregate's friction was likely to continue to drop at the same rate moving forward.[167]

89. The 2010 results were sent to Ms. Lane by Mr. Marciello on November 15, 2010. In response, Ms. Lane confirmed that she intended to call Dr. Uzarowski to ask for a City

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[161] Gorman Affidavit, para 23; Senior Transcript, p 2837 (lines 20-25); MTO0000046 (Letter from Senior, May 20, 2009).
[162] MTO0012869 (Memorandum from S&A Section, March 31, 2010); MTO0034018 (Email from Marciello, April 1, 2010) attaching 2010 Friction Tests (MTO0034019, MTO0034020, MTO0034021, MTO0034022).
[163] MTO0012884 (Memorandum from S&A Section, March 17, 2011); MTO0034404 (Email from Marciello, May 26, 2011) attaching 2011 Friction Tests (MTO0034405, MTO0034406, MTO0034407, MTO0034408).
[164] MTO0012900 (Memorandum from S&A Section, March 29, 2012); MTO0007828 (Email from Marciello, April 12, 2012) attaching 2012 Friction Tests (MTO0007829, MTO0007830, MTO0007831, MTO0007832).
[165] MTO0012945 (Memorandum from S&A Section, April 2, 2014); MTO0022942 (Email from Marciello, July 25, 2014) attaching 2014 Friction Tests (MTO0022943, MTO0022944, MTO0022945, MTO0022046).
[166] Gorman Affidavit, para 24.
[167] Marciello Transcript, p 2722 (line 21) - p 2723 (line 14); Lane Transcript 2, p 2174 (lines 8-25); p 2251 (line 1) - p 2252 (line 22).

contact with whom she could share the information.[168] With the passage of time, Ms. Lane did not specifically remember doing so, however she provided credible evidence that she certainly would have reached out to Dr. Uzarowski for contact information given her stated intent, and in turn that she certainly would have contacted the City representative to inform him or her of the RHVP friction testing.[169]

90. Ms. Lane's evidence is corroborated by the evidence of Dr. Uzarowski, who made a note of contact from Ms. Lane on November 15, 2010, as follows: "Becca Lane, 2007 friction on RHVP".[170] In evidence, Dr. Uzarowski said that he was sure that Ms. Lane called him at that time, and confirmed that he would have provided her with contact information for Gary Moore.[171]

91. Mr. Moore was unable to recollect a conversation with Ms. Lane in or around that time. However, he acknowledged that it certainly could have occurred and that there would be no reason to doubt Ms. Lane's evidence on the matter.[172]

92. The concern in respect of the 2010 results was resolved in 2011. At that time, it was discovered that the decline in friction levels as between 2009 and 2010 was the result of human error. Mr. Marciello had carried out the 2010 test at 100 km/hr rather than at 90 km/hr, which was the posted speed of the RHVP and was the testing speed used in all other years. Mr. Marciello adjusted the 2010 results to reflect their approximate value had

[168] MTO0033270 (Email from Lane, November 15, 2010).
[169] Lane Transcript 2, p 2144 (line 21) - 2146 (lines 11-18).
[170] GOL0007502 (Notebook of Marciello, February 7 – December 8, 2010), p 2.
[171] RHVPI Transcript dated June 15, 2022, Day 3 Evidence of Ludomir Uzarowski (Principal of Pavement and Materials Engineering, Golder) ("**Uzarowski Transcript 3**"), p 5484 (lines 4-10) and p 5486 (lines 9-12).
[172] RHVPI Transcript dated May 10, 2022, Day 7 Evidence of Gary Moore (City of Hamilton Director of Engineering Services, Public Works) ("**Moore Transcript 7**"), p 9044 (lines 9-25) – p 9045 (lines 1-7).

the test been completed at 90 km/hr, and the adjusted results were used for the DSM list assessments thereafter.[173]

93. MTO viewed the 2011 and 2012 friction results as being acceptable for the continued inclusion of the Demix aggregate on the DSM list.[174]

94. In 2013, no friction test of the Demix aggregate or any other DSM list aggregates were carried out. This was because the MTO was using its skid trailer to conduct the network level testing, which was also presenting capacity issues for Mr. Marciello.[175]

95. A friction test was conducted in 2014. MTO viewed the results as being acceptable for continued inclusion of the Demix aggregate on the DSM list.[176]

96. The Demix aggregate was removed from the DSM list in 2016. This was the result of a business decision by Demix to de-list the aggregate to avoid incurring associated fees given that the aggregate had not been used on any MTO contract since its inclusion on the DSM list.[177]

(iv) Golder's 2013 Request for Friction Testing by the MTO

97. With the demands of the 2013 network level testing, MTO had to decline a request from Golder for MTO to conduct friction testing on various City facilities, including the RHVP.[178] The request was submitted on behalf of the City by Vimy Henderson of Golder

[173] Marciello Transcript, p 2727 (line 3) - p 2729 (line 3); Lane Transcript 1, p 2128 (line 5) - p 2129 (line 14).
[174] Senior Transcript, p 2838 (lines 13-20).
[175] Lee Transcript, p 3023 (line 25) - p 3024 (line 14) and p 3028, line 5 to line 1.
[176] Gorman Affidavit, para 25; Lane Transcript 2, p 2159 (line 15) - p 2161 (line 8); Senior Transcript, p 2838 (lines 13-20).
[177] Lane Transcript 1, p 2181 (line 23) - p 2183 (line 1); MTO0038646 (Email from Magnan, February 14, 2019), p 1; Senior Transcript, p 2839 (line 8) - p 2840 (line 1).
[178] Lee Transcript, p 3101 (lines 4-14) and p 3119 (lines 18) – p 31120 (line 3); GOL0004467 (Email exchange between Lee & Henderson), p 1.

on October 29, 2013.[179] The requested testing was for 18 kms each of lanes in both directions of the RHVP, as well as some RHVP ramps. Also requested was testing of the Lincoln Alexander Parkway ("LINC"), and crosswalks within the municipality. In the alternative, Dr. Henderson queried whether having fewer "random locations" tested on the RHVP and the LINC, as well as ramps and the crosswalks would be feasible.[180]

98. Mr. Lee of the MTO advised Dr. Henderson that the MTO would not be able to accommodate the request as it was behind in its network level testing.[181] Mr. Lee recommended that Ms. Henderson contact a third-party provider, Applied Research Associates ("ARA"), who could carry out the testing using the same equipment as the MTO used (i.e. ASTM trailer).[182]

99. In making the 2013 Golder request, Dr. Henderson did not inform Mr. Lee that Golder or the City had any specific in-field friction concerns pertaining to the RHVP, nor did Mr. Lee understand from the face of the request that any such concerns existed.[183]

100. Mr. Lee, who had assumed his position as Head of the S&A section in October 2012 (i.e. after the 2012 DSM test was conducted), did not then appreciate that there were RHVP friction results from prior years available from the testing of the Demix Aggregate.[184] As such, he did not alert Dr. Henderson to their existence.[185]

[179] GOL0004467 (Email exchange between Lee & Henderson).
[180] GOL0004467 (Email exchange between Lee & Henderson); Lee Transcript p 3119 (line 18) – p 3120 (lines 3).
[181] GOL0004467 (Email exchange between Lee & Henderson); Lee Transcript p 3120 (lines 4-17).
[182] GOL0004467 (Email exchange between Lee & Henderson); Lee Transcript p 3121 (lines 2-10).
[183] GOL0005567 (Aerial View of RHVP); Lee Transcript p 3120 (line 18) – p 3121 (line 1).
[184] Lee Transcript, p 3094 (line 23) – p 3096 (line 3).
[185] Lee Transcript, p 3069 (lines 2-9).

(v) MTO's Interactions with the City in 2019

101. On February 1, 2019, Edward Soldo (City Director, Transportation, Operations & Maintenance) emailed Kevin Bentley (MTO Chief Engineer) to inquire about whether Mr. Bentley could provide him with information about pavement friction testing and anticipated values for SMA pavements.[186] Mr. Bentley did not immediately respond.

