RED HILL VALLEY PARKWAY INQUIRY

TRANSCRIPT OF PROCEEDINGS
HEARD BEFORE THE HONOURABLE J. WILTON-SIEGEL
held via Arbitration Place Virtual
on Thursday, March 23, 2023 at 9:30 a.m.

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Arbitration Place Virtual

--- Upon resuming on Thursday, March 23, 2023 at 9:30 a.m.

MR. LEWIS: Good morning, Commissioner, Counsel. We're here on our last day of the hearings and for the closing submissions first of counsel for Golder and then counsel for the MTO. So I believe Ms. Roberts is leading off for Golder.

JUSTICE WILTON-SIEGEL: Okay. Ms. Roberts, please proceed.

CLOSING SUBMISSIONS BY MS. JENNIFER ROBERTS:

MS. JENNIFER ROBERTS: Thank you, Mr. Lewis, Commissioner.

At the outset I just want to reflect on the origins of the inquiry, and that is how could it be that the City had a report about friction on the Red Hill in circumstances in which there were questions about whether it was slippery and no one apart from Mr. Moore had the report and nothing was done with the information or the recommendations. And these questions are asked in a circumstance where people have been injured and killed on the Red Hill and I want to acknowledge that as the background because I think it's

important not to lose sight of.

As I said when I made submissions in support of Golder's application for standing in January of 2020, Golder is committed to transparency and we have endeavoured throughout to assist with exactly that.

I want to address a point of clarification following listening to the City's submissions and reading -- and reading their written submissions.

Golder was retained by the City as its pavement consultant. They were not the safety consultant. And as we know, the City retained its own safety consultant, CIMA, in 2013, and CIMA had access to the City's data about collisions and most -- and I'll come back to most -- of the information by which they might need to have evaluated safety on the Red Hill.

By my count the City's submissions state more than 20 times that Golder did not express that there was a safety concern on the Red Hill, and that's true, but sort of misses the point; they are not the safety consultant. Dr. Uzarowski's evidence was that friction values in the Tradewind report were not a red flag to

him. Indeed, none of the experts who have evaluated friction on the Red Hill have considered that friction by itself was a safety hazard. The City's own experts consider that friction on the Red Hill was acceptable. Indeed, Mr. Hein, who has reviewed all of the friction testing and acknowledged that CIMA's findings about the high incidence of wet weather collisions, continues to maintain that friction values on the Red Hill are acceptable.

I'm going to go back to some background facts. The detailed design of the Red Hill was divided amongst three engineering firms, Stantec, Philips and McCormick Rankin. Most of the focus of -- in reference to collisions on the Red Hill has been in relation to section B, which is the section that Philips designed. The civil engineers were responsible for the civil design and the alignment.

Let me note that from the outset Golder has pressed for the inclusion of geometric data in the evidence, particularly in the overview document. We asked and asked again for drawings for the Red Hill which Dufferin was able to locate and the City eventually found.

In Golder's view it was not -- not possible to assess what factors contributed to collisions on the Red Hill without a thoughtful and thorough analysis of geometry, and as we've heard from the safety experts and Mr. Brownlee as well as CIMA, the geometry on the road with its elevation change curvilinear alignment is highly relevant to the question of what factors contribute to collisions on the Red Hill.

Golder's evidence, not surprisingly, is mostly going to be focused on the pavement and there has been a great deal of evidence in relation to the design of the pavement on the Red Hill and its construction. It's not contested, but I will highlight some of it because I think it's important to shine a light on the question of whether there was anything done in 2007 or any deficiency in any of the material or construction that would have caused the Red Hill to be slippery. In particular, because of the importance of aggregate in providing good frictional characteristics in a pavement, was there anything about the aggregate that was supplied that would have rendered it susceptible to undue polishing.

The design of the Red Hill goes -- the pavement goes back to 2005. Golder was retained to prepare a feasibility study about the use of the perpetual pavement, and that assessed the pros and cons of using a perpetual pavement in contrast to a conventional deep strength one. And nothing turns on it, but the notion of the perpetual pavement was that the pavement would provide greater longevity. From the outset of Golder's engagement the City intended to use stone mastic asphalt as the surface course.

And let me be clear on this point, because it seems it's been a point of -- may potentially be misunderstood in the reporting. There is nothing experimental about the use of SMA. It was not controversial in 2007 when it was chosen as a surface course, and it is a premium pavement surface and used in fact on the majority of MTO's series 400 highways.

The perpetual pavement design was an updated pavement design which Golder updated in its perpetual pavement design study Phase 2, which is a 2006 engagement.

The pavement design

specifications and special provisions recommended in Golder's design study were incorporated in the tender for the pavement construction in early 2007 and the main line paving contract was awarded to Dufferin as we've heard. Philips Engineering was the City's prime consultant retained to administer the project and Golder was retained by Philips to provide quality assurance for materials as well as construction.

As contractor, Dufferin had the primary obligation to provide quality control and it had its own consultant assisting with QC testing.

We've heard a lot about the aggregate and I'm going to go to that.

Dufferin proposed to use aggregate from its Demix-Varennes quarry for the Superpave 12.5 FC2 as well as the SMA mixes for the project. At the time this quarry was not on the designated source materials list. It was first listed in 2009. As we have heard, it was not a mandatory requirement of OPSS for the aggregates to be on the DSM list. And the Varennes aggregate had a history with the Ministry of Transportation in Quebec but not with MTO, and

Dufferin provided information from the MTQ and provided physical test data in order that its -- that the asphalt could be qualified. And the outcome of the fact that the aggregate was not on the DSM list was that instead of relying on MTO's work, Dr. Uzarowski of Golder had to qualify the aggregate, and he did.

I am conscious that we have gone through this a number of times and it is in -- it is in detail in the materials. There are a couple of points here that Dr. Uzarowski considered that the physical properties of the aggregates were excellent. It's a finding with which Mr. Chris Rogers of the MTO who qualified the aggregates in 2008 for the DSM list agreed. Dufferin provided test results to establish the different elements of the aggregate, including its resistance to polishing. They delivered the test -- results from the test use by the MTQ which is the coefficient of polishing by projection, and that exceeded the value required in Quebec. And subsequent testing by the MTO in 2008 using the polished stone value testing, PSV, which is the testing preferred by the MTO, resulted in a value of 52, which is greater than what is required for

their DSM list.

The testing data provided by Dufferin as well as the MTO testing was reviewed by our expert Dr. Assan Baaj who confirmed that the physical properties of the aggregates in terms of their abrasion, attrition resistance, soundness, freeze/thaw resistance were all excellent.

Dr. Baaj confirmed that the aggregate was suitable for surface course asphalt mixes used for high volume high speed highways in Ontario. Dr. Gerard Flintsch in his testimony agreed with Dr. Baaj, as did Mr. Hein, the City's expert.

Having verified that the laboratory test results established that the aggregate was -- had excellent physical characteristics, Dr. Uzarowski sought to confirm the field performance. His evidence was that the field performance was the missing element in the picture, so he contacted the MTQ on July 18, 2007, and his notes record the conversation that he was told that the aggregate was a very good one, used by the MTQ, one of the best used in high volume roads. The aggregate was accepted and Dufferin

began to pave the main line with SMA on August 1, 2007.

There is evidence in relation to the construction. And all I'm going to say about it really is that same detailed QC/QA review that went into the qualification of the aggregate was also applied to the construction. And in his review, Dr. Flintsch found that the mix designs were consistent with current mix practices, and although there were a couple of departures from the mixes on values, none of them would have been expected to have significant negative impact on the frictional properties. And there is also some incidental low compaction in some sections in early August. That was -- the evidence is that that was essentially resolved but that exists. Again, that not have been relevant to an evaluation of friction.

The paving was completed in 2007 and the road was opened to the public in the fall of 2007. In 2013 there were some evidence that the Red Hill was showing wear. In particular, there were some findings of low severity cracking. There were two significant flooding events that affected the Red Hill, one in

2009 and one in 2010, and the evidence is is that that likely contributed to the deterioration of the pavement, as well as the fact that the road had a much higher volume of traffic than it was anticipated at design.

What became the Golder report began in early 2013 as a five-year condition evaluation. Although not known to Golder at the time, CIMA had also engaged -- sorry, the City had also engaged CIMA to conduct a safety review of a section of the Red Hill which culminated in their report, the Red Hill Valley Parkway safety review that we call the 2013 CIMA report.

In September of 2013 it seems following an incidence of high rainfall Mr. Moore, the director of engineering, e-mailed Dr. Uzarowski identifying that the police had been attributing accidents to the slipperiness of the pavement and asked for skid resistance, which was added to the existing engagement.

In September of 2013 CIMA delivers its report and identified the atypical high proportion of single motor vehicle collisions on wet road surface in non-daylight collisions on their segment. That information is not provided

to Golder.

In carrying out the friction evaluation Golder first reaches out to MTO. They are unable to do the friction testing and declined at the end of October. Golder retained Tradewind Scientific to perform friction testing and Dr. Uzarowski's evidence was that he considered Tradewind to be experts in pavement friction testing.

The City's submissions might lead one to think that grip tester, which was the device used by Tradewind, is not used in Ontario. That's not true. It is used on roads, one of the devices used by the 407, and the MTO seems to have considered it but decided to continue using its locked wheel because of its accumulated data. It has advantages -- the grip tester has advantages in terms of continuous testing, and the way it operates is described as better, mimicking the affect of antilock brakes.

Dr. Uzarowski testified that the grip tester is well established. It's described in the TAC guide and in a number of technical presentations.

We note that Hamilton had no

difficulty in finding someone to use a grip tester in the spring of 2019 when it retained Englobe, who was able to test the Red Hill using its grip tester.

As we know, Tradewind performed friction testing on the Red Hill on November 20, 2013. On January 2014 Dr. Uzarowski obtained, likely from a telephone call, a summary of the friction testing from Tradewind, and he sent that summary along with the testing results from 2007 testing of the Red Hill conducted by MTO, along with a paper, a CTAA paper entitled "Early Low Age Friction Problem of SMA in Ontario."

Dr. Uzarowski sent this information to Mr. Moore and he understood it to have been required because of a meeting with management. In fact, it was sent to Tom Dziediejko who was general manager of AME Aecon Materials, and Tom Dziediejko was on the SMA task force committee looking at early age low friction with SMA.

Golder received the Tradewind report on January 26, 2014 and, as we know, Tradewind found that friction on the Red Hill

nearly in all areas have friction values below or well below the relevant UK investigatory level 2 hat it referenced.

Dr. Uzarowski's evidence is that he reviewed the reference guide identified by Tradewind and found Tradewind's use of the relevant UK investigatory level as overly conservative. And much has been made about the application of the UK investigatory level as a foreign standard.

Dr. Uzarowski's analysis of the Tradewind friction relied on the 1997 Transportation Association of Canada Pavement Design and Management Guide, which set out a table with reference to standards using a UK standard for investigatory levels with a SCRIM. Dr. Uzarowski then identified a correlation for SCRIM skid numbers, correlating to grip tester numbers, and that was published by the UK Pavement Management System. And that chart in the UK PMS is -- correlating the investigatory levels for SCRIM to grip tester, was relied on by CIMA in the memorandum of February 4, 2019, in which they noted that the table was also referenced in the United States in their guide to pavement friction

and cited by Dr. Flintsch in his PowerPoint presentation, the primer, and the analysis of friction on the Red Hill, which is his November 2022 report.