102. Mr. Soldo followed up with Mr. Bentley again on February 11, 2019, and the two talked over the phone on February 12, 2019.[187] By way of emails dated February 12 and 13, 2019, Mr. Bentley provided Mr. Soldo with all MTO records pertaining to the RHVP friction tests (i.e. the 2007 results and the DSM list results).[188] Mr. Bentley copied Ms. Lane on the email to Mr. Soldo and informed Mr. Soldo that Ms. Lane was available to assist in interpreting the MTO data.[189] Mr. Bentley also clarified that the 2007 results were generated from a City request for the testing, that the DSM results were generated in the context of evaluating an aggregate for internal DSM list purposes, and that the key to monitoring friction was to assess the long term trends.[190]

103. On February 13, 2019, Mr. Bentley advised Mr. Soldo that the MTO was willing to conduct further friction testing on the RHVP if the City so wished.[191] Mr. Bentley and Ms. Lane were clear in their evidence that the MTO was available to assist the City in respect of the RHVP, to the extent it was able to do so.[192]

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[186] HAM0028338_0001 (Email from Soldo, February 1, 2019).
[187] HAM0028695_0001 (Email from McKinnon, February 13, 2019); HAM0028727_0001 (Email Note to Self from McKinnon, February 13, 2019); HAM0028689_0001 (Email from Soldo, February 12, 2019).
[188] HAM0028695_0001 (Email from McKinnon, February 13, 2019); HAM0054585_0001 (Email from Soldo, February 13, 2019); HAM0054591_0001 (Email from Bentley, forwarded by Soldo, February 13, 2019).
[189] HAM0028695_0001 (Email from McKinnon, February 13, 2019).
[190] HAM0029270_0001 (Email from Bentley, February 13, 2019); HAM0028695_0001 (Email from McKinnon, February 13, 2019).
[191] HAM0028727_0001 (Email from Bentley, February 13, 2019).
[192] RHVPI Transcript dated September 21, 2022, Evidence of Kevin Bentley (MTO Manager of Engineering at Southwest Region) ("**Bentley Transcript**"), p 10555 (lines 8-15) and p 10528 (lines 2-8);

104. Between February 17 and 19, 2019, Mr. Soldo discussed the 2007 results and the DSM results with City consultants from CIMA. He asked whether CIMA could review the data, identify a "degradation curve" and extrapolate the data to confirm a 2019 friction value for the RHVP.[193]

105. CIMA discussed the request internally, including with Geoffrey Petzold (Project Manager, Transportation, CIMA Edmonton office), who Mr. Malone had identified as the CIMA representative most equipped to provide friction expertise.[194] Mr. Petzold queried the feasibility of such an exercise, and ultimately refused to do it noting that he did not feel comfortable extrapolating friction values out over a 5-year period; much can change month-after-month impacting the accuracy of such an assessment, and in his view results should not be inferred beyond the 6 month mark.[195] He recommended that the City take in-field measurements, which were required to establish a trend into 2019.[196]

106. Despite Mr. Petzold's concerns, Mr. Malone performed the work. In his view, the City was interested in identifying a degradation trend that it should have been informed of, which could be accommodated.[197]

Lane Transcript 2, p 2219 (lines 9-20); RHVPI Transcript dated September 12, 2022, Day 1 Evidence of Edward Soldo (Director of Roads & Traffic at Public Works, City of Hamilton) ("**Soldo Transcript 1**"), p 15215 (lines 1-6).

[193] HAM0036285_0001 (Email from Soldo, February 17, 2019); HAM0048800_0001 (Email from Soldo, February 11, 2019); HAM0036308_0001 (Email from Soldo, February 19, 2019).

[194] CIM0017215 (Email from Malone, January 31, 2019); CIM0016861 (Email from Petzold, September 10, 2018).

[195] RHVPI Transcript dated September 29, 2022, Evidence of Geoffrey Petzold (Project Manager of Transportation, CIMA) ("**Petzold Transcript**"), p 11172 (line 20) – p 11174 (line 6).

[196] CIM0017111 (Email from Salek, February 21, 2019); CIM0017116 (Email from Salek, February 20, 2019); Petzold Transcript, p 11172 (lines 13-19).

[197] CIM0017111 (Email from Salek, February 21, 2019); HAM0036336_0001 (Memo from Soldo to Malone).

107. Mr. Malone concluded that the estimated extrapolated 2019 friction value was FN29, and provided his report to Mr. Soldo on February 26, 2019.[198] The report noted that CIMA had no information about the testing protocol used by the MTO, and without such data they could not confirm whether comparing/merging the two sets of data would be appropriate.[199] Nevertheless, it goes on to find that the estimated extrapolated FN was in fact lower than the friction levels identified by the Tradewind Report.[200] It recommends that in-field testing take place so that the extrapolated results can be confirmed.[201]

108. Also on February 26, 2019, City staff confirmed that the MTO data corroborated the results observed in the 2013 Tradewind Report,[202] and this was relayed to City Councillor Merulla.[203] Councillor Merulla subsequently brings a motion demanding that the Province apologize "for having kept the public in the dark over the MTO's friction testing results, which concurred with the hidden Hamilton staff report during the same period of time compounding the betrayal to City Council".[204]

109. City staff questioned the accuracy of the statement about MTO data corroborating the Tradewind Report findings (noting that MTO had not provided the assessment). However, before it could be corrected, it was confirmed that Councillor Merulla had already relied upon the confirmation.[205]

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[198] HAM0036335_0001 (Email from Malone, February 26, 2019); HAM0036336_0001 (Memo from Soldo to Malone).
[199] HAM0036336_0001 (Memo from Soldo to Malone), p 1.
[200] HAM0036336_0001 (Memo from Soldo to Malone), p 3.
[201] HAM0036336_0001 (Memo from Soldo to Malone), p 4.
[202] This view was shared by Dan McKinnon (General Manager, Public Works), Mr. McGuire and Mr. Soldo (HAM0055170_0001; HAM0054844_0001).
[203] HAM0013756_0001 (Email from Merulla, February 26, 2019).
[204] HAM0006205_0001 (Email from Merulla, March 7, 2019).
[205] HAM0055170_0001 (Email from Eisbrenner, April 15, 2019); HAM0054843_0001 (Email from Zegarac, February 28, 2019).

110. The City did not ask for MTO's views on the legitimacy of the degradation/ extrapolation exercise, and did not request that MTO provide the follow-up assessments for its data.[206]

111. The City and MTO communications continued into March 2019, with helpful[207] discussions between Mr. McGuire and Ms. Lane about the MTO data and MTO's offer to friction test the RHVP. [208] However, although the City remained interested in MTO's offer, by the end of March 2019 (and into April 2019) it still had not decided whether it would proceed with the testing.[209] Mr. Bentley and Ms. Lane made attempts to confirm testing details, including by scheduling a meeting with Mr. McGuire and Mr. Soldo for April 2, 2019.[210] The meeting was cancelled at the request of the City.[211]

112. The City never accepted MTO's offer to test (nor did it confirm that it was declining the offer), despite the fact that the MTO remained prepared to carry it out.[212]

113. ARA performed friction testing on the RHVP between May 19 and 20, 2019.[213] The RHVP was resurfaced on May 21, 2019.[214]

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[206] Soldo Transcript 1, p 15215 (lines 7-18), RHVPI Transcript dated October 24, 2022, Day 4 Evidence of Gord McGuire (Manager of Geomatics & Corridor Management at Engineering Services, Public Works, City of Hamilton) ("**McGuire Transcript 4**"), p 14127 (lines 3-8).
[207] McGuire Transcript 4, p 14129 (line 9) – p 14131 (line 7); RHVPI Transcript dated November 1, 2022, Day 2 Evidence of Edward Soldo (Director of Roads & Traffic at Public Works, City of Hamilton) ("**Soldo Transcript 2**"), p 15204 (line 17) – p 15207 (line 16).
[208] HAM0036528_0001 (Email from Lane, March 20, 2019); McGuire Transcript 4, p 14076, (line 22) – p 14088 (line 10), p 14128 (lines 1-13) and p 14136 (line 11) – p 14137 (line 7).
[209] McGuire Transcript 4, p 14128 (lines 1-25) – p 14129 (line 1) and p 14136 (line 25) – p 14137 (lines 1-5).
[210] HAM0029688_0001 (Meeting invite from Bentley, April 1, 2019); McGuire Transcript 4, p 14136 (lines 11-24).
[211] McGuire Transcript 4, p 14136 (lines 6-20).
[212] Bentley Transcript, p 10555 (lines 8-15); Lane Transcript 2, p 2219 (lines 9-20).
[213] HAM0009630_0001 ((Bain, *Surface Pavement Investigation Methodology Report: Red Hill Valley Parkway, City of Hamilton*, (September 11th, 2019)); HAM0009628_0001 (RHVP 2019 Data 1); HAM0009629_0001 (RHVP 2019 Data 2); HAM0009627_0001 (RHVP 2019 Sand Patch Data).
[214] HAM0061330_0001 (May 6, 2019, media release); HAM0014850_0001 (Email from Olszewski, April 12, 2019); HAM0061330_0001 (Email from Graham, May 6, 2019); HAM0055533_0001 (Email from Recine, May 20, 2019): The resurfacing began on May 21, 2019, and additional resurfacing was done throughout the summer of 2019.