Dr. Uzarowski considered that the applicable guide was GN of 41 which he rounded to 40. He concluded that the friction numbers from the grip tester were relatively low, a finding with which Dr. Flintsch agrees.

Dr. Uzarowski's view that the Tradewind reference for investigatory levels was overly conservative was also subsequently confirmed by Tradewind itself, CIMA in its memorandum of February 4, and Dr. Flintsch.

Dr. Uzarowski e-mailed Mr. Moore on January 31, 2014 enclosing the Golder report. The appendices to the report included the field investigations and the Tradewind report, and Dr. Uzarowski noted in his covering e-mail that the friction results had been included, and if you have any questions or require more information please do not hesitate to contact me.

Section 5 of the Golder report summarized the friction testing results including a synopsis of the Tradewind report and Golder's

analysis, and again, Dr. Uzarowski's finding that considered that friction levels were relatively low.

The appended Tradewind report also discussed friction testing on certain ramps. And I note it because we know that there have been issues with ramps also being considered slippery; for instance, ramp 6 that comes up early in the CIMA investigation. The ramps were paved with the same aggregate but a different mix design. That was FC2. And the average for the ramps was very high, high 50s, low 60s. And I think that that's important to note because it goes to the issue that we've all been struggling with, is to what extent is friction, you know, a contributing cause to collisions.

Section 6 of the Golder report included its analysis and recommendations. And I'm going to come back to this a couple of times because the recommendations incorporate the recommendations to remediate the pavement which has deteriorated as well as address the relatively low friction.

And the Golder report recommends that to remedy the longitudinal top

down cracking, it is recommended that the surface course SMA be milled and a new surface course be placed at selected locations. At minimum, milling and overlay should be carried out on sections where the most frequent top down cracking is observed, and the Golder report estimates that it's about 2.5 kilometres. The report says the exact locations for the milling and paving should be determined on site.

On the remaining portion of the Red Hill the existing cracks in the surface course should be routed and sealed to prevent the ingress of water, and following the routing and sealing it is recommended that a single layer of microsurfacing be applied. In carrying out the mill and overlay where required and applying the microsurfacing the issue of the relatively low FN would also be addressed.

Dr. Uzarowski's evidence is that it was his practice to send a draft report to a client for discussion and feedback, and he explained the report is finalized once the client had provided comments. And that's, as we've seen from other consultants providing evidence in the inquiry, Golder's practice of delivering a report

in draft for comments is consistent with that of other consulting engineers, and Mr. Moore echoed that this norm is typical industry.

Mr. Moore and Dr. Uzarowski met at the City on February 7. Dr. Uzarowski handed a bound copy of the Golder report to Mr. Moore, including the Tradewind report. Mr. Moore recalled that they met but had no specific recollection of what was said.

Dr. Uzarowski presented his analysis and findings from the Golder report to Mr. Moore. Dr. Uzarowski took notes of his discussion with Mr. Moore and indeed, Dr. Uzarowski's notes are a chronicle of all of his work. In any engagement with the City he kept notes of what was said and often notes in advance of preparing for meetings.

Mr. Moore's evidence was that he read the Golder report before the meeting, and Dr. Uzarowski testified he discussed the Tradewind friction findings and that Mr. Moore asked no questions about the results or standards for the investigatory level by which to assess the friction data.

Dr. Uzarowski thought that

Mr. Moore understood the findings and recommendations. Dr. Uzarowski's evidence was that he also, when he met with Mr. Moore, delivered brochures from the le (ph) paving about microsurfacing as additional information in support of the recommendation and that brochures address microsurfacing as an effective pavement preservation technique for high speed, high volume roads.

And at this point in 2014 Mr. Moore had also received all three pavement and material technology review reports. They also included findings and recommendations about microsurfacing as an effective technique for pavement preservation.

Although Mr. Moore's testimony in this inquiry was to the effect that he did not understand or agree with the reference standard for friction referred to by Tradewind and considered that it made no sense that friction improved from 2007 but was relatively low, there's no note recording a question or statement by Mr. Moore about friction or the standard by which to assess it. There's no evidence -- corroborating evidence to support Mr. Moore's

assertions that he sought clarification on the UK standards when he first received the Golder report or when Dr. Uzarowski presented the findings and recommendations to him in early 2014.

Mr. Moore's evidence was he did not have a problem with Golder's recommendation to mill and pave in the areas where there was the worst cracking, but didn't agree with the recommendation to use microsurfacing. He stated that that was not something that we had successful experience with on other roads.

So while he did not recall specifically a discussion, he said that at some point he would have made it clear that microsurfacing was not something that we would consider useful and good value for money.

Dr. Uzarowski's evidence is that he also recommended shot blasting in the February 7 meeting as a cost effective alternative to improve frictional characteristics of the pavement. Mr. Moore had no recollection of the recommendation.

Both Dr. Uzarowski as well as Dr. Vimy Henderson, who was project manager for Golder for the Golder report, testified that the

findings analysis and recommendations contained in the Golder report were complete. It was effectively final subject to the courtesy of inviting comments from the client before sending a signed report, and in fact, Mr. Moore, his evidence was that he acknowledged that testing and the data from the course, the falling weight deflectometer and the inertial profile testing were all final.

There was some evidence later in the chronology, you know, as we get to 2018, some suggestion amongst the City witnesses that the Golder report wasn't final and that somehow explained why it hadn't been internally reported.

Dr. Uzarowski's evidence was that Mr. Moore was always more interested in the results of investigations and he wasn't finalizing a report. In fact, he said he didn't care about finalizing, he just wanted the information, he wanted the results and move ahead; that was his attitude. And for me it was the analysis were final, recommendations were final, and there was no request. I asked him if there were comments and he didn't have any request.

So at least in this respect

Mr. Moore's evidence agrees with Dr. Uzarowski's. Mr. Moore explained that he was looking for content and for action that they needed to take. Making it pretty and putting it on a bookcase was something that usually followed as a matter of course but not something that he would chase for, and absent a request from the City to finalize the report it remained unsigned.

The evidence from Mr. Moore is that he did not send a copy of the Golder report and Tradewind report to anyone in the City after receiving it, and apart from the evidence that we'll come to in August in which Golder -- August of 2018 Golder resends the Tradewind report to Mr. Becke. We have no evidence that anyone other than Mr. Moore received the Golder report.

JUSTICE WILTON-SIEGEL: We're talking about in the City?

MS. JENNIFER ROBERTS: Yes.

JUSTICE WILTON-SIEGEL: So you are setting aside the Shillingtons -- the delivery to Shillingtons.

MS. JENNIFER ROBERTS: That's something that Golder doesn't know about. All we know is it's given to Mr. Moore in the reporting.

There are some engagements in 2010, 2012 in relation to the pavement and materials technology review. I've identified them in our written submissions and I'm not going to -- I'm not going to describe them here. It's not directly relevant.

The next engagement note in relation to the Red Hill is the investigation and reporting for the inertial profile testing on the Red Hill, and that is what's described sort of colloquially as the bumps and dips. Inertial profile testing was done in 2013 as part of the Golder report and it was done again in 2016. The engagement to provide the inertial profile testing comes on the heels of the City's extensive investigation into the Red Hill Valley Parkway collisions that's conducted by CIMA. Golder had no knowledge of the CIMA investigation. The questions asked by CIMA as part of their investigation seemed to ripple into questions asked of Dr. Uzarowski in Golder's engagement.

In the course of CIMA's investigation, Mr. Malone contacted Mr. Moore about the asphalt surface of the Red Hill, and on August 7 -- sorry, on August 7, 2015 Mr. Moore

provided a summary of the friction testing data, and again this is a compiled re-sent e-mail, sort of a recompilation of Dr. Uzarowski's e-mail of January 24, 2014, which includes the MTO 2007 friction testing, a summary of the Tradewind testing, and that article on the early age friction.

When providing it Mr. Moore admonishes that the information is not for republication. That's consistent with the theme that we suggest is throughout Mr. Moore's evidence, that friction data is not something that should be shared as it might be used in claims against the City.

Although Mr. Moore had the Tradewind report, including their opinion that friction was below or well below the UK investigatory level and had the Golder report that included Dr. Uzarowski's findings that friction on the Red Hill was relatively low, Mr. Moore chose not to send either to CIMA, referring the CIMA -- preferring the summary data which contained no assessment of the friction data.

And we've got back and forth in August of 2015 between Mr. Malone and

Mr. Moore, and Mr. Malone asked two questions. He asks if his assumption that the FN numbers of less than 30 are below the desired level is correct, and if the 2007 and 2013 tests use the same methodology or were comparable.

Mr. Malone's evidence was that Mr. Moore did not advise him that the Golder/Tradewind performed the testing in the Red Hill Valley Parkway in 2013, but instead told him that the testing was done by MTO both times and that the data was comparable.

In the chronology sequence we have a couple of things that happen in the fall of 2015. One is that in its review of the 2015 CIMA report Mr. Moore sought to delete this entire section recommending that the City conduct friction testing and he commented there was 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.

And on December 7 Mr. Moore attended the public works committee meeting where the content of the 2015 CIMA report was presented to council. At the meeting Mr. Moore responded to

the question about the quality of the asphalt used in the Red Hill and informed the public works committee that the MTO had performed initial friction testing and received results at or above what the MTO typically expected from high grade friction mixes. And he went on to say that they performed subsequent testing five years after in approximately 2012, 2013 and found that the road was holding up exceptionally well. He added "we have no concerns about the surface mix."

In his description Mr. Moore contradicted Dr. Uzarowski's finding that friction on the Red Hill was relatively low and Golder's recommendation that the Red Hill was in need of rehabilitation and preservation treatment.

On December 17 Mr. Moore sent to Dr. Uzarowski the same recompiled January 24 summary of friction testing, and Dr. Uzarowski's evidence is that he had a telephone call with Mr. Moore during which Mr. Moore requested a copy of the Tradewind report. His evidence was also that at this call Mr. Moore asked follow-up questions about the Tradewind report, such as standards or anticipated values and correlation between testing methods used in 2007 and 2013.

And what I note here is that the questions that Mr. Moore -- or that Dr. Uzarowski explains were asked of him echo the questions that Mr. Moore had asked -- sorry, Mr. Malone asked Mr. Moore on August 7, 2015 when he first received the 2007 and 2013 friction result.

Dr. Uzarowski's evidence is that this is the first time since the delivery of the Golder report and the appended Tradewind report that Mr. Moore made an inquiry about the findings in the Tradewind report.

And in response to Mr. Moore's request, Dr. Uzarowski sent a copy of the Tradewind report to Mr. Moore, noting that he would look at some standards and anticipated values.

Dr. Uzarowski promptly contacted Mr. Taylor, Len Taylor of Tradewind, and asked the following questions: Do you know if there's any correlation between JTN and FN. The JTN limits you gave in the report are from the UK. Do you know what limits are typically used in the US or in Canada.