PART C – APPLICATION TO INQUIRY

(I) THE MTO FRICTION RESULTS WERE ACCEPTABLE

(a) The friction values were reasonable

114. The chart below sets out the average friction results obtained by MTO on the RHVP in 2007 ("2007 results"), as well as the average friction results collected by the MTO between 2008 and 2014 ("DSM results"):[215]

Chart 1

MTO FRICTION TEST RESULTS – AVERAGE FN PER LANE
(measured at 90 km/hr)

lane	2007	2008	2009	2010[216]	2011	2012	2014
SB 1	33.9 MTO2228	40.3 MTO0011	38.9 MTO5232	36.9 MTO34406	34.8 MTO34406	34.4 MTO7832	31.7 MTO22945
SB 2	33.8 MTO2229	38.2 MTO0012	34.5 MTO5229	34.2 MTO34405	32.4 MTO34405	31.2 MTO7829	30.5 MTO22946
NB 1		41.2 MTO0013	39.4 MTO5230	37.1 MTO34407	35.0 MTO34407	35.4 MTO7830	33.2 MTO22943
NB 2		38.7 MTO0014	37.1 MTO5231	33.7 MTO34408	34.3 MTO34408	32.7 MTO7831	30.7 MTO22944

[215] This chart, as well as others in this section, has been compiled from the source documents referenced in each entry, and is set out as a reference tool. In the event of discrepancies between the chart and the source documents, the source documents should be preferred.
[216] These reflect the 2010 results after being adjusted to their approximate levels testing at 90 km/hr.

115. The averages obtained for the sections of the two southbound lanes tested in the context of the 2007 results were above FN30, at FN33.9 and FN33.8. MTO personnel viewed these values as being much higher than the SMA pavements that had presented low early-age friction issues.[217] As noted, the request for testing did not arise in the context of an identified pavement performance concern, but was of a general nature to shed light on the frictional qualities of the RHVP before it opened to the public. The 2007 results were viewed as acceptable by MTO personnel.

116. The DSM results were reviewed by MTO personnel to assess the suitability of the aggregate for the DSM list. In each of the years in question, the average FNs for all 4 lanes were above FN30.[218] These values were acceptable for the inclusion of the aggregate on MTO's DSM list in 2009, and its continued inclusion thereafter.[219]

117. As noted, some MTO witnesses provided evidence about reviewing average FNs as against individual values in certain cases to ensure there are no significant deviations in values or patterns of concern (e.g. many consecutive low FNs could be indicative of a friction issue, even if the overall average is acceptable). Such deviations or patterns are not present in any of the MTO friction tests. As amongst the 26 lane tests conducted between the 2007 results and the DSM results, there are only 4 lane tests that show any back-to-back FNs below FN30, which are set out in the chart below. In each case there are no more than two consecutive results below FN30 (although in 2014, there were two such instances for NB lane 2). Where numbers do come in below FN30, they are in close physical proximity to each other, and are in the high FN20s.

[217] Lane Transcript 1, p 2051 (line 17) – p 2053 (line 5) and p 2093 (line 23) – p 2094 (line 24).
[218] As with other assessments, the average FN value is typically assessed for DSM list purposes.
[219] Lane Transcript 1, p 2093 (line 23) – p 2094 (line 24); Raymond Transcript 2, p 2449 (line 5) – p 2450 (line 21).

Chart 2 MTO RHVP FRICTION TEST RESULTS – CONSECUTIVE FNs BELOW 30					
Year	**Lane**	**FN**	**FN**	**Distance between FNs**	**Source**
2007	Southbound Lane 2	28.6	29.7	176 metres	MTO0002229
2012	Southbound Lane 2	28.1	29.5	600 metres	MTO0007829
2014	Northbound Lane 2	27.7	27.7	193 metres	MTO0022944
2014	Northbound Lane 2	27.9	27.4	181 metres	MTO0022944
2014	Southbound Lane 2	27.8	26.1	261 metres	MTO0022946

118. Based on these results, there is no basis on which to conclude that there was problematic friction on any part of the tested section of the RHVP. Neither the 2007 results nor the DSM results show any extended pattern of low FNs, nor do they present the types of deviations and patterns that might have created concern.

(b) The decline in friction was not significant and was consistent with normal wear and tear

119. There is no dispute that the DSM results show a decline in friction levels between 2008 and 2014. This decline is consistent with normal wear and tear and is not significant.[220] The decline was also gradual in nature and there were no significant jumps from one year to the next.[221]

120. The *rate* of friction decline also decreased throughout the years, with that reflected in early DSM results (i.e. 2008-2011) being much greater than that reflected in the later

[220] RHVPI Transcript dated February 24, 2023, Evidence of Dr. David K Hein (Principal Engineer/President 2737493 Ontario Limited) ("**Hein Transcript"**), p 16300 (line 15) - p 16301 (line 4); Lane Transcript 2, p 2174 (line 8) – p 2175 (line 22) and p 2251 (line 18) – 2252 (line 10); Senior Transcript, p 2807 (line 13) – p 2810 (line 14); Bentley Transcript, p 10545 (line 17) – p 10546 (line 13).
[221] Hein Transcript, p 16301 (line 25) – p 16302 (lines 1-2); Lane Transcript 1, p 2022 (lines 1-5), p 2129 (line 1) – 2030 (line 18) and p 2132 (lines 1-8); Petzold Transcript, p 11182 (line 16) – p 11185 (line 17).

DSM results (i.e. 2011-2014).[222] The chart below summarizes friction changes from year to year, as well as the changes in early DSM results:

Chart 3

MTO RHVP FRICTION TEST RESULTS – CHANGES IN AVERAGE FNs

	YEARLY						3-YEAR		TOTAL	
lane	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2014[223]	2008-2011	2011-2014	**2008-2014**	**2007-2014**
SB1	+6.4	-1.4	-2.0	-2.1	-0.4	-2.7 (-1.35/ yr)	-5.5	-3.1	-8.6	-2.2
SB2	+4.4	-3.7	-0.3	-1.8	-1.2	-0.7 (-0.35/ yr)	-5.8	-1.9	-7.7	-3.3
NB1		-1.8	-2.3	-2.1	+0.4	-2.2 (-1.1/yr)	-6.2	-1.8	-8.0	N/A
NB2		-1.6	-3.4	+0.6	-1.6	-2.0 (-1.0/yr)	-4.4	-3.6	-8.0	N/A

121. MTO personnel did not identify any friction jumps of concern from one year to the next, but as noted the friction decline as initially assessed between 2009 and 2010 was flagged as potentially problematic.[224] The initial 2010 results were ultimately not reflective of true in-field friction levels, and once the test speed discrepancy was discovered, the initial 2010 results were replaced with revised 2010 results.[225] The revised 2010 results did not present any concerns for MTO.[226]

[222] Flintsch Transcript 2, p 15696 (lines 9-13); Lane Transcript 1, p 2022 (lines 1-5) and p 2129 (line 1) – p 2030 (line 18); Lane Transcript 2, p 2174 (line 8) – p 2175 (line 22); Lee Transcript, p 3052 (lines 9 – 16); Petzold Transcript, p 11182 (line 16) – p 11185 (line 17).
[223] As there were no skid tests conducted by the MTO in 2013, this column reflects the measured changes in FN over a two year period, and sets out the associated yearly change average.
[224] The averages for the southbound lanes 1 and 2 appeared to have decreased by FN 4 and 2.3, rather than approximately FN 2 and 0.3, respectively; the averages for northbound lanes 1 and 2 appeared to have decreased by FN 4.3 and 5.4, rather than approximately 2.3 and 3.4, respectively.
[225] When measured at 100 km/hr, actual results were as follows: SB1 – FN34.9 (MTO34022); SB2 – FN32.2 (MTO34019); NB1 – 35.1 (MTO34020); NB2 – 31.7 (MTO34021).
[226] Lane Transcript 1, p 2129 (lines 1-25) and p 2132 (lines 4-8).

(c) Friction levelled out after the 2012 friction test

122. In addition to the decreasing rate of decline, it is without question that friction levels did ultimately level out. Ensuring that this occurs is one of the central purposes of monitoring aggregates on the DSM list.[227] In the case of the Demix aggregate, the DSM results show a leveling out at some point after the 2012 friction test,[228] for which results were just marginally higher than the 2014 results (and no results exist for 2013).[229]

123. In further support of the levelling out of friction on the Demix aggregate are the results from the 2019 friction test conducted by Applied Research Associates ("2019 ARA results"). When comparing the 2014 results collected by the MTO with the 2019 ARA results, it is clear that there were no material changes in friction levels between 2014 and 2019 (in respect of the section of the RHVP that was tested for both), and that FNs did not decrease during that period. In fact, FNs are slightly higher in 2019 than 2014.[230] The numbers suggest that the friction on the RHVP stabilized at some point prior to 2014.[231]

124. Although some MTO witnesses spoke about a desire for the friction levels of premium DSM list aggregates to level out after 2-3 years,[232] and in the case of the Demix aggregate it was seen at some point after the 4 year mark, this was satisfactory for DSM list purposes. As such, there was no need to work with Demix or otherwise take action that might have precipitated the aggregate's removal from the DSM list.