In response Mr. Taylor sent a

white paper comparing the grip tester and locked wheel methods. Dr. Uzarowski's evidence was that he was familiar with the paper and it was academically good but not particularly useful because the correlation was made in consistent controlled conditions.

There's evidence that Dr. Uzarowski made a further inquiry, asking if there were any values in Canada or the US for a grip tester, and Mr. Taylor responded that he was not aware of any official values, and that in fact is consistent with the statement at the beginning of the Tradewind report.

Dr. Uzarowski's evidence was that the content of his communication with Mr. Taylor was reported to Mr. Moore on March 4, 2016, when he presented the results of the profile testing. His evidence was that there wasn't a good, direct, clear correlation between friction data taken using a locked wheel and a grip tester and that there were no official values used in Canada or the US for grip tester.

Mr. Moore has testified that he did not receive a response to his query and I submit to you it is absolutely not possible that

Dr. Uzarowski was asked a question, did the research for it, and didn't report back. He did.

December 17, 2015 is the initial -- the initiation of the inertial profile testing engagement, and we know in 2016 that the Red Hill was programmed for rehabilitation. And Mr. Moore --

JUSTICE WILTON-SIEGEL: Can I just stop you for a second, Ms. Roberts. I just want to go back to the meeting or the telephone call in December. I meant to check this and have not had an opportunity to do so.

Do you know if there are any minutes of that or notes of that call?

MS. JENNIFER ROBERTS: There is certainly -- when Dr. Uzarowski sends the Tradewind report he references the discussion, but you ask a good question, and if you give me a minute I will double check.

I think that that's reported in the exchanges. I will double check here, but I don't think there is a specific note on December 17.

JUSTICE WILTON-SIEGEL: That was my recollection but I thought I should check

because it is potentially relevant who raised the Tradewind report in that first -- in that meeting, whether it was Mr. Moore or Dr. Uzarowski.

MS. JENNIFER ROBERTS: Well, the sequence is is that Mr. Moore e-mailed that compiled -- that compiled e-mail back to Dr. Uzarowski.

JUSTICE WILTON-SIEGEL: And that would have a reference at the bottom, as I recall, for the paper to the Tradewind report.

MS. JENNIFER ROBERTS: Yes, it does.

JUSTICE WILTON-SIEGEL: But he doesn't ask anything at that stage about standards relating to the Tradewind report.

MS. JENNIFER ROBERTS: No, he doesn't. Not in the e-mail.

JUSTICE WILTON-SIEGEL: Dr. Uzarowski says it came up in the meeting or in the telephone call, but it's not clear whether it came at Mr. Moore's insistence or it came -- sort of developed out of the conversation with Mr. Moore, or perhaps for the first time that the Tradewind report used different standards.

MS. JENNIFER ROBERTS: Right.

So I just need to correct myself. There is a reference to a notebook, discussion with GM. This is on December 2017.

JUSTICE WILTON-SIEGEL: And the document reference is?

MS. JENNIFER ROBERTS: I've got it as Golder 7409 at image 13.

JUSTICE WILTON-SIEGEL: Are you looking at your submission right now?

MS. JENNIFER ROBERTS: No, I'm looking at a note I have. I didn't specifically reference in my submissions the notes. You've asked and I've gone back to look, but there it is. It doesn't -- at least by my read the notes don't tell you who raises Tradewind -- question about the Tradewind report.

What we interpret from the -- we interpret from Dr. Uzarowski's responding e-mail in which he attaches the Tradewind report that the question is asked about the correlation and -- correlation and if -- what the standards mean.

JUSTICE WILTON-SIEGEL: Okay.

MR. LEWIS: I can pull up the note if the commissioner wants to see it.

JUSTICE WILTON-SIEGEL: That's fine. We can look at it during the break. If I've got any further question I'll get back to you.

MS. JENNIFER ROBERTS: I just want to go to a slightly different -- this is the issue of Red Hill being reprogrammed -- a program for rehabilitation.

Mr. Moore in his testimony noted that it had been programmed by asset management for resurfacing and he suggested that asset management likely had the Golder report because of its decision making since there was information in the Golder report that would have supported the decision to resurface. But as you noted yesterday, Commissioner, Mr. Andoga denies that he ever received the Golder report.

What I do want to say is that the Golder report, in the analysis and recommendations, references anticipated necessary maintenance as part of the pavement lifecycle in the form of milling and paving, routing and sealing, and Mr. Moore speculated that they had likely had some discussion on timing about the recommendations because we had gotten 14 years of

traffic in six. In other words, at this point -- clearly the analysis done by Golder that the pavement was deteriorating in large part because of the significant volume of traffic in excess of what had been expected was being on boarded by the City in its assessment as to what rehabilitation was necessary.

Another piece of information, and I think it's important so I'm going to note it, and that is in the Golder report in the part that is about milling and paving. The recommendations say the exact locations for milling and overlaying should be determined on site. And I think that that's significant because what happens in the inertial profile engagement is that Mr. Moore -- Dr. Uzarowski's evidence was that Mr. Moore wanted the exact locations of the bumps and dips plotted on a map for the project. The results of the inertial profile testing were sent and presented to Mr. Moore at a meeting on March 4 in the form of an Excel spreadsheet and a plan of the Red Hill on which Dr. Uzarowski had plotted the bumps and dips. There was no formal report for this engagement and Mr. Moore did not request one.

Dr. Uzarowski recorded the topics discussed with Mr. Moore in his notes of the meeting of March 4. At this meeting his evidence is that he advised Mr. Moore of the locations on the bumps and dips and repeated his recommendation to use microsurfacing to address the pavement deficiencies, and that recommendation from microsurfacing was repeated from the Golder report and consistent with the advice on pavement preservation techniques presented in the PMTR report.

Dr. Uzarowski's evidence is that he also provided the plans and plotted location of the bumps and dips to be repaired to Mr. Andoga, and as we know, Mr. Andoga arranged for Miller Paving to conduct a lunch seminar with the City on March 21, 2016, and the topics for that seminar included asset management basics including microsurfacing.

Mr. Nicholas Cifelli, technical services manager for Miller Paving, wrote to Mr. Andoga by e-mail exchange of May 2, 2016, and he stated he drove the LINC and Red Hill and commented that micro was a good option, however we need to allow for some preconstruction

repairs and perhaps some crack sealing the year after in case some cracks return.

Although it's not acknowledged, the rehabilitation strategy of repairing the bumps and dips, crack sealing, and then using microsurfacing in fact follows the recommendations in the Golder report.

So what this suggests to me is that although a report is not circulated, information from it certainly seems to be known within asset management.

JUSTICE WILTON-SIEGEL: Why do you say that? This seems to be Mr. -- I've forgotten -- his independent assessment.

MS. JENNIFER ROBERTS: Mr. Cifelli's independent assessment?

JUSTICE WILTON-SIEGEL: Yes.

MS. JENNIFER ROBERTS: Yes. So he's coming to the same conclusion, I would agree. And Mr. Andoga is -- you know, it may be completely in parallel but they seem to know a couple of things about the Red Hill, that it needs to be rehabilitated.

JUSTICE WILTON-SIEGEL: Yes.

MS. JENNIFER ROBERTS: And

they also know, and it comes out in Mr. Becke's evidence that this top down cracking, the only way you know that the cracking is top down is because of the cores taken as part of the 2014 Golder report.

JUSTICE WILTON-SIEGEL: Okay.

MS. JENNIFER ROBERTS: In any event, although the decision-making process is a little opaque, but it appears that the rehabilitation and preservation techniques discussed by Golder and Miller Paving were not pursued, and in early 2017, if not earlier, the City seems to have decided to repave the Red Hill.

In the same meeting of March 4 there is sort of third -- another sequence of exchanges that result from it, and that is that at that meeting Dr. Uzarowski's evidence is Mr. Moore again referred to statements from the police talking about slipperiness of the Red Hill. Dr. Uzarowski's evidence was that as a consequence he also recommended blasting, meaning shot blasting.

So I just want to note that Dr. Uzarowski has no knowledge of collisions on the Red Hill except for what anecdotal information

he's receiving from his client. He's the pavement expert. So what he does here and what he does consistently throughout is provide advice as to what to do, how to improve frictional characteristics of the asphalt.

And indeed what he does immediately following this meeting, and we can track it in the correspondence, is that Dr. Uzarowski contacted a number of companies offering shot blasting surfaces, Blastrac, Dimetic was one of the first companies contacted. He also contacts a skid abrader and in fact gets a quote for 300-some thousand dollars to skid abrade the entire surface.

There's some exchange of e-mails March 15, and it suggests that at least at outset Mr. Moore initially thought that the quote that Dr. Uzarowski relayed was for further friction testing instead of the surface treatment.

By further e-mail exchange Dr. Uzarowski clarified the benefits of skid abrading and shot blasting while recommending further friction testing to find the worst locations for selective treatment. In other words, if that's too much money then test --

further friction testing, find a location that may warrant selective treatment.

Mr. Moore responded I have never heard of this technology or what it does. Besides, it doesn't address the cracking, the need to address the surface distresses and deformations humps and bumps so I don't think we're interested.

So in 2017 the evidence is that there's a further engagement that becomes what we describe as the 2017 pavement evaluation report, and this is in the context of City works reporting that repaving had been scheduled for 2018 to 2019. And what happens is in November of 2017 Mr. Moore becomes interested in whether it's possible to use a treatment called hot in-place recycling to repave the Red Hill. A hot in-place recycling is a process by which the existing surface pavement is scooped, placed in a mixing mill and then asphalt rejuvenator added and some beneficiating mix to correct the mix characteristics, and then the HIR mix is used to repave using conventional pavers and compacted rollers.

And the point here is that if it were applicable it would provide advantages to

the City in terms of cost efficiency and also environmental benefits. However, if the character of the mix has to be changed say from gap graded to dense graded, then the amount of new beneficiating mix had to be significantly increased and customized to make the final project meet product specification, and indeed that was the complication of trying to turn SMA and use it for an HIR process.

The 2017 pavement evaluation proposal provided for three tests, investigation of surface frictional properties using the British pendulum tester, pavement macrotexture using a sand patch method, and coring of asphalt surface layers, extracting of aggregating and testing for PSV. Of the three tests, only PSV was necessary to an assessment of whether the HIR was appropriate for the Red Hill and Dr. Uzarowski explained he understood that the evaluation for skid resistance was just for information.

All three tests required that lanes of the Red Hill be closed for traffic. Testing was conducted over two nights on December 6 and 7, 2017. Dr. Uzarowski's evidence was that the weather had been mild in the previous

days but unfortunately fell to freezing on those evenings. And on -- during the testing field notes taken by Emilia Josen of Golder recorded that they witnessed three collisions that occurred during the testing.

Dr. Uzarowski's evidence was that he first learned of fatalities on the Red Hill when Mr. Dave Hein, principal of ARA at the time and now City's expert, e-mailed a link to the Hamilton Spectator article titled "Scratching the Surface For Answers on Red Hill Paving." The article also repeated anecdotal concern expressed by drivers that the Red Hill was slippery.

There are three occasions in 2018 where Dr. Uzarowski testified he repeated his recommendation made to Mr. Moore in 2016 to use shot blasting to improve the frictional characteristics for the Red Hill. Those are on February 23, March 9 and May 14. Of all of the Hamilton staff that attended those meetings, only Mr. Oddi acknowledged that Dr. Uzarowski recommended a technique to improve the frictional characteristics, or that the proposal was rejected.

He remembers the reason why

it was rejected differently. Mr. Oddi explained in his testimony that he didn't think that microsurfacing, or any interim treatment, made sense in advance of either HIR or resurfacing and therefore it seemed like a waste of taxpayer dollars.

The meeting to discuss the rehabilitation strategy for the Red Hill was scheduled for March 9, and this the meeting at which Dr. Uzarowski's evidence is that he presented the findings from the 2017 pavement evaluation.

In preparation for the meeting Dr. Uzarowski took -- created detailed notes, and he did so because he understood that Mr. Moore was keen on doing HIR of the surface and he had to deliver the likely unwelcome opinion that it might not be technically feasible.

Dr. Uzarowski brought a hardcopy of the results from the 2017 pavement evaluation and that it took -- that was a hardcopy of the PSV testing, and he took a detailed record of the results from the British pendulum testing. There's a great deal of divergence in what people recall of that meeting. Of the attendees,

Dr. Uzarowski and Mr. Mike Becke took contemporaneous notes. Dr. Uzarowski also memorialized his recollection in an internal memorandum written on March 14, and the preparation notes that he prepared set out the options for the Red Hill of using a mill and overlay or HIR.

Dr. Uzarowski's evidence of his presentation on what was said is as follows: The measured texture of the surface tested using the sand patch showed that the macro texture was good. Just to telegraph forward, that testing is duplicated in the spring of 2019 by ARA and also shows the macrotexture texture was good, a finding with which Dr. Flintsch agrees.

Dr. Uzarowski's evidence is that the British pendulum test was very variable. He considered that was because of the weather conditions during the testing and he described the findings from the BPT as unreliable. Again, a finding with which Dr. Flintsch agrees.

Mr. Moore's response recorded by Dr. Uzarowski in his notes were that the results were inconclusive. And I note the word because it becomes a refrain repeated for all --

the description of all future testing by Mr. Moore, but also by Mr. Becke and Mr. Oddi. Mr. Beck's evidence he didn't recall receiving the results of the BPT but recalls hearing that the testing was inconclusive.

Mr. Oddi's evidence is consistent that he recalls Mr. Moore describing the friction numbers as inconclusive. Because he did not consider the BPT data to be reliable, Dr. Uzarowski also presented the summary of the 2007 and 2013 friction testing results conducted by MTO and Tradewind respectively. Although none of the Hamilton witnesses recalled Tradewind being specifically identified by name, Mr. Becke recorded in his notes, and I quote, concerns with friction numbers. Neither Mr. Oddi nor anyone recall a discussion about frictional characteristics.

Dr. Uzarowski presented the results in the PSV testing of the aggregate removed from the in service asphalt which had a PSV value of 45. He characterized it as medium, and his notes record his view that it was somewhat risky to reuse it in the surface course. Dr. Uzarowski relates that the contractor who they

were -- had been communicating with who had the experience with HIR, Mr. Wiley, Dr. Uzarowski reported that Mr. Wiley had not done HIR of SMA and did not want to do it on the Red Hill because it was a main road.

Dr. Uzarowski also relayed that the MTO guidelines did not allow HIR of a stone mastic asphalt and he repeated his concerns about using it as a technique.

The Hamilton witnesses don't specifically recall a discussion about PSV testing, but Mr. Becke's notes indicate that he understood or at least understood at the time that the consequence of the PSV testing meant that there would have to be a change in addition of aggregates to the mix adding beneficiating mix and the HIR process would change the SMA and that the gradation and the aggregate may change.

So in other words, although he's not recalling the specific discussion about PSV, he is recording what he understood the consequence, which is you would have to significantly change the existing aggregate in order to have an HIR that would meet an acceptable standard.

And Dr. Uzarowski's notes record that if he said if HIR used he recommended microsurfacing to address the possible HIR resulted in inconsistencies, and most of the witnesses confirm that Mr. Moore said no to microsurfacing. Mr. Oddi confirmed that Mr. Moore dismissed the idea. And again at the time Dr. Uzarowski was unaware that the 2014 Golder report and the appended Tradewind report had not been shared with anyone at City staff.

Dr. Uzarowski's notes of March 9 record his question what to do with the test results PSV. Dr. Uzarowski sent a follow-up e-mail to Mr. Becke on March 15 requesting a call relating to the Red Hill Valley Parkway and his notes of the same day record details of the conversation with Mike Becke. The note entry includes test results, leave them.

Dr. Uzarowski's evidence was that his understanding of the outcome of the discussion with Mr. Becke was that Golder would not repeat the BPT testing and the City did not require a formal report on the 2017 pavement evaluation, recognizing that the PSV testing was to be incorporated into whatever the -- into their

analysis for the 2018 -- what became the 2018 HIR suitability study.

Dr. Uzarowski's evidence is that he was first asked to prepare a final report for the 2017 pavement evaluation by Mr. McGuire on November 29, 2018.

There is a meeting on December 18 with -- between Dr. Uzarowski and Mr. Moore, who is the new director of engineering, and Dr. Uzarowski's evidence is that he provided Mr. McGuire with the historic information about the paving friction testing records and recommendations that Golder had provided. Delivered a hard copy of the draft 2017 pavement evaluation, and Dr. Uzarowski's evidence is that this is first time he was made aware the Golder report and the appended Tradewind report had not previously been shared internally at the City and that Mr. McGuire had found them recently. It was also the first time he was informed of CIMA's engagement by the City to provide road safety consulting advice and that CIMA had been advising the City about safety aspects and collisions, including speed.

Golder submitted the final

version of the 2017 pavement evaluation to the City on March 1. From the time when it was requested on November 29, 2018 to the first draft on December 18 and when it was delivered on March 1 reflected Mr. McGuire's repeated follow-up questions, further research that was required of the consequence, the involvement and back and forth with Hamilton's auditor and Golder's own internal scrutiny in risk management as it became increasingly apparent that the City was looking for reasons to blame Golder for its own failure to action any of the Golder and Tradewind's findings, analysis or recommendations.

Golder continues in summer of 2018 with the hot in-place recycling engagement. Following the meeting of March 9, Dr. Uzarowski had a follow-up discussion with Mr. Wiley who is the paving contractor in BC who has done the -- has significant experience with HIR, and he discusses again the feasibility of using HIR on the stone mastic asphalt. At this point Mr. Wiley seems to have contemplated that it might be possible.

On March 15, 2018 Dr. Uzarowski further reported to Mr. Moore on his

discussions with Mr. Wiley, stating that Mr. Wiley is now in agreement to carry out this project.

On May 14, 2018 Dr. Uzarowski attended a meeting at the City to discuss the feasibility of HIR on the Red Hill. Mr. Becke sent a calendar invitation to a number of people entitled "Testing Red Hill Valley Repaving HIR" and noted the reason for the meeting was to get sampling going.

Dr. Uzarowski's notes of the meeting record that amongst other things, sampling on the Red Hill to assess feasibility was discussed, and his evidence is that again he raised again his recommendation to conduct shot blasting as an interim measure leading up to the resurfacing of the Red Hill so as to improve frictional characteristics of the pavement, and his evidence is again that Mr. Oddi and Mr. Becke dismiss this recommendation.

And here we've got in the summer Golder was on site sampling -- taking large samples of surface course of the Red Hill in order to carry out the sampling necessary for the HIR engagement, and the evidence is that there was discussion between Dr. Vimy Henderson and Mr. Mike

Becke. Dr. Henderson doesn't particularly remember the exchange, but it appears that as a consequence Dr. Uzarowski e-mailed the Tradewind report to Mr. Becke on August 27, 2018, noting "as requested."

Mr. Becke's evidence was that he raised with Dr. Henderson that all he had heard was that the results were inconclusive. And Dr. Henderson asked "have you seen the report," and in response to Mr. Becke saying he hadn't, Dr. Henderson said "we'll send it to you."

On October 18, 2018 there's an informal meeting with Mr. Becke at which Dr. Uzarowski presented him with hard copies of the initial gradation results for the HIR suitability study, and Dr. Uzarowski offered his preliminary opinion that although hot in-place recycling of the stone mastic asphalt was likely theoretically possible, it would be extremely difficult and expensive to implement on the Red Hill.

In response Mr. Becke conveyed that the City had already decided not to use HIR to resurface the Red Hill, but to repave it. Nonetheless, Mr. Becke instructed Golder to

continue its evaluation of the suitability of HIR and deliver its reports.

Dr. Uzarowski delivered a draft of the HIR suitability study including laboratory results on December 21, 2018, and the final report was delivered to the City on March 11, 2019. The report concluded that while hot in-place recycling of stone mastic asphalt was theoretically possible, it necessitated the use of a significant amount of beneficiating mix which would result in substantial cost increase compared to conventional resurfacing. In other words, it's not cost efficient.

Commissioner, I'm about to go into the second part of the summary so I'm wondering if it would now be an appropriate moment to take our 15-minute morning break so I can have a glass of water.

JUSTICE WILTON-SIEGEL: That would be fine. How much time do you think you will require for the second part?

MS. JENNIFER ROBERTS: I will be under an hour, I think, subject to your questions, but I think I will move this along.

JUSTICE WILTON-SIEGEL: And

then let's take an hour and we'll return at 11:00 o'clock.

MS. JENNIFER ROBERTS: Thank you.

--- Recess taken at 10:43 a.m.

--- Upon resuming at 11:00 a.m.

MS. JENNIFER ROBERTS: May I begin?

JUSTICE WILTON-SIEGEL: Yes, please do.

MS. JENNIFER ROBERTS: So the next part of my submissions are the second part of summarizing some of the findings, and I will try and not repeat what I have addressed earlier.

So first of all, one of the explicit objectives in choosing to use SMA asphalt was we anticipated that it would provide good and enduring frictional performance. And as we know, whether an asphalt does in fact provide good frictional performance largely depends on the characteristics of the aggregates within the mix, and to this end, much of the verification process for the asphalt mix proposed by Dufferin focused on the characteristics of the aggregates. I'm not going to go back to it except to note that

reasonably there was every expectation that the Varennes Demix aggregate would provide good resistance to polishing and good frictional performance.

As we know, in 2007 after completion of the paving but before it's opened to the public, Dr. Uzarowski requested and MTO provided friction testing of the newly paved RHVP, and that was essentially to assess the extent to which it, because of the early age friction issues that had been identified by the MTO with SMA, whether that was a concern with the SMA asphalt that had just been laid on the Red Hill. And Dr. Uzarowski considered that the results were good, given the comparative experience of similar SMA asphalt mixes on MTO highways and that the surface friction would quickly increase significantly once the initial surface began to wear, exposing the aggregate structure. And in fact, the evidence we can now see from the MTO when the testing conducted on 2008 was that Dr. Uzarowski was correct, the results in 2008 showed that the frictional characteristics significantly improved, showing friction averages of FN between 38 and 41.