[227] Lee Transcript, p 3053 (line 1) – p 3055 (line 7).
[228] Flintsch Transcript 2, p 15695 (line 7) - p 15696 (line 5).
[229] Flintsch Transcript 2, p 15695 (lines 13-14); Uzarowski Transcript 7, p 6439 (lines 6-21): Golder was also of the view that the MTA data showed stabilizing friction numbers, consistent with what is observed on other SMA pavements.
[230] Lane Transcript 2, p 2244 (lines 14-25) and p 2247 (lines 3-20).
[231] Lane Transcript 2, p 2245 (lines 4-19).
[232] Senior Transcript, p 2836 (line 24) – p 2837 (line 4); Gorman Affidavit, para 7.

125. The decreasing rate of friction decline throughout the years and the ultimate leveling out of friction levels was acknowledged by both friction experts called at the Inquiry. Dr. Flintsch acknowledged that by 2011-2014, friction was decreasing at a much slower rate than it had been in prior years.[233] He also accepted that it levelled out at some point after the 2012 friction test.[234] Although he noted that the FN results showed a 20% reduction between 2008 and 2014 and classified the results as being "relatively low", he acknowledged that these conclusions were not evident from a review of the DSM results themselves.[235] Rather, they were informed by his opinion on the following: the wet accident collision rate, the friction results in the Tradewind report, excessive driver speeds, and the geometry of the freeway.[236]

126. Dr. Hein acknowledged that the 2014 MTO friction results were completely acceptable.[237] He noted that none of the average lane values were below FN30[238] and that friction levels appear to have stabilized as of 2014.[239] In his opinion, the individual test results below FN30 were not a concern as they were minor and inconsequential deviations.[240]

127. Dr. Hein was also of the view that the rate of decline of the friction results over the years was very typical for similar aggregate sources in Ontario.[241] The report of Dr. Hassan Baaj corroborates the evidence of Dr. Hein on this point. Dr. Baaj viewed the drop in friction

[233] Flintsch Transcript 2, p 15694 (lines 9-13).
[234] Flintsch Transcript 2, p 15695 (line 7) - p 15696 (line 5).
[235] Flintsch Transcript 2, p 15639 (line 25) – p 15640 (line 16).
[236] Expert Report of Dr. Gerardo W. Flintsch dated November 2022 ("**Flintsch Report**"), pp 5-6, 30; Flintsch Transcript 2, p 15654 (line 24) – p 15655 (line 4).
[237] Hein Transcript, p 16300 (line 15) - p 16301 (line 4); Hein Report, p 4, para 13
[238] In Dr. Hein's view, friction results below FN20-25 would be seen as "low". See Hein Transcript, p 16389 (lines 5-11); Hein Report, p 7, para 22.
[239] Hein Transcript, p 16300 (line 15) - p 16301 (line 4); Hein Report, p 4, para 18.
[240] Hein Transcript, p 16419 (lines 8-16); Hein Report, p 7, para 20.
[241] Hein Transcript, p 16391 (lines 5-19).

between 2008 and 2014 as within the normal range for paving projects that use similar materials and service lives.[242]

128. Based on evidence from fact witnesses, as supported by expert evidence, it is clear that the RHVP friction levels as established by the 2007 results and the DSM results were acceptable in and of themselves and were not at such a level that should have spurred (or did spur) concerns. They do not "corroborate" the existence of any issues related to the RHVP, as set out in the Tradewind Report or otherwise.

129. Indeed, the MTO data, which was generated using a locked-wheel ASTM trailer, cannot reliably be compared with the GripTester results set out in the Tradewind Report. The GripTester and the ASTM trailer are completely different machines, which use different technology and measure friction in different ways.[243] The results of the two testing methods do not return immediately comparable results,[244] and there are difficulties in comparing friction test results obtained by using different testing devices at different speeds.[245]

130. This was acknowledged by the Inquiry's friction experts (and MTO witnesses). Dr. Flintsch confirmed that he would not recommend converting GripTester results to a form that could be compared with locked-wheel results as it is not standard and cannot be used in all circumstances.[246] Dr. Hein stated that converting friction values is particularly difficult when passing the data of one device (e.g. GripTester) through other non-similar devices

[242] Expert Report of Dr. Hassan Baaj dated February 2023 ("**Baaj Report**"), p 25, section 3.3.
[243] Flintsch Transcript 2, p 15552 (lines 19-25).
[244] Flintsch Transcript 2, p 15553 (lines 1-3).
[245] Flintsch Report, p 10, section 2.1.2.
[246] Flintsch Transcript 2, p 15579 (line 6) – p 15580 (line 12).

(e.g. locked-wheel), and notes that there are authoritative studies that show that correlations cannot be reliably made.[247]

(d) MTO would not have acted differently had the RHVP been a Provincial highway

131. One topic that was canvassed during the Inquiry is whether, given the DSM results, the MTO would have placed the RHVP in a monitoring program if it had been a Provincial highway. This must be answered in the negative.

132. Had the Demix aggregate remained on the DSM list, MTO would have continued to perform friction testing in subsequent years.[248] Ongoing testing over the long term is conducted for DSM list purposes "just to keep an eye on the data".[249] This is particularly so for a new aggregate that has not yet been heavily used on MTO contracts.[250] Long-term testing ensures that the S&A section can confirm that aggregate friction levels ultimately plateau such that the aggregate can offer the longevity expected of MTO's premium materials.[251]

133. If friction had not ultimately plateaued in the case of the RHVP test site (or any other site tested for DSM list purposes), MTO witnesses spoke to possibilities for next steps. As set out in Part A, delisting of the aggregate would not necessarily occur, but rather MTO would work with the proponent to improve the aggregate and may consider additional steps such as placing conditions on the aggregate's use. This was not necessary for the Demix aggregate.

[247] Hein Report, p 14, paras 44-5; Hein Transcript, p 16282 (lines 1-12) and p 16339 (lines 1-12).
[248] Gorman Affidavit, paras 27-8.
[249] Gorman Transcript, p 2873 (lines 12-20).
[250] Gorman Affidavit, para 24.
[251] Lee Transcript, p 3122 (line 5) - p 3123 (line 25).

134. Nothing further would have been done in terms of monitoring had the RHVP test site been a Provincial facility. The same procedures would apply in handling an underperforming aggregate on the DSM list.

135. It is critically important to understand that continued "monitoring" for DSM list purposes (i.e. yearly friction testing) is standard procedure within the S&A section. It should not be conflated with regional staff "monitoring" identified in-field issues. As set out in Part A, above, friction testing that is carried out at the request of a regional Head may not ultimately determine whether low friction has contributed to the underlying road concern. The region may then decide to take additional steps, which could consist of friction testing the following year.[252] It could also analyze accident rates, wet accidents, geometric designs, or take numerous other steps to further its investigation or monitor a road within its jurisdiction. All such action would be taken in the context of resolving ongoing and existing road problems. The S&A section would not be involved.

(II) MTO LACKED INFORMATION ABOUT FRICTION DEMANDS ON THE RHVP

(a) Friction demands and friction threshold systems

136. Where in-field concerns are identified, the Inquiry's fact witnesses stressed that determining whether friction levels are subpar in general will depend on numerous roadway-specific characteristics. This view was supported by the friction experts called at the Inquiry, who noted that friction demands can vary significantly within a road network and often are not constant across the length of the road itself.[253]

137. In Dr. Flintsch's experience, friction demands will vary with factors that include whether a road is straight or curved, the amount of traffic on the road, driver speeds, the

[252] Raymond Transcript 2, p 2406 (line 5) – p 2407 (line 25).
[253] Flintsch Transcript 2, p 15588 (lines 8-22).

types of vehicles on the road, climactic conditions, the geography of the roadway and the surrounding areas, and more.[254] As noted above, Dr. Flintsch's report characterizes the friction on the RHVP as being "relatively low",[255] however, he testified that this finding was merely intended to reflect his view that there was a friction demand issue based on the "specific conditions" of the RHVP.[256] He agreed that contextual information such as collision history and the geometry of the freeway was critical to this conclusion.[257]

138. That friction demand warrants a comprehensive analysis is also made clear in the report of Dr. Hein. Factors affecting appropriate friction levels could include roadway design such as curves and interchanges, pavement characteristics, traffic and speed, environment and climactic conditions, and the existence of visual distractions.[258]

139. Similarly, in terms of systems based on set friction thresholds, expert evidence introduced at the Inquiry supports the principle that there is no one-size-fits-all friction threshold system that would be appropriate for all roadways. FN thresholds that may suffice in certain cases may be completely inappropriate when applied to more difficult roads with certain in-field issues such as those experiencing high collision rates.[259] Even where such systems have been implemented, there are no guarantees that the defined thresholds will eliminate all, or even most, friction-related risks.[260] Simply put, friction demand is independent of any threshold applied.[261]

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[254] Flintsch Transcript 2, p 15588 (lines 8-22) - p 15589 (lines 1-8) and p 15594 (line 19) - p 15595 (line 6).
[255] Flintsch Report, p 29.
[256] Flintsch Transcript 2, p 15654 (line 18) - p 15655 (line 4).
[257] Flintsch Transcript 2, p 15654 (line 18) - p 15655 (line 4).
[258] Hein Report, pp 16-17, para 52 and Table 2.
[259] Flintsch Transcript 2, p 15539 (line 15) – p 15540 (line 1) and p 15588 (lines 8-22); Hein Report, p 12, para 39.
[260] Flintsch Transcript 2, p 15539 (line 15) – p 15540 (line 1) and p 15665 (lines 4-12); Hein Transcript, p 16301 (line 20) – p 16302 (line 2); Hein Report, p 7, para 23.
[261] Flintsch Transcript 2, p 15594 (line 19) – p 15595 (line 3), and p 15589 (lines 1-8).

(b) MTO had no information about RHVP friction demands and was not asked to assist with assessing friction demands

140. Although MTO conducted several years of friction testing on a section of the RHVP, it did so in the context of monitoring aggregate performance and relied only on the following information: the RHVP posted speed (not actual driver practices/ speeds), point-in-time temperatures and testing locations.[262] It was acknowledged by Dr. Flintsch that the MTO test results did not rely on any RHVP-specific friction demand information.[263] Without more, MTO personnel were not capable of opining on the adequacy of friction on the RHVP and whether friction supply met the necessarily varying friction demands of the road.

141. The MTO was not aware of any specific in-field concerns on the RHVP and was not asked to assist with any investigations into same. Although Golder representatives contacted MTO personnel regarding the RHVP in 2007 and again 2013, no specific in-field issues were relayed to MTO on either occasion. As such, there was no reason for MTO personnel to seek out information about the specific friction demands of the municipal roadway.

(c) Friction management on the RHVP is a City responsibility

142. MTO is not responsible for the road networks of Ontario municipalities. It was reasonable to assume that the City, which itself manages an extensive road network, had implemented appropriate checks and balances in order to monitor friction and ensure road safety. This is particularly so given that the City is a sophisticated municipality with well-

[262] Senior Transcript, p 2841 (line 10) and p 2843 (line 7); Marciello Transcript, p 2659 (line 11) – p 2660 (line 2).
[263] Flintsch Transcript 2, p 15696 (lines 19-23).

defined vendor engagement practices, that did in fact engage reputable consultants in the development, construction and ongoing assessment of the RHVP.[264]

143. During the course of the Inquiry, certain City witnesses spoke about the difficulties of developing friction management programs at the municipal level, pointing to the lack of a Provincially-developed friction threshold system on which the City could rely.[265] This is simply an abdication of responsibility by the City. City personnel were well aware that consultants with friction expertise were available to provide it with context-specific assistance (who had in fact provided the City with prior friction-related advice or offers to assist with same).[266] For instance, on December 21, 2018, Dr. Uzarowski offered Mr. McGuire assistance in terms of understanding friction requirements given that there was no "clear standard" in Ontario, which was not accepted.[267]

144. Further, before the RHVP opened to the public, the City was advised that it should carry out regular friction testing on the road on a go-forward basis. A Pavement Sustainability Plan prepared by Stantac recommended that friction testing be carried out every 1 to 2 years.[268] Although Gary Moore and other City personnel knew of the recommendation, it was never implemented. City witnesses disputed which section would be responsible for the testing, but Mr. Moore's evidence was that City Council refused the

[264] RHVPI Transcript dated May 5, 2022, Day 2 Evidence of Marco Oddi (former City of Hamilton Manager of Construction and Engineering Services) (**"Oddi Transcript 2"**), p 1174 (line 22) - p 1176 (line 6).
[265] RHVPI Transcript dated October 21, 2022, Day 3 Evidence of Gord McGuire (Manager of Geomatics & Corridor Management at Engineering Services, Public Works, City of Hamilton) ("**McGuire Transcript 3**"), p 14008 (line 8) – p 14009 (line 21).
[266] McGuire Transcript 3, p 13927 (lines 8-18) and p 13974 (line 21) – p 13975 (line 20).
[267] HAM0035749_0001 (Email from Uzarowski, December 21, 2018); McGuire Transcript 3, p 13974 (line 21) – p 13975 (line 20).
[268] HAM0037751 (Draft Stantec Pavement Sustainability Plan for Lincoln Alexander & Red Hill Valley Parkways), p 6; HAM0000320 (City of Hamilton Lincoln Alexander Parkway and Red Hill Valley Project Sustainability Plan, Appendix A) at p 101.

recommendation in any event due to its cost, which was expected to be $5000 every 1 to 2 years.[269]

145. This actually reinforces one of MTO's concerns in terms of developing or publishing a friction threshold system. It is crucial that over-reliance on a simple numerical system in lieu of comprehensive road assessments by qualified professionals and in-field monitoring is avoided. Risks and liabilities associated with over-reliance (or blind reliance) on set FN thresholds are heightened where friction complexities are not understood by road owners, contractors and drivers.[270] Those risks can be mitigated, of course, where the friction-related characteristics of aggregates are pre-screened by individuals with the requisite expertise to do so, as is done in MTO's operation of the DSM list.

(III) DISTRIBUTION OF ALL MTO FRICTION RESULTS WAS REASONABLE

146. MTO's handling and distribution of the 2007 results and the DSM results was informed by the information in its possession and was inherently reasonable in the circumstances.

(a) Distribution of the 2007 Friction Test Results

147. The 2007 friction test was conducted pursuant to a request from Dr. Uzarowski on behalf of the City. The purpose of the test was to measure general friction levels on a limited section of the RHVP prior to its opening, and was conducted further to Dr. Uzarowski learning of industry/MTO concerns with early-age friction on some SMAs.

148. As the point person in fielding the request, Mr. Raymond handled the distribution of results on behalf of MTO. On November 18, 2007, the day after the friction test had

[269] RHVPI Transcript dated May 9, 2022, Day 2 Evidence of Gary Moore (City of Hamilton Director of Engineering Services, Public Works) ("**Moore Transcript 1**"), p 1618 (line 20) – p 1619 (line 8).
[270] Lane Transcript 1, p 2005 (line 1) - p 2006 (line 21); MT00011556 (Presentation by Lane on Use of Friction Number as a Performance Measure on MTO Contracts), p 3.

been generated, he emailed the results to Dr. Uzarowski with a copy to Mr. Delos Reyes. Mr. Raymond advised that he was available to answer questions about the results and asked that the results be shared with those involved in the RHVP project as necessary.

149. In expressing a willingness to assist with understanding the results and encouraging the circulation of the results as necessary, Mr. Raymond's handling and distribution of the 2007 results was abundantly appropriate. Having not received any follow-up from the City or Golder regarding the 2007 results, it was reasonable for Mr. Raymond to conclude that there was no ongoing friction-related concerns in respect of the RHVP at the time.

(b) Distribution of the DSM List Friction Test Results

150. Unlike the 2007 results, the DSM results were requested by the S&A section. Mr. Marciello sent the results back to the S&A section Head and Geologist for DSM list management purposes. He also provided a copy to his direct manager in the P&F section to keep her apprised of completed work deliverables.

151. As the testing was conducted to measure the qualities of the Demix aggregate (and not to investigate any in-field concerns), the DSM results were not shared with the City as the 2007 results had been. However, information about the status of the DSM list application was distributed to Demix per standard procedure.[271] Demix was informed of the satisfactory friction 2008 and 2009 friction results, and that additional friction testing that would be conducted periodically to assess the aggregate's suitability for continued inclusion on the DSM list.

[271] Gorman Affidavit, para 13.

152. MTO's distribution of its DSM results is grounded in the fact that DSM friction testing is limited in nature and primarily intended to assess long-term aggregate trends. It is not conducted to identify whether a road's friction levels meet its friction demands. Based on the limited value of numerical friction results on their own, and in some cases the limited understanding of friction management by DSM list proponents, friction testing results are generally only shared with paving contractors if they request results from their own paving projects.[272]

153. MTO has no records indicating that the DSM results were provided to Dufferin or Demix. However, neither Dufferin nor Demix requested the DSM results from the MTO at any time during the period the Demix aggregate was included on the DSM list (nor did anyone from the City).[273]

(c) Escalation of the 2010 Friction Test Results

154. Although MTO's DSM list practice is as set out above, the MTO did inform the City of its testing of the RHVP for DSM list purposes in 2010. Based on the combined evidence of Ms. Lane, Dr. Uzarowski and Mr. Moore, it must be accepted that Ms. Lane informed Mr. Moore of the apparent drop in FNs between 2009 and 2010 shortly after November 15, 2010. This was a prudent way to address the matter.

155. It follows that, had similar issues arisen in the future, they would have been handled in the same manner and the City would have been informed. Similar issues did not arise. As a result of the DSM list assessments, MTO personnel concluded that Demix was in production of a quality aggregate. The aggregate maintained its status on the DSM

[272] Lane Transcript 1, p 1950 (line 25) – p 1951 (line 16).
[273] Gorman Affidavit, pp 6-7, para 14.

list until it was removed by the quarry in 2016, and there was never a need to work with Demix to improve aggregate quality or to initiate delisting of the aggregate.