As observed by Dr. Flintsch, the surface friction of the Red Hill in September 2019 after resurfacing was only slightly higher, between 40 and 44; those are the values measured by ARA in September of 29.

MTO continued to conduct friction testing of the Red Hill from 2008 to 2014 as part of the verification characteristics of the aggregates, which was included in the MTO's DSM list for aggregate appropriate for high speed, high volume roads in 2009. The MTO evidence is that friction stabilized at averages around FN31 to 33.

They observed -- Mr. Gorman observed that he had hoped it would have stabilized at 35, but it stabilized above 30, between 31 and 33 as I said, and was therefore considered acceptable for the MTO or its continued placement on the DSM list, remembering, as I'm sure you're going to hear from the MTO witness, that they are looking at friction alone without knowledge of anything that's happening on the Red Hill.

Dr. Uzarowski's evidence was that he was not aware that the MTO continued to

(skipped audio) from 2008 and 2014 until 2019. And there's one odd piece of evidence that I'm going to cover off. It's in relation to MTO testing of the Red Hill in 2010.

The testing in 2010 was conducted at a hundred kilometres per hour and not 90 and the results were therefore anomalous because of the test speed, which the MTO ultimately realized and corrected.

But the result of the anomaly was that there was an apparent drop in the friction results. And Ms. Lane -- Becca Lane of the MTO, when she testified she said she would contact Dr. Uzarowski to obtain a contact for the City to discuss the results. And Dr. Uzarowski indeed had a note of November 15, 2010, which recorded Becca Lane, 2007 friction on RHVP, which corroborates that she did in fact reach out to him.

Now, his evidence was that he would have given Ms. Lane Mr. Gary Moore's phone number had he been asked for a contact, but neither he nor Ms. Lane recalled any detail of the phone call and specifically neither recall discussing the MTO's ongoing friction testing of

the Red Hill.

Dr. Uzarowski thought from his note that they likely discussed the early age low friction issue which was still very current in November of 2010, and Ms. Lane's evidence was that if she said she would contact the City she would have, but she's got no record and no clear recollection of a conversation with Mr. Moore. Mr. Moore has no recollection of being contacted by Ms. Lane.

Had Ms. Lane advised Dr. Uzarowski that the MTO continued to test and conduct friction testing on the Red Hill, I am completely positive there would be a note recording that, and there's not such a note and no evidence that Ms. Lane told Dr. Uzarowski that the MTO continued to test.

JUSTICE WILTON-SIEGEL: So what do you think I should take of that?

MS. JENNIFER ROBERTS: It's intriguing but it doesn't go anywhere.

JUSTICE WILTON-SIEGEL: Yeah.

MS. JENNIFER ROBERTS: I sort of categorize it in my head as one of the many possible opportunities that was missed, right, and

there are any number here.

I've talked about the Tradewind friction testing and their finding that the results were generally below or well below the UK reference investigatory level. Both Dr. Uzarowski and Dr. Flintsch agree that those test results showed that the friction values on the Red Hill were relatively low.

Friction testing was conducted by ARA in May of 2019 using a locked wheel tester and by Englobe using a grip tester, and the evaluation of the ARA testing allows us to evaluate whether friction continued to decline or levelled off. And I asked Ms. Becca Lane specifically to address the testing conducted by ARA and she confirmed her view that the friction on the Red Hill had levelled off by 2014 and didn't decline further.

Ms. Lane's findings that the friction level levelled off around 2014 was agreed by Dr. Flintsch as well as by Mr. Hein. Dr. Flintsch cross-referenced the ARA data with testing conducted by Englobe using their grip tester in May of 2019 and Dr. Flintsch remained of the view that the ARA and Englobe testing showed

the frictional characteristics of the road surface were relatively low.

Mr. Hein disagrees. His view is that the deviations -- that he relies on the MTO practice for further investigation using what he describes as the guideline of FN30, and noted that the deviations -- the word deviations below 30 but considered them minor and inconsequential. And he stated:

"I have conducted friction testing results on various highways and have seen friction values for other highways in Ontario throughout my career. The RHVP friction test results are consistent on average for its age and are consistent with friction results I have previously seen on other highways."

And he did not agree with Dr. Uzarowski and Dr. Flintsch that the test results were relatively low incident but they were acceptable, applying the MTO's practice for evaluation.

The other testing I note is the 2017 pave and evaluation included the testing for macrotexture and that came back as showing good macrotexture, a finding that, as I said, was

confirmed by ARA's testing and agreed by Dr. Flintsch when he evaluated the test results.

And the point here, sir, that -- Commissioner, that I think warrants emphasis is that we've got testing that by -- in the opinion of the commission's expert Dr. Flintsch and Golder's pavement expert Dr. Uzarowski showed that friction was relatively low, but no one reviewing the results of friction testing on the Red Hill, not Dr. Uzarowski, not Ms. Lane, Ms. Senior, Dr. Flintsch, not Mr. Hein, identified the friction results as alarming or red flag, and this is categorically not a circumstance where friction by itself might be so low as to create a hazard.

I want to address the recommendations made by Golder to the City, and in doing so, at the outset, let me address some of the recommendations in the CIMA findings.

You raised the point yesterday that I would like to come back to. Golder wasn't aware of the CIMA investigations and the findings, and we know that they deliver reports in 2013 and 2015. In 2015 report they evaluated the entire length of the Red Hill.

And you raised the point yesterday and you said that Mr. Moore when he reviewed the draft 2015 CIMA report did not correct the design speed theorized in that 2015 report. And you'll remember that CIMA deduced what the design speed was for the Red Hill by relying on the usual standard that it would be 20 kilometres more than the posted speed. And in fact that's not correct, that the posted speed was 10 kilometres higher than the design speed and the design speed was from the outset 100 kilometres per hour, and that's clear from the preliminary design report and the revision in all of the internal design records going back to the early 2000s.

In fact, it's more than just the design speed wasn't provided by Mr. Moore. CIMA also wasn't provided the drawings and they didn't receive them until November of 2018 in preparation for the roadside safety assessment, and that's the first time that they know how tight the radius of the turns are. And I point it out because in reviewing the 2015 CIMA report you'll see that they speculate that the tightest turn is 525 metres, which is not the case. The tightest

one is 430 metres, which was the very edge of what was recommended in the MTO 20 -- 1985 design guide.

And there's a particularly -- and the other thing that they don't know because they don't have the drawings is they don't have -- actually they don't have the distances between the interchanges and they don't have the design for the weaving lanes. And one of the things that CIMA observes in its report is that they are observing that the behaviour of people getting on and off Red Hill is somewhat aggressive merging, and they write this may be due to a potential perception by drivers that some acceleration lanes along the Red Hill are too short and may contribute to sideswipe and single motor vehicle collisions.

Well, it's not just a perception that they are too tight, they are too tight. And I suggest to you that if CIMA had had that information in 2015 that would have been very helpful.

And the other piece of information of course that they are not provided but exists in 2015 is the Tradewind friction data,

and the findings by that friction expert and the findings of Golder's pavement expert that friction is in the standard applied by Dr. Uzarowski relatively low.

I'm going to address the recommendations in the various reports.

First of all, the Golder report, as you know, recommends the milling and overlay, crack sealing, and the application of microsurfacing to address the relatively low friction.

JUSTICE WILTON-SIEGEL: I wouldn't have put it in those terms.

MS. JENNIFER ROBERTS: Sorry? Did I misstate it?

JUSTICE WILTON-SIEGEL: Well, I mean, I think the focus of those reports is pavement rehabilitation.

MS. JENNIFER ROBERTS: Yes, I agree.

JUSTICE WILTON-SIEGEL: And incidentally, the recommendations will address any concerns for friction.

MS. JENNIFER ROBERTS: Right. And also I think the words Dr. Uzarowski used, it

will also address the relatively low friction.

JUSTICE WILTON-SIEGEL: Right. I was just suggesting that to say microsurfacing was directed at friction is I think overstating the intention.

MS. JENNIFER ROBERTS: You're quite right.

JUSTICE WILTON-SIEGEL: The focus.

MS. JENNIFER ROBERTS: It is primarily to deal with the pavement preservation and also address the Tradewind finding.

Dr. Uzarowski is covering his own recommendations in terms of his finding of the pavement condition, but also the findings from the friction expert who is saying that they know by their evaluation that it's low or well below the standard. Now, Dr. Uzarowski doesn't agree with that -- with that evaluation, but concludes it's relatively low and so his recommendation addresses both problems.

Dr. Flintsch, when he reviews the recommendation about pavement, and this perhaps goes to your point because Dr. Flintsch then is evaluating that recommendation in

isolation from whether it's appropriate to deal with the pavement condition. But the point is I think an important one to make, that Dr. Flintsch agrees that the combination of resurfacing in some areas and microsurfacing would have addressed the low friction issue at that time.

So let's apply some -- contemplate that that work had been done as it was originally programmed by Mr. Andoga in 2016 we might not be here, frankly, or we wouldn't be here.

Golder's advice to use microsurfacing as a method to improve frictional characteristics was consistent with the recommendations in the PMTO reports, but it's also consistent with Stantec's recommendations in its 2007 sustainability plan.

It describes, in sample, preventative techniques, includes a description from microsurfacing, and Stantec notes that generally microsurfacing has been used on moderate to heavy volume roads to improve surface frictional characteristics to fill -- and fill wheel ruts. It also has been used to address pavement distresses such as ravelling, brushing

and to a certain extent to seal surface cracks.

(Skipped audio) advice to use microsurfacing to address the surface condition of the pavement was also agreed by Miller Paving. Although Miller does not address microsurfacing as a treatment to improve frictional characteristics it was certainly their view that it would have been appropriate to address the pavement surface condition of the Red Hill provided pre-construction repairs were made.

JUSTICE WILTON-SIEGEL: I take it the pre-construction repairs that they are referring to was routing and sealing of cracks.

MS. JENNIFER ROBERTS: We don't have detail of what they considered but they certainly thought that cracks needed to be sealed.

JUSTICE WILTON-SIEGEL: Some kind of sealant treatment.

MS. JENNIFER ROBERTS: Yes. And we know because of the inertial pavement study and the plotting that Golder did that at least Mr. Moore at some point was contemplating specific repairs of the surface, which is more than routing and sealing. That's mill and overlay.

We've got a series of

recommendations about using a shot blasting and skidabrading. Dr. Uzarowski's notes record and his discussion of the friction testing of the system were on February 7. His evidence, corroborated by his notes, was that if the City was not prepared to that use microsurfacing they could -- they should consider the use of blasting technique which would at least temporarily improve frictional characteristics. That's the first instance in which Dr. Uzarowski recommended shot blasting as a technique.

JUSTICE WILTON-SIEGEL: Sorry, which date are you referring to there?

MS. JENNIFER ROBERTS: That's February 7. That's when Dr. Uzarowski is presenting the Golder report to Mr. Moore, and his recommendation is to microsurface, but if that's not acceptable then at least use shot blasting to improve the frictional performance.

The next discussion that is had is March 4, and this is when Dr. Uzarowski presents the findings from the inertial profile testing.

JUSTICE WILTON-SIEGEL: That's 2010.