(d) No Other Concerns Requiring Escalation

156. At no time were pertinent MTO personnel aware of any concerns on behalf of the City or its contractors regarding the RHVP, for which access to the MTO data could have assisted (with the exception of the 2007 results, which had been appropriately distributed).

157. Although Golder directed its 2013 request for friction testing to Mr. Lee, no specific in-field friction issue was identified by them. On its face, the 2013 request does not identify any such issue. The request was extensive and general in nature, and pertained to not only the entirety of the RHVP mainline and certain ramps, but also inner-city areas and a large section of the LINC. Mr. Lee did not at the time highlight that prior DSM list testing of the Demix aggregate had taken place as he was not aware of the DSM results at the time, but they in any event only pertained to a section of the RHVP. They certainly did not set out friction results for any RHVP ramps, the LINC or inner-City areas.

158. In the circumstances, the provision of a referral to a friction testing company close by was appropriate. Having not heard back on the matter, he quite reasonably assumed that the City's friction testing needs had been met.

159. Ultimately, MTO personnel were not alerted to any specific friction, safety and/or performance concern in respect of the RHVP, and there was no basis on which they should have assumed that such a concern had developed. They had no reason to analyze the MTO data for any purpose other than assessing aggregate quality to determine whether the Demix product was a premium aggregate worthy of inclusion on the DSM list. It was.

(IV) EARLIER DISSEMINATION OF THE DSM RESULTS WOULD NOT HAVE TRIGGERED ACTION

160. On February 12, 2019, all of the MTO's friction testing records, being the 2007 results and the DSM results, were provided to the City. Although the 2007 results had already been provided to the City via Golder, there are no records indicating that MTO provided the City with the DSM test records (although, as noted, Ms. Lane informed Mr. Moore about the DSM test results in or around 2010).

161. Had disclosure of the DSM results to the City occurred at an earlier juncture, it must be concluded that the City would not have been prompted to change its conduct in respect of monitoring or otherwise assessing the safety of the RHVP. This inference can be drawn from: (a) the City's treatment of other (non-MTO) RHVP reports received prior to 2019 and its relative inaction; (b) the City's treatment of other previously provided MTO information; and (c) the City's handling of the MTO data when it was provided in 2019.

(a) The City's Treatment of Other Reports Relating to the RHVP

162. A significant portion of the Inquiry was spent examining various reports provided to the City in respect of the RHVP. These reports contain a wealth of analysis and many recommendations. They were compiled at the request of the City in relation to defined issues and provide contextual analysis prepared by skilled consultants. This can be contrasted with MTO's records, which consist of skid trailer test results in the form of raw data, without any associated analysis or application. In addition, many of the reports set out recommendations or identify areas of concern, unlike the MTO data.

163. Although not an exhaustive account of the reports and advice received by the City in respect of the RHVP, the below are examples of the information provided to the City by its consultants prior to the MTO's disclosure in February 2019:

164. 2013 CIMA Report, the 2014 Golder Report and The Tradewind Report (as disclosed to the City in 2014) – On September 16, 2013, CIMA delivered its final 2013 Report to the City.[274] With respect to friction testing, CIMA recommended: "Because of the high proportion of wet surface condition and SMV collisions, the City could consider undertaking pavement friction testing on the asphalt to get a baseline friction coefficient for which to compare to design specifications".[275]

165. On November 20, 2013, Golder arranged for Tradewind Scientific, a UK based company, to conduct friction testing on the RHVP using a griptester machine.[276] On January 31, 2014, Dr. Uzarowski emailed Gary Moore (Director of Engineering Services at Public Works) an "updated draft report on the conditions of the pavement on the RVHP 6 years after construction" (i.e. the Golder Report), which attached the Tradewind Scientific Report as an exhibit.[277] The Golder Report stated: "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".[278]

166. Mr. Moore testified that, when he received the Tradewind Report in January 2014, he was not concerned with its conclusion that friction levels on the RHVP were below a particular investigatory standard (while friction levels on the LINC were not). He felt that because Tradewind applied UK friction standards, which did not apply in the Canadian context, the Tradewind results were "inconclusive".[279]

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[274] CIM0008089.0001 (CIMA Red Hill Valley Parkway Safety Review, September 2013).
[275] CIM0008118.0001 (CIMA Red Hill Valley Parkway Safety Review Draft, July 2013), p 47.
[276] GOL0001113 (Friction Testing Survey Summary Report), pp 4, 12.
[277] GOL0002980 (Email from Uzarowski re: 13-1184-0026 6 Year Review of RHVP Draft Report, January 31, 2014); GOL0002981 (Red Hill Valley Parkway - Performance Review After 6 Years in Service).
[278] GOL0002981 (Red Hill Valley Parkway - Performance Review After 6 Years in Service), p 10.
[279] RHVPI Transcript dated July 18, 2022, Day 4 Evidence of Gary Moore (City of Hamilton Director of Engineering Services, Public Works) ("**Moore Transcript 4**"), p 8434 (line 21) – p 8435 (line 12) and p 8461 (line 21) – p 8462 (line 7).

167. No efforts were taken to arrange for follow-up testing that Mr. Moore would consider conclusive, or friction-related remedial work, subsequent to the City's receipt of the Tradewind Report and the 2013 CIMA report.

168. The 2015 CIMA Report and the Public Works Committee Report – CIMA was engaged to report on the RHVP again in 2015. On October 29, 2015, Mr. Moore reviewed a draft of the 2015 CIMA Report and proposed revisions. He urged CIMA to delete an entire subsection that identified "Perform Friction Testing" as a potential countermeasure. He commented "There is no basis, nothing to compare to and no other agency in Ontario including the MTO doing this! It means absolutely nothing, except proving potential exposure to legal actions and confusion!".[280] In response to a recommendation to conduct friction testing that was set out later in the report, Mr. Moore commented: "I don't have any frame of reference to pass or fail this against".[281] A recommendation for friction testing remained in the final version of the 2015 CIMA Report, which was finalized on November 20, 2015.[282]

169. After receipt of the draft 2015 CIMA report, a staff report was drafted for the City's Public Works Committee, which reiterated recommendations that included RHVP friction testing.[283] Rather than accept the recommendation, Mr. Moore commented: "What is friction testing going to tell you if, you don't have anything to compare it to. There's no provincial data base or guideline. The MTO will never discuss this with you because it opens up an entire line of liability on every road".[284]

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[280] HAM0000690_0001 (RHVP Detailed Safety Analysis Final Report, October 2015), p 41.
[281] HAM0000690_0001 (RHVP Detailed Safety Analysis Final Report, October 2015), p 54.
[282] HAM0000700_0001 (Email from David Ferguson re: Confidential LINC/RHVP Report, dated November 26, 2015); HAM0000701_0001 (RHVP Detailed Safety Analysis Final Report, November 2015); HAM0000702_0001 (RHVP Detailed Safety Analysis Final Report, November 2015).
[283] CIM0010146 (Email from Giovani Bottesini re: B000558 - RHVP Draft Report, September 6, 2015); CIM0010146.0001 (RHVP Detailed Safety Analysis Draft Report, September 2015); HAM0043023_0001 (PWC Report, Lincoln Alexander & RHVP Safety Review), pp 1-2.
[284] HAM0043023_0001 (PWC Report, Lincoln Alexander & RHVP Safety Review), pp 1-2.

170. Mr. Moore downplayed the need for additional friction assessments or work, knowing that this had been a recommendation of the 2015 CIMA Report, and instead informed the Public Works Committee that the MTO had performed friction testing on the RHVP in 2007, that the results were at or above what MTO typically expected from high grade friction mixes, that there was subsequent testing five years later in approximately 2012-2013, and that the road was holding up exceptionally well (despite his view that the Tradewind results were "inconclusive").[285] At the same time, Mr. Moore confirmed that the quality of the RHVP was above any 400 series highway.[286]

171. At no point in the two-year period following the City's receipt of the 2015 CIMA Report was friction testing carried out on the RHVP. This was despite the City's receipt of correspondence from the Lakewood Beach Community Council in which it was asked to perform friction testing on the RHVP as a short-term safety option, as well as various inquiries from The Hamilton Spectator.[287]

172. The 2017 Golder Pavement Evaluation – On December 6 and 7, 2017, Golder conducted a pavement evaluation of the surface frictional properties of the RVHP for the City, which was presented to City staff on March 9, 2018 (along with the Tradewind Scientific Report).[288] Dr. Uzarowski then met with Gord McGuire to discuss RHVP and the

[285] RHVPI Transcript dated July 19, 2022, Day 5 Evidence of Gary Moore (City of Hamilton Director of Engineering Services, Public Works) ("**Moore Transcript 5**"), p 8610 (line 20) – p 8611 (line 14).
[286] https://pub-hamilton.escribemeetings.com/Meeting.aspx?Id=a0511623-f6f9-4916-943e-4807e728745e&Agenda=Agenda&lang=English#10071 (City of Hamilton Public Works Committee Meeting Recording, December 7, 2015) at 1:30:37 – 1:30:47.
[287] HAM0043583_0001 (PWC Report 16-002), p 2; RHV0000672 (PWC Minutes 16-002), pp 2-3; HAM0000994_0001 (Email from Jasmine Graham re: Reporter Questions, May 26, 2017).
[288] HAM0001073_0001 (Golder Proposal for Evaluation of Pavement Surface and Aggregates), pp 1-2.; HAM0001072_0001 (Email from Uzarowski, November 23, 2017); HAM0001073_0001 (Golder Proposal for Evaluation of Pavement Surface and Aggregates), pp 1-2; GOL0001457 (Handwritten note maintained by Golder); Meeting attended by Gary Moore, Micke Becke, Marco Oddi, Dennis Perusin, Susan Jacobs, Rick Andoga and Shebib Rich; GOL0005970 (Email from Uzarowski, March 14, 2018): This was confirmed by notebook entries from both Dr. Uzarowski and Mr. Becke from the same date: GOL0007414 (Notebook entries of Uzarowski, pp 74, 76-79; HAM0061788_0001 (Notebook Entries of Becke), p 60.