MS. JENNIFER ROBERTS: '16.

JUSTICE WILTON-SIEGEL: '16.

MS. JENNIFER ROBERTS: At this meeting Golder's evidence is that it again provided information as to how to improve the pavement characteristics, including friction, and again recommended microsurfacing. And Dr. Uzarowski's evidence, corroborated by his notes, he also recommended blasting, meeting.

This I find one of the interesting moments in the chronology because it's quite clear at the end of that meeting that Dr. Uzarowski goes out and goes digging into the question of, you know, what would it cost to use shot blasting or another treatment like skidabrading. He goes out and gets quotes. And there's a back and forth between Dr. Uzarowski and Mr. Moore in an e-mail exchange of March 15 and Dr. Uzarowski provides the quotation for skidabrading with just 300-and-something thousand. And it's clear there's some initial confusion that Mr. Moore seems to have misunderstood what was being provided as a quotation for the friction testing. Dr. Uzarowski clarifies that that's -- and says -- suggests that's too much money and he

suggests further friction testing could be done and then at least the worst areas selectively treated.

Mr. Moore's emphatic in his response. He says he's never heard of that technology and won't address the surface distresses and he's not -- does not think that they are interested. In other words, in response to the written communication providing a mechanism for how to improve frictional characteristics on the Red Hill, Mr. Moore conveys that Hamilton is not interested.

In his report Dr. Flintsch --

JUSTICE WILTON-SIEGEL: I think maybe that's overstating it. I think he's now saying this does nothing to improve the pavement surface issues that he's concerned about.

MS. JENNIFER ROBERTS: Agreed, it does. But I think it's clear he's not interested in treating just friction. That's how I take it.

JUSTICE WILTON-SIEGEL: Okay.

MS. JENNIFER ROBERTS: And I'll come back to it because there's more evidence on that part of his testimony.

In his report Dr. Flintsch agreed that shot blasting could be a good short term solution to address low friction, and Dr. Flintsch also considered the recommendation use shot blasting raised in 2018 that point resurfacing was contemplated and was a better long term solution.

And in the assumed facts Dr. Flintsch was asked about the application of shot blasting in 2018. And the point I wish to make is the recommendation was made in writing in 2016, and in cross-examination Dr. Flintsch acknowledged that it could have been used in 2016 and would have temporarily improved the frictional characteristics of the surface pending resurfacing.

Mr. Hein in his testimony asserted that shot blasting doesn't last very long, and I don't think there's great evidence on that because he also acknowledged that it was used by airports and would be used to last a year or so. So I think this incomplete evidence on that exactly how long it would last, and I'm sure that that depends on what treatment is used and the surface of the Red Hill. And I would comment only

is that that investigation as to whether shot blasting could have been a cost-effective interim solution pending resurfacing was never discussed internally by the City. It was refused. Not until 2018 at least.

In January of 2018 Dr. Uzarowski was first alerted by Mr. Hein to the fatalities. And this information comes a little bit more after than a month after Golder staff has witnessed first hand collisions on the Red Hill. And it is the case, Commissioner, that thereafter at virtually every meeting Dr. Uzarowski has with City staff he recommended shot blasting or skidabrading improve frictional characteristics of the surface pending resurfacing. His evidence is at February 23 he raised it, and this is the first instance at which Dr. Uzarowski recalled that he was told the City would not use the technique because it would be taken as an admission that friction was a concern.

And then again in the meeting of March 9, 2018 when Dr. Uzarowski is presenting the findings from the 2017 pavement evaluation. His evidence is at the end of the meeting he again proposed consideration of shot blasting or

skidabrading for now, and he was told no. And his note records no public.

In a meeting scheduled for May 4 to discuss the HIR of the Red Hill Dr. Uzarowski's notes include pavement condition blasting no.

Golder's recommendation in writing to rehabilitate portions of the Red Hill using microsurfacing as a preservation technique and to improve the relatively low friction weren't taken. Dr. Uzarowski's finding that friction was relatively low were not shared within the City and not shared with the City's road safety consultant CIMA.

Dr. Uzarowski's evidence given in writing to Mr. Moore on March 15 to use shot blasting or skidabraiding improve the frictional characteristics of the surface was not taken. His advice to use shot blasting or skidabrading was verbally reported in 2018 on at least three occasions.

Dr. Uzarowski is a pavement and materials engineer. He is not a road safety consultant. His opinion was the friction numbers on the Red Hill were relatively low and he

provided solutions how to improve the frictional performance. Certainly reporting the friction findings internally within the City in 2014 would have focused scrutiny on friction and would have allowed for a more thoughtful response. We do not know what CIMA would have contemplated had they had the opportunity to review the Tradewind report in 2014, 2015.

Some insight might be found in CIMA's memorandum of February 4, 2019. It reports their views that the friction findings obtained by Tradewind were above the designed parameters that were used on the road design for stopping distance and horizontal curve design. CIMA observed in that memorandum that friction measurements that are at investigatory levels are in no way definitive indication that the location is unsafe, and CIMA considered that further investigation of conditions weren't needed.

What just is abundantly obvious is that if they had the opportunity to review the Golder and Tradewind reports they would not have ignored them.

I note in his conclusion of Dr. Flintsch's analysis of friction he observes

that -- says:

"In conclusion it's my view that the very high percentage of collisions during wet conditions combined the friction test results in the Tradewind report as well as the MTO measurements was an indication that the relatively low friction contributed to those collisions, together with excess speeds and the geometry of the freeway which give rise to an elevated friction demand and, thus, collectively supported the previous stated need for detailed safety analysis. It could have resulted in a decision to apply a treatment to improve the frictional properties of the pavement surface such as resurfacing or microsurfacing."

What is obvious in hindsight is that the Tradewind data and Dr. Uzarowski's recommendations for techniques that could have been used to improve frictional characteristics should have been shared within the City and with CIMA. The city would have had far more information about frictional characteristics and a whole different set of tools to improve them.

Among the many opportunities lost, the City and CIMA could have considered the

selective application of the technique to improve frictional characteristics for at least the middle section of the Red Hill in locations where by 2015 CIMA expressly knew that there were densely located and disproportionate number of wet weather collisions. As Dr. Uzarowski stated in his testimony, it would not have hurt and it might have helped.

I'm going to address through the evidence of -- the exchanges between Dr. Uzarowski and Mr. Moore what was done with the Golder report.

Certainly Golder reported their findings and recommendations to a senior level within the City and reasonably expected that they would have been assessed and implemented as the City considered appropriate.

We know that Mr. Moore understood Golder's advice in relation to rehabilitation preservation of the asphalt. There were three aspects to that; the mill and overlay, routing and sealing and the microsurfacing.

In relation to the mill and overlay, Mr. Moore considered that it was not a surprising recommendation inconsistent with what

he had expected, and then in his evidence he noted that the importance of sealing the top so you don't have to rebuild the rich bottom mix layer.

As I indicated in my earlier submissions, it seems that some of Golder's submissions seem to percolate through into the contemplated 2016 pavement evaluation. It's intriguing, although I agree with you Commissioner I'm not sure that they are not two solitudes proceeding. Although, as I said, I do think it's the case that some of the findings that Golder made are being reported to Mr. Andoga.

It's not expressed in contemporaneous correspondence, but Mr. Moore's evidence was that he disagreed with Golder's recommendations to use microsurfacing. As I said earlier, he testified that the City had a poor experience with it. He did not specifically recall the discussion but he said at some point he would have made it clear that microsurfacing was not something that they would consider. So there's no ambiguity that Mr. Moore knew what microsurfacing was and what it did. He was emphatic and he didn't agree with the advice.

An intriguing piece in the

evidence is what Mr. Moore took away from the friction testing data and Dr. Uzarowski's analysis of it.

In his testimony Mr. Moore said that he had no knowledge and had never heard of the UK reference standard for an investigatory level and didn't know how it applied and didn't understand how the friction numbers could have been good in 2007 after paving and then they weren't good. He thought it made no sense, he said. He said that until the friction results could be explained he was not going to expend any funds or take any action.

And this theme of -- this being uncertain -- and he later describes it as inconclusive -- becomes a reason, a justification for why the friction data is not reported internally.

Dr. Uzarowski's evidence was that Mr. Moore didn't raise any questions about Tradewind's findings or his analysis of them when he sent the Golder report or when they met on February 7. And further we've got -- as I said earlier, we've got Mr. Moore's evidence that when he's commenting on the 2015 CIMA report and

deletes the entirety of the friction testing section, his view is that there's no basis, nothing to compare friction testing to and no agency, including the MTO, doing this. And he doesn't think the testing means anything except proving potential exposure.

There's no record that Mr. Moore raised any question about the Tradewind data until December 17, 2015, and then that's only after CIMA had recommended friction testing on the Red Hill in the 2015 CIMA report. And Mr. Moore had asked on August 7, do you have a performance specification and are there -- are the values used the same methodology and are they comparable.

JUSTICE WILTON-SIEGEL: I'm getting a little lost here. Are you working from particular paragraphs in your submission?

MS. JENNIFER ROBERTS: I've tried to summarize what is in my submission so because I thought --

JUSTICE WILTON-SIEGEL: I'm trying to put together a few different things, and I'm not sure how you put them together.

There's the discussion with Mr. Malone which seems to be to the effect that

there is testing, that the testing is comparable, but he's not going to say what the standard is because he thinks there's some liability concerns associated with that, and Mr. Malone is told to keep these numbers to himself.

Then there's the statement in October which is get rid of this section on testing because there is no standard.

And then there is the discussion in the public works committee which is, we have this testing, both in 2007 and 2012-13, and it's reliable and it shows the highways performing very well.

And then we have the discussion that arises out of his sending the summary information to Dr. Uzarowski in the middle -- starts in the middle of December after that PWC meeting in which the question of viable standard or reliable standard exists, and he's eventually told there isn't any way of correlating this UK standard to the MTO testing.

How do you put all of that together? Or do you?

MS. JENNIFER ROBERTS: I have a very hard time doing that and I'm grateful it's

not me trying to make findings of fact or credibility on this particular section.

I'm interested by what Mr. Moore doesn't do, and it's clear he doesn't share what the experts say about the friction numbers. It seems as though the confusion suits him and that may be -- you know, and that may be what we take from his comments in October on the CIMA report. Because at this point we're -- 2016 he's had this data for two years and he hasn't done anything with it and hasn't shared it. Is he -- I don't know, I'm speculating. Careful in fairness.

Let's not lose sight of an important fact and that is, and I'll come to it, Mr. Moore's view that there's no -- and I'll come to his evidence later, he says this, he doesn't think that friction is an issue. Let's not lose sight of the fact that Mr. Hein agrees with him, that friction on the Red Hill is acceptable. That would have been a valid finding.

But what is interesting is that he doesn't share the information internally and so it's him making that decision, and that I think is where the problem is.

What I want to note is that -- and I think this may be -- is responsive to your point. There's a whole pile of sort of what I would say are after the fact justifications as to why the Tradewind report is not shared. One, he starts with well, I was trying to get clarification for the data, and then he says he doesn't -- he never got clarification of the data, and then you'll see in the narrative that he considers that the findings were inconclusive.

And later we see that the City seems to suggest that the reason why the report wasn't shared internally was because it was in draft, and that doesn't go anywhere because it's not how it was treated by Mr. Moore.

So I see those as being after the fact reasons to explain, justify why the report wasn't shared. But I do think the testimony reveals that Mr. Moore, you know, did his own evaluation and he's informed. I think that he didn't accept Dr. Uzarowski's finding that the friction numbers on the Red Hill were relatively low and he didn't agree that there was necessary for treatment that only addressed friction. That's implicit in his conduct but it's

explicit in that response of May 15, 2016.

In his testimony -- and this is in the context of the evidence about the March 15, 2016 e-mail exchange. In his testimony around that Mr. Moore said he did not ask Dr. Uzarowski to investigate measures that would increase the skid numbers on the Red Hill. He stated that he did not believe he ever asked for that. He explained:

"I don't believe I was looking in any way to address any frictional characteristics because I had no concerns with them."

I think that that's the tell. I think that he -- long and short, he didn't agree with the advice that the friction was relatively low and did nothing with them, not because there was any uncertainty or he was waiting for further information, but because he himself had made the decision that there were no concerns with frictional characteristics. He had the information, he understood it, and he made his own determination. But he ignored the advice of this pavement consultant and he did nothing to share that information to get the input of CIMA or

anybody else.

I just note that -- if there was any confusion about -- or he wasn't comfortable, confident with the use of the grip tester there is absolutely no reason why he couldn't have commissioned or asked MTO for friction testing to be done.

The discussion in March of 2016 is another -- what I would say is another missed opportunity. Like, if he didn't like the grip tester numbers he could have in the spring, not November, December, he could have asked for friction testing to be done and -- you know, if it were the case that he thought that there was or he wasn't comfortable with the grip tester numbers.

I'll go back to the point -- and I think it's the lost opportunity. Not to have shared that information internally, not to have shared it with CIMA. We don't know what they would have done. I tend to think your point that you made yesterday that they would have looked very hard at speed much earlier than they did might have been an outcome. And as it was, that wasn't changed until early 2019.

I have addressed in my

submissions in a very general way the issue of factors that may contribute to collisions. I want to note that Golder from the very outset has raised the issue of geometry as an important contributing cause and we see in the findings of Dr. Flintsch and Mr. Brownlee, the Commission's road safety expert who described the important contributing factors of the geometry of this road.

When we looked -- Golder looked very hard to see whether there was a connection between any of the detailed findings of friction and the location of collisions and we can't find one. There isn't one. I think if someone had found one there would be evidence on it.

What you can see, and the graph that I have in the -- in our submissions, plots the friction numbers from the ARA against the location for collisions and the friction numbers are relatively consistent. But what you see at specific places, which is particularly in the section B where there are really tight radius turns and tight interchanges, you see significant numbers of collisions. That's got nothing to do with friction. That's got everything to do with a

geometry and the demand on friction.

JUSTICE WILTON-SIEGEL: Is another way of what you're saying that friction by itself is not sufficiently low in any of these areas to be a cause of the increased accident experience in the area, but together with the geometry which places a demand, higher demand for friction, at the levels at which friction appears to be tested, it may be a contributing factor? Is that what you're trying to say?

MS. JENNIFER ROBERTS: That's exactly what I'm trying to say. Friction by itself is not the primary cause of collisions on the Red Hill.

JUSTICE WILTON-SIEGEL: But it's the second half that I'm more interested in.

MS. JENNIFER ROBERTS: No, I agree and --

JUSTICE WILTON-SIEGEL: -- areas of high friction demand where the friction levels can come into play.

MS. JENNIFER ROBERTS: Yes.

JUSTICE WILTON-SIEGEL: Okay.

MS. JENNIFER ROBERTS: We have included in our submissions and tried to address

some of the policy considerations. And I go back to a point that I've made, and that is the sharing of information between the consultants.

The City had retained -- City has not never in this piece lacked for sophisticated consulting advice. The narrative of the inquiry records is a who's who of preeminent engineering firms and operate in Ontario. But what didn't happen is that information from one consultant wasn't shared with another. And there would have been an opportunity for collaboration.

And as I said, in one of the points -- since CIMA raises it a couple times whether there would be a potential for high friction road surface. They contemplated in 2013 in relation to ramp 6 and they raise it again I think in 2015. Coordination with Golder and talking about what tools were available to improve friction, one would have thought would have been fruitful, or could have been.

Commissioner, subject to your questions those are my submissions.

JUSTICE WILTON-SIEGEL: I don't have anything further. Thank you.

MR. LEWIS: Commissioner, the

MTO is up next. It's 10 to 12:00. I'm not sure what counsel wants to do in terms of jumping in or if they need any time.

MR. BOURRIER: I'm happy to start my submissions, if that's your preference. I don't think I'll be two hours. So I'm happy to start and see how far we get before the lunch break.

JUSTICE WILTON-SIEGEL: That's fine. We'll take our break at 1 o'clock as usual, unless at some stage you think it's appropriate to break a little before that.

MR. BOURRIER: I will let you know, Commissioner.

JUSTICE WILTON-SIEGEL: Thank you.

CLOSING SUBMISSIONS BY MR. BOURRIER:

MR. BOURRIER: I will be giving the oral submissions today on behalf of Ontario.

I'm not going to address all of the issues that concern the MTO in this inquiry. I'm going to refer to our written submissions for any supporting evidence to our fulsome arguments. I'm going to focus instead on

what I think are some key points to assist you in understanding our position. I propose to give my submission in four parts.

First, I want to look at the questions and the terms of reference that need to be answered in respect of the 2007 friction test by the MTO. First is the questions that you are tasked to answer in terms of DSM testing by the MTO from 2008 to 2014.

Second, I want to look at the 2007 friction testing, the particular purpose of that testing and why it was conducted for a different reason from the DSM testing.

After that I will look at the specific facts of that testing, the 2007 testing, and explain our position that the test results were acceptable and that our dissemination of the results was appropriate in the circumstances.

Fourth and last, I'll look at the DSM test results and highlight -- our position is that those results were also acceptable and that our distribution of the results was appropriate in the circumstances, including what we say is an escalation of the 2010 DSM results by Ms. Becca Lane.

First -- I'll just note in the terms of reference it's Roman numeral 16 to 20, there are a number of questions that you were tasked to answer that relate to what is referred to as the MTO report and the terms of reference. I'm going to refer to it as the 2007 friction results in my submissions because I think that's a more accurate description of the results.

As you've seen from the evidence, the 2007 friction test results were in the form of raw skid data. They were not a formal engineering assessment with analysis.

The questions that you have to look at for that 2007 friction test is with whether it provided support or rebuttal to conclusions of the Tradewind report, why were those results not provided to counsel or made publicly available, who within the Ontario's office knew about the results, did the results contain findings information that would have triggered counsel to make safety changes to the roads, and whether failure to disclose those results contributed to accidents, injuries or fatalities on the Red Hill.

That's in contrast with one

question that you were tasked to answer in terms of the DSM results, and that's question 21 in the terms of reference, and it is, did the MTO request direct or conduct any friction tests, asphalt assessments or general road safety reviews or assessments on the Red Hill other than the 2007 friction results.

Now that I've situated that the two different types of tests -- it's important to keep in mind when looking at the evidence in the inquiry that MTO connects friction testing for different purposes. It's the context of the testing that informs how MTO conducts the thing and also how it reviews and assesses the friction results.

Neither the 2007 friction testing or the DSM testing was conducted pursuant an internal friction request for testing.

You posed a question to counsel for the City about these types of requests and I just want to highlight that that is when a region identifies an infield concern with a particular road. For example, if they notice visual abnormalities on the road.

The pavement and foundation

section would then conduct the friction testing based on information they received from the region. For example, what location to conduct the testing on. So it is done with information already about what the MTO is looking for.

The 2007 testing and the DSM testing is also not network level testing. The only reason I mention MTO's network level testing is to explain why we don't have any DSM friction results for 2013 for the Demix aggregate. In 2013 MTO was conducting its internal network level friction testing, and the skid trailer was being used for that purpose.

That brings me to the category that the 2007 friction testing by the MTO falls under.

JUSTICE WILTON-SIEGEL: Just before we do this. You properly noted the difference and -- expanded. There's testing for DSM purposes, testing at the request of the region. My understanding, which I just want to review, is the testing for DSM purposes would use FN30 as a fairly important consideration. If it's above FN30 then that would seem to indicate that the aggregate is acceptable, although one would

like to see somewhat higher numbers.

But in terms of testing for a region the FN30 level is a little bit more flexible. It can be more or less than that depending upon various factors that might barrier on the significance of friction demand in respect of the road segment being identified or being tested.

So if the geometry is particularly severe then perhaps a number close to, but even if above FN30, would dictate that the friction characteristics be looked at a little bit more carefully than if the geometry was relatively flat and straight, in which case friction levels would seem to be rather less important.

Is that a fair summary of the evidence as you understand it of the MTO?

MR. BOURRIER: I think that is a fair summary. The only qualification I'll add is the FN30 number is being looked at by the soils and aggregate section for the DSM testing. They are the ones who are directing the paving evaluations (skipped audio) to conduct the testing. They also have information about the particular aggregate that they are testing.

So, for example, geologist is looking at these particular test results. So they are also looking at the results, keeping in mind information they already have about that particular aggregate. So, for example, they may expect something from an Ontario Trap Rock versus a different type of aggregate. So in that sense it is still a bit of a general guideline because they may expect more from a particular aggregate than another one based on the laboratory tests that they have and the research they have for that particular aggregate.

JUSTICE WILTON-SIEGEL: So what you're saying is even in the case of DSM testing FN30 is not an absolute standard.

MR. BOURRIER: Correct.

JUSTICE WILTON-SIEGEL: Okay.

MR. BOURRIER: As I mentioned, the 2007 friction testing was pursuant to a request from an external entity. I just want to go over what the general policies are for an external request, which is that the pavement and foundation section head would assess whether MTO can accommodate the testing. The province's own friction testing needs to be prioritized over

external testing and it's carried out as a courtesy when resources permit.

If the MTO is unable to carry out friction testing, one external entity, information is typically provided to the requester about available alternatives such as private friction testing companies.

If MTO conducts the testing the requester is provided with the raw data friction test results, the requester may be provided with high level explanations of the data but MTO personnel would not prepare additional analysis by way of reports or assessments for external entities, although they would be at the liberty to engage consultants to do so where desired. So MTO would not place restrictions on how the external entities uses the data.

In terms of the specific facts of the 2007 friction test on the Red Hill, I'm not going to go over all of the details because it's already been discussed. But in September 2007 Dr. Uzarowski e-mailed Mr. Raymond and requested that MTO carry out previously discussed friction testing on the Red Hill.

He was referring to a

discussion in July 2007 where Dr. Uzarowski informed Mr. Raymond that the City may ask MTO to conduct friction testing on the Red Hill prior to its opening.

In October 2007 Mr. Marchello conducted friction testing on the Red Hill using the MTO's skid trailer.

A few key things I want to know about the particular type of testing is that it was very limited. It was approximately 3.8 kilometres in length on a section of two southbound Red Hill lanes. That section was clear enough in order for Mr. Marchello to conduct the testing due to the ongoing construction activities on the Red Hill.