2017 Golder Pavement Evaluation results on December 18, 2018 and advised him that the concern about skid potential on the RHVP was still valid. Dr. Uzarowski then provided Mr. McGuire with contact information and background on options for shot blasting and skid abrading on the RHVP,[289] and offered to assist with how to understand and assess FN requirements in Ontario. Dr. Uzarowski's offer was not accepted and no arrangements were made at the time to implement any measures to enhance friction on the RHVP.[290]

173. The Tradewind Report (as disclosed to the City in 2018) – In June 2018, Gord McGuire replaced Mr. Moore as the City's Director of the Engineering Services division. Mr. McGuire discovered the Tradewind Report on September 26, 2018, and the Golder Report on September 27, 2018.[291] Mr. McGuire's evidence was that he did not have any concerns with the fact that the Tradewind report recommended more testing and that no testing had been carried out between 2014 and 2017. He understood the three-year gap as possibly being an information-gathering period.[292]

174. On December 3, 2018, Mr. McGuire acknowledged in a meeting pertaining to a value-for-money audit that the City had "known about this friction issue for a while".[293] He agreed that by that time he would likely have finished reading the Tradewind report (as he summarized its contents in the context of a value-for-money audit), and was likely aware that there had been no milling or micro-surfacing carried out.[294] When asked what actions he had taken to determine whether there was a friction issue on the RHVP as of December

[289] HAM0035749_0001 (Email from Uzarowski, December 21, 2018).
[290] McGuire Transcript 3, p 13927 (lines 8-18).
[291] HAM0035769_0001 (J. Graham's notes from meeting with McGuire); McGuire Transcript 4, p 14093 (lines 6-25).
[292] McGuire Transcript 3, p 13884 (lines 2-16).
[293] McGuire Transcript 3, p 13907 (line 15) – p 13908 (line 24); RHV0001011 (Transcript from recording of meeting on December 3, 2018), p 12.
[294] McGuire Transcript 4, p 14103 (lines 2-15).

6, 2018, his response was only that he was continuing to review the 2017 Golder Pavement Evaluation and had no plans to carry out any remedial work.[295]

175. Conversations about engaging help with understanding friction values did not occur until January 30, 2019.[296] Despite working with CIMA on various RHVP-related matters in the preceding months (e.g. lighting), City representatives had not considered it necessary to ask CIMA for assistance with friction matters, interpreting friction values, or assessing the implications of the Tradewind Report (or to provide a referral to a consultant equipped to provide such assistance, in the alternative).[297] This was despite having had access to both the Tradewind Report and the Golder Report for several months at that time, both of which recommended further testing and interim measures.

176. There is simply no basis to infer that earlier disclosure of the DSM results would have prompted the City to increase its efforts to monitor the RHVP or otherwise assess the safety of the RHVP. This is particularly so given that the DSM results did not indicate any unacceptable friction levels. With the exception of the initial concern around rate of change arising from the erroneous 2010 results (addressed below), the DSM results were generally unremarkable relative to the findings and recommendations of the consultant reports, which were consistently downplayed or ignored by City personnel.

(b) The City's Treatment of MTO Information Provided Prior to 2019

177. That earlier disclosure of the DSM results would not have prompted action is also supported by a review of the City's treatment of information provided to it by the MTO prior to 2019. First, information about the initial 2010 DSM results was provided to Mr. Moore

[295] McGuire Transcript 3, p 13920 (line 1) – p 13921 (line 8).
[296] McGuire Transcript 4, p 14048 (line 22) - p 14050 (lines 15-22). As noted, Mr. Soldo then reached out to Mr. Bentley for information on February 1, 2019.
[297] McGuire Transcript 3, p 13925 (line 11) - p 13927 (line 18) and p 13956 (line 24) – p 13959 (line 10); HAM0055560 (Preliminary Reconstructed Timeline), p 8.

by Ms. Lane in or around mid-November 2010. Although the unexpected decline was ultimately a non-issue, this was not known at the time and yet did not prompt any apparent follow-up or enhanced monitoring of RHVP friction levels by the City. Given that the other DSM results were of no concern and showed a decreasing rate of decline that levelled out at some point after 2012, it follows that the remaining DSM results would not have either.

178. Second, the 2007 results were shared with the City in November 2007. The evidence provided by City witnesses was that they understood the 2007 results to be satisfactory. They also thought that FNs may increase in the coming months given the early-age low friction experienced by some SMAs (an issue that City representatives claim they became aware of only post-paving of the RHVP, but around the time the 2007 results were reviewed).[298]

179. The City did not re-test the RHVP to confirm that FN levels had in fact increased after the "early age" stage, nor did it arrange for any in-field friction testing until late 2013. If the City had any significant concerns with the 2007 results, or any apprehension given that the RHVP was the first project of its kind for the municipality (in terms of both traffic volumes and its use of SMA),[299] one would expect that it would monitor performance and arrange for testing to ensure that friction increased after the facility opened to traffic. It did not. It follows that the provision of the DSM results would not have prompted any such action either. It is of note that the average FNs measured in 2014 were only slightly lower that those generated seven years prior in 2007 (a decrease of FN2.2 for SB L1 and FN

[298] Moore Transcript 2, p 1657 (line 12) - p 1659 (line 24); Oddi Transcript 2, p 988 (line 20) – p 989 (line 15); RHVPI Transcript dated May 6, 2022, Evidence of Chris Murray (former City Manager, City of Hamilton) (**"Murray Transcript"**), p 1354 (lines 18-21).
[299] RHVPI Transcript dated May 4, 2022, Day 1 Evidence of Marco Oddi (former City of Hamilton Manager of Construction and Engineering Services) (**"Oddi Transcript 1"**), p 976 (lines 19-22).

3.3 for SB L2),[300] and that City personnel were aware that roadway friction typically decreases over time with normal wear-and-tear.[301]

180. Given the City's treatment of the 2007 results and the 2010 results, it cannot be inferred that earlier disclosure of the remaining MTO data would have prompted any changed action by City representatives.

(c) The City's Treatment of MTO's Disclosure in February 2019

181. Even after the MTO provided the City with the DSM results on February 12, 2019, there was no prompt or meaningful response by the City.[302] MTO immediately offered to provide the City with assistance by conducting friction testing on the RHVP after the winter season,[303] which City personnel understood was an activity that MTO typically resumes when winter conditions subside.[304] The evidence of City witnesses was that no steps were taken to investigate whether another form of friction testing could be carried out during the winter season.[305]

182. What the City did do after receiving the DSM results was ask CIMA to analyze MTO's data in order to construct a "degradation curve" that would confirm the MTO had collected problematic friction data that was not disclosed to the City. CIMA, which does not purport to have any particular expertise as an organization in friction analysis or testing

[300] Please refer to Part C, Chart 3, "MTO RHVP Friction Test Results – Changes in Average FNs".
[301] For instance, Marco Oddi acknowledged that asphalts generally wear over time and that he expected that friction would decrease in the normal course (Oddi Transcript 1, p 1090 (line 25) – p 1092 (line 24); Oddi Transcript 2, p 1176 (lines 7-25), and Gary Moore stated that friction reduces over time as a function of the road wearing generally (Moore Transcript 1, p 1491 (lines 17-22).
[302] HAM0028695_0001.
[303] Bentley Transcript, p 10537 (line 15) – p 10538 (line 8); HAM0028727_0001 (Note to file of Edward Soldo, February 13, 2019), p 1.
[304] Soldo Transcript 2, p 15214 (lines 2-25); McGuire Transcript 4, p 14128 (lines 14-22).
[305] Soldo Transcript 2, p 15214 (lines 15-25).

methodologies,[306] performed the assessment despite the fact that Mr. Petzold, its representative with a working knowledge in friction testing,[307] declined to do so.

183. MTO denies the legitimacy of the degradation and extrapolation exercise and disputes the accuracy of CIMA's estimated extrapolated 2019 value of FN29 (a position that is supported by actual in-field data collected by ARA in May 2019, which shows that friction levels had not decreased since 2014).[308] This was supported by Inquiry witnesses, including Mr. Malone who acknowledged that he is not an expert in pavement material.[309] Mr. Malone conceded that a number of variables would have impacted in-field friction over a 5 year period, and accepted that appropriate caution had to be used when interpreting the extrapolated result since it could be inaccurate.[310] Mr. Malone also confirmed that, even at present, he had not seen any conclusions showing that friction was a causal factor in terms of any RHVP issues.[311]

184. In any event, the (flawed) degradation results were provided to the City on February 26, 2019 and were seemingly accepted and escalated by City personnel, but still led to no immediate action in terms of testing friction or immediate remedial measures on the RHVP.[312] This was despite CIMA's recommendation to conduct in-field friction testing if the City wished to establish a trend into 2019 or confirm its extrapolation results.

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[306] RHVPI Transcript dated October 31, 2022, Day 5 Evidence of Brian Malone (CIMA Partner and Vice President of Transportation) (**"Malone Transcript 5"**), p 14903 (line 10) - p 14904 (line 20).
[307] Petzold Transcript, p 11172 (line 13) – p 11174 (line 6).
[308] Lane Transcript 2, p 2241 (line 1) – p 2242 (line 24); p 2244 (line 14) – p 2245 (line 19); p 2247 (lines 3-20); HAM0009628 and HAM0009629 (ARA Surface Pavement Investigation Report Test Results, conducted May 19-20, 2019).
[309] Malone Transcript 5, p 14957 (lines 14-19); Uzarowski Transcript 7, p 6443 (line 16) – p 6444 (line 10).
[310] Malone Transcript 5, p 14954 - 14955
[311] RHVPI Transcript dated June 1, 2022, Day 3 Evidence of Brian Malone (CIMA Partner and Vice President of Transportation) (**"Malone Transcript 3"**), p 3738 (lines 3-16).
[312] McGuire Transcript 4, p 14127 (line 13) – p 14128 (line 22).

185. The City still had not made a decision about whether in-field friction testing would be carried out after the winter months, via MTO or otherwise, and was still considering whether to accept MTO's offer to test into April 2019.[313] Although MTO took steps to move forward with the testing (e.g. in scheduling the April 2, 2019 meeting), the City ultimately did not arrange for the MTO testing.

186. Finally, in mid-May 2019 and mere days before the RHVP was re-paved, the City coordinated friction testing of the RHVP via ARA. The testing was carried out to preserve evidence (rather than because of an ongoing concern for safety).[314]

187. Given the City's lack of meaningful action upon its receipt of the MTO data in February 2019, any inference that the data would have somehow prompted a different course of action if disclosed at an earlier juncture is unsupportable.

[313] McGuire Transcript 4, p 14128 (line 14) – p 14129 (line 2); Soldo Transcript 2, p 15213 (line 22) - p 15214 (line 25): A meeting invitation with MTO is accepted on March 29 to discuss friction testing, and then cancelled a few days later; this was 9 days after request for apology.
[314] HAM0031109_0001 (Email from Mr. Hertel, May 17, 2019), p 1.

PART D – JURISDICTIONAL ISSUES

188. Extensive documentary and *viva voce* evidence was introduced throughout the Inquiry by numerous current and former Provincial employees. Their evidence pertained to wide-ranging subject matters and was introduced not only to explain the conduct of Provincial employees in respect of RHVP-specific events, but also to assist with the Commissioner's understanding of Provincial practices that might be of use in determining the municipal matters at the heart of the Inquiry, established pursuant to s. 274 of the *Municipal Act, 2001*.[315]

189. Ontario takes the position that findings regarding Provincial matters should be limited to those subjects directly related to the City (as the municipality in question in this Inquiry), and as are necessary for the Commissioner to fulfill his mandate as defined by the Terms of Reference.[316] Similarly, any findings of misconduct should be restricted to those necessary to achieve the purpose of the Inquiry, as set by the Terms of Reference.

190. Ontario acknowledges that the Terms of Reference task the Commissioner with making factual findings about the friction standards in place in Ontario during the relevant periods and whether they were publicly available.[317] However, any at-large analyses of Ontario's policies, procedures or guidelines would be beyond the scope of the Inquiry,[318] as would remedial recommendations concerning general Provincial matters (e.g. the

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[315] S.O. 2001, c. 25.
[316] *Mississauga Hydro-Electric Commission v. Mississauga (City)*, 13 OR (2d) 511; *Canada (Attorney General) v. Canada (Commissioner of the Inquiry on the Blood System)*, 1997 CarswellNat 1388 (S.C.C.); *Rigaux v. British Columbia (Commissioner of the inquiry into the adequacy of the services, policies & practices of the Ministry of Social Services)*, 1998 CarswellBC 29 (B.C. S.C.); additional reasons at (1998), 1998 CarswellBC 2239 (B.C. S.C.); additional reasons at, 1999 CarswellBC 573 (B.C. S.C.).
[317] Terms of Reference, paras 2(xxii) and (xxiii).
[318] Similarly, a provincial inquiry could not authorize a review of the substantive operations of a federal institution or federal administrative matters, other than as they pertain to provincial issues and as are defined by the terms of reference: *Canada (Attorney General) v. Saskatchewan (Commissioner of Milgaard Inquiry)*, 2006 CarswellSask 504 (Sask QB).

implementation of a Province-wide FN threshold).[319] Indeed, evidence has not been introduced about how Ontario's policies, practices and guidelines apply Province-wide or how and why they may be appropriate given the varied make-up of the Province.[320]

191. Finally, Ontario notes that paragraphs 2(xvi) to 2(xx) of the Terms of Reference set out the various questions to be answered about the MTO Report (the "2007 Results") (e.g. did it provide "support or rebuttal" to the Tradewind Report, how was it distributed, why was it not made publicly available, would it have triggered safety changes, etc.). On the other hand, there is one question that must be answered in respect of the DSM Results, which is "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?" (paragraph 2(xxi)). Ontario wishes to reinforce this distinction, given that Inquiry findings and recommendations are to answer the questions as set out in the Terms of Reference.

[319] *Quebec (Attorney General) v. Canada (Attorney General)*, 1978 CarswellQue 40 (SCC).
[320] This is in contrast to, for instance, a recommendation that non-binding Provincial policies be applied or amended by the City in a certain manner given municipal considerations.

CONCLUSION

192. The Province submits that the evidence introduced throughout the course of the Inquiry supports a conclusion that MTO personnel at all times acted reasonably and that their conduct did not negatively impact City interests or the safety of the motorists travelling on the RHVP. In particular, the Province submits that the evidence supports the following findings:

(a) The MTO did not know (and could not reasonably have known) that the City had any ongoing concerns about the Demix aggregate or any specific concerns pertaining to friction on the RHVP;

(b) On one occasion, the MTO was aware that the City was interested in certain data, as it was collected at the request of the City (e.g. the 2007 results); the data was circulated promptly and appropriately, and given the lack of follow-up from the City or its representatives, MTO personnel reasonably concluded that all underlying questions had been resolved;

(c) The 2007 results and all DSM results were objectively satisfactory for the years in question, were not concerning in nature, and showed that the Demix aggregate was of good quality;

(d) The 2007 results and all DSM results were viewed as satisfactory by MTO personnel and did not prompt them to form any material concerns about the Demix aggregate or the safety of the RHVP (with the exception of the erroneous 2010 results);

(e) With the erroneous 2010 results, the MTO suspected that the City might be interested in information on the matter and followed up with the City accordingly; given the lack of follow-up from the City and MTO's subsequent discovery that the 2010 friction

decline was a non-issue, MTO personnel reasonably concluded that the City had no ongoing questions or concerns about the matter;

(f) Given the satisfactory nature of the DSM results, MTO was justified in following standard DSM list distribution procedures in terms of distributing them only internally to the S&A section for aggregate assessment purposes (particularly absent any requests for the data from any external entities);

(g) The disclosure of the MTO friction data prior to 2019 (to the extent that it was not yet disclosed) would not have changed how the City monitored friction on the RHVP. MTO's data was not concerning in nature, and even when the City had faced identified concerns, it did not institute any enhanced monitoring; and,

(h) If RHVP had been a Provincial highway, the MTO would not have conducted itself any differently and would not have placed it on a monitoring program that involved site specific analysis of non-friction factors.

193. Ontario appreciates the opportunity to participate in this Inquiry and understands that ensuring public confidence in the safety and reliability of the road networks within Ontario is essential. Ontario looks forward to receiving the Commissioner's findings on the matters canvassed during this Inquiry, particularly those engaging Provincial interests.

March 13, 2023

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