The next day, so October 17th, 2007, MTO reviewed the results and concluded they were acceptable. In fact, they considered the results higher than those that they collected on pavements at the time that were presenting early age SMA issues.

The following day Mr. Raymond provided the 2007 results to Dr. Uzarowski and Mr. Delas Reyes of Golder. Mr. Raymond requested that they distribute the 2007 results to those

involved with the Red Hill project. He also offered to assist if they had any questions about the 2007 results. 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 Red Hill after the 2007 testing.

To sum up, the 2007 friction results. As I said, MTO viewed them as acceptable. They also viewed them as acceptable keeping in mind what category this testing fell under. The request for testing didn't arise in the context of an identified pavement performance concern. It was of a general nature to shed light on the frictional qualities of the Red Hill before it opened to the public.

In terms of how MTO distributed the results we say that that also was entirely reasonable. The friction test was conducted pursuant to a press from Dr. Uzarowski on behalf of the City. The results were provided by Mr. Raymond promptly to Dr. Uzarowski indicating that he should share them with those involved in the project as necessary.

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 Red Hill at this time.

I would like to turn now to the DSM testing from 2008 to 14 with the exception of 2013.

Again as I've mentioned, this testing is now being conducted for a different purpose, for internal testing for the DSM list. A significant number of a proportion of MTO friction testing work is conducted at the request of the soils and aggregate section. They are the custodian of the DSM list. The purpose of the DSM list friction testing is to assess whether an aggregate has suitable frictional qualities particularly in the long term.

After the testing is completed the pavement evaluation supervisor typically sends the results to the soils and aggregate section head as well as the geologist responsible for DSM management. A copy is also sent to the head of the pavement and foundation section, but that is more for work tracking purposes since the pavement

evaluation supervisor's direct manager is the head of the pavement and foundation section. But it is a soils and aggregate section that is directing this type of testing.

The normal procedure is that DSM applicants are not provided with copies of the friction tests themselves, however where an application is satisfactory the applicant would be informed by a letter from the soils and aggregate section that the aggregate has been accepted for inclusion on the DSM list.

In that correspondence it would be confirmed that the aggregate has achieved satisfactory infield testing results for two consecutive years and that future testing will take place to ensure that the aggregate remains suitable for inclusion on the DSM list.

To sum up DSM testing in general, it is limited in nature. It's usually conducted on a straight section of the road and it's intended to assess long term aggregate trends. I said this already, but it is not conducted to identify whether a road -- its friction levels meets its friction demands.

I've situated DSM friction

testing in general, so now I would like to look at the specific DSM friction testing from 2008 to 2014. This has already been discussed so I will briefly go through how MTO considered these results.

The 2008 results were considered good by the MTO and acceptable for the aggregates potential DSM list inclusion if another year of acceptable results was obtained. That was the case. In 2009 the DSM friction testing was carried out and the results were considered acceptable as well.

As a result of that, the head of the soils and aggregate section informed Demix that the aggregate had qualified for inclusion on the DSM list, and it was noted in correspondence to them that the 2008 and 2009 friction results were considered acceptable by the MTO for DSM list purposes. As a result, the Demix aggregate was included on the DSM list in 2009.

As part then of the DSM list monitoring practices the aggregate was tested again in 2010, '11, '12 and '14.

I'm going to come back to the 2010 results, but for 2011 and 2012 MTO viewed the

results as acceptable for continued inclusion on the DSM list. As I mentioned before, there are no friction results for 2013 because of the network level testing that was occurring at that time.

In 2014 MTO viewed those results as being acceptable as well for continued inclusion of the aggregate on the DSM list. And the Demix aggregate was removed from the list in 2016, however we know from the evidence this was the result of a business decision by Demix to delist the aggregate.

I'll spend some time now just talking about the 2010 friction results and explain why we say that the evidence demonstrates that Ms. Lane did escalate to the 2010 friction results.

In terms of those results, MTO had formed a concern about declining friction numbers disclosed by this particular year. The initial results showed a drop in friction since 2009. The 2010 results were sent to Ms. Lane by Mr. Marchello on November 15, 2010. In response, she confirmed that she intended to call Dr. Uzarowski to ask for City contact with whom she could share the information.

With the passage of time Ms. Lane does not remember specifically doing so, however in her testimony she provided credible evidence that she said she would certainly have reached out to Dr. Uzarowski for contact information given that was her stated intent, and in turn she would have certainly contacted the city to inform them of the friction testing.

I think it's important to keep in mind that it was after Ms. Lane's testimony that her evidence was corroborated by evidence by Dr. Uzarowski in the form of a note that he made in this notebook. The note is made on the same day, November 15th, 2010. I appreciate that the note says "Becca Lane 2007 friction on the Red Hill Valley Parkway."

I think this suggests he did have a call with Becca Lane on November 15th. I appreciate he writes "2007 friction on the Red Hill" but that doesn't make as much sense given that Ms. Lane has said in her testimony that she was going to call on November 15th because -- and in response of the 2010 results.

I do note Ms. Lane doesn't remember the telephone call or what she said in

the call, and Dr. Uzarowski also doesn't recall what was said on the call, although he does rely on his note of that date to assist him.

Dr. Uzarowski also says that in addition to being sure that Ms. Lane did call him that he would have provided her with contact information for Gary Moore.

The last bit of puzzle on this I think is Mr. Moore's evidence. He did say that he was unable to recollect a conversation with Ms. Lane in around this time. However, he does acknowledge that it certainly could have happened and he also says there would be no reason to doubt Ms. Lane's evidence on this matter.

I think Ms. Lane has demonstrated that she is a very credible witness and she said she would call, and after the fact it was determined that she did.

If we combine the evidence of Ms. Lane, Dr. Uzarowski and Mr. Moore I think it must be accepted that Ms. Lane did inform Mr. Moore of the apparent drop in friction numbers between 2009 and 2010 shortly after November 15th, 2010.

As you are aware the concern

in respect of 2010 results did resolve itself in 2011. At that time it was discovered that the decline in friction levels as between 2009, 2010 was the result of human error.

Mr. Marchello had carried out the 2010 test at 100 rather than 90, a speed which was what he had tested in the prior years. Once the results were adjusted there was no concerns by MTO with respect to the 2009 to 2010 results. I also want to highlight --

JUSTICE WILTON-SIEGEL: Can I just ask you when exactly you think that correction occurred?

MR. BOURRIER: I can try and determine that for you, just give me one moment.

I don't have it readily available but I believe it was at the time of the 2011 testing, and I see --

MR. LEWIS: I believe Mr. Bourrier is right about that. It was at -- he corrected it at the time when he sent the results in 2011.

JUSTICE WILTON-SIEGEL: That was my impression but I just want to confirm that.

MR. BOURRIER: I just also

want to note that I think this evidence from Ms. Lane demonstrates that had similar issues arisen in the future they would have been handled in the same manner and that the City would have been informed, however MTO did not have any further issues with respect to the DSM testing in the subsequent years.

On the DSM friction test results. I just want to talk now about MTO's distribution of those results and why we say that that was also acceptable in the circumstances.

Unlike the 2007 results the DSM results were requested by the soils and aggregate section. As the testing was conducted to measure the qualities of the Demix aggregate and not to investigate any infield concerns, the results were not shared with the City as the 2007 results had been. Remember, those results were -- that testing was done at the courtesy -- by the MTO for the City.

MTO's distribution (garbled audio) results is also grounded in the fact that this testing is limited in nature. Again, it is primarily intended to assess the long term aggregate trends.

I also note in terms of the DSM results we had no concerns with them except for in 2010 where I say we took appropriate action, and neither Dufferin or Demix requested the DSM results from MTO at any time during the period that this aggregate was included on the DSM list, nor did anyone from the City.

Commissioner, those were the key points that I wanted to that cover in my submissions. I'm happy to answer any further questions you have.

JUSTICE WILTON-SIEGEL: Those are the key points you wanted to cover with respect to -- that's all four of the points?

MR. BOURRIER: That's correct.

JUSTICE WILTON-SIEGEL: The only question I have is with respect to your views as to jurisdiction. I'm going to ask whether this is what you are suggesting.

I think you're suggesting that as a commissioner of a municipal inquiry I would have the authority to recommend changes to the law or the regulations under respective laws that deal with the matters that are governed by the terms of reference but that I would not have jurisdiction

to address, if you like, the executive function of government, the actual operation of the executive, including policies or procedures. Is that the dividing line that you're proposing in your submissions?

MR. BOURRIER: That is correct, that's the line that we are proposing. And the point I just want to also add about that is I don't think you have the evidence before you to go there either. I think it's important to note that evidence has not been introduced in this inquiry about Ontario's policies, practices and guidelines about how they apply provincewide, especially considering the vast road network in Ontario and the different sections of the province, the very make-up of the province. That evidence just is not before you. So to make any at large analysis of Ontario's policies and procedures we would say is beyond the scope of the inquiry.

That being said, I don't disagree with what Mr. Lederman said yesterday on behalf of what he said in terms that you are tasked with answering the terms and questions and making factual findings in terms of those

particular questions. But we do note that that is only on whether there is friction standards in place in Ontario during the relevant periods and whether they were publicly available; not, for example, whether it should be implemented -- whether a friction threshold should be implemented on a provincewide basis.

JUSTICE WILTON-SIEGEL: Okay. Let me just take a look at my notes. Before we break -- I'm just going to suggest that we take a ten minute break which will give me an opportunity review where we are and address a few questions in my notes.

I'm assuming that without inviting any further submissions, that none of the parties have anything further they wish to address with the Commission; is that correct? I'll take the silence to be yes. So why don't we adjourn for ten minutes. It's 22 past, so we'll return at 25 to 1:00. Thank you.

--- Recess taken at 12:22 p.m.

--- Upon resuming at 12:36 p.m.

JUSTICE WILTON-SIEGEL: So this is the last day of the live-streamed public hearings. I will deal with any further

information that the inquiry receives, if it does receive any information from the participants or members of the public as I deem appropriate at the time.

Having completed the public hearings and having received the submissions of the participants yesterday and today as well as in written form 10 days on ago, my task is now to draft the report of my findings and my recommendations based on the evidence that we've heard. Once complete, my report will be delivered at the same time to the City of Hamilton, who have requested this inquiry, as well as the participants and the public to whom it will be released, as I say, at the same time.

Before we close this hearing I do want to thank all of the participants for their very thorough and helpful written and oral closing submissions over the last two days, and in particular, more generally, I want to acknowledge the work of counsel for the participants over the entire course of the inquiry. You have greatly assisted commission counsel and myself with the investigation.

I also want to reiterate the

thanks that I gave to the individual witnesses. I want to thank they can collectively. The many witnesses we heard from have assisted us immensely. I also appreciate the public's interest in the inquiry. And lastly I want to acknowledge commission counsel as a team for the work that they have put in in assisting me as Commissioner.

So with that, we will close these public hearings and as I say, the next and last stage will be delivery of my report. Thank you all very much. Have a good day.

--- Whereupon at 12:39 p.m. the proceedings were concluded.