

RED HILL VALLEY PARKWAY INQUIRY

TRANSCRIPT OF PROCEEDINGS  
HEARD BEFORE THE HONOURABLE J. WILTON-SIEGEL  
held via Arbitration Place Virtual  
on Thursday, May 26th 2022 at 9:30 a.m.

VOLUME 19

REVISED TRANSCRIPT

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1 Arbitration Place Virtual

2 --- Upon resuming on Thursday, May 26th, 2022

3 at 9:30 a.m.

4 MR. LEWIS: Good morning,  
5 participants, Counsel, Mr. Lee. If I could ask  
6 the court reporter to affirm Mr. Lee, please.

7 STEPHEN LEE; AFFIRMED

8 EXAMINATION BY MR. LEWIS:

9 JUSTICE WILTON-SIEGEL: Please  
10 proceed, Mr. Lewis.

11 MR. LEWIS: Thank you.

12 BY MR. LEWIS:

13 Q. Good morning, Mr. Lee.  
14 Thank you for coming.

15 A. Good morning.

16 Q. Just to start off I would  
17 just like to go briefly through your educational  
18 and work background at the MTO. So I understand  
19 that you have been employed by the MTO since  
20 June 1st, 2009 and are still there; is that  
21 correct?

22 A. Correct.

23 Q. And in terms of your  
24 education, you have a bachelor of science in civil  
25 engineering and master's in geotechnical

1 engineering from the University of Ottawa; is that  
2 correct?

3 A. Correct.

4 Q. Do you recall when you  
5 obtained those degrees?

6 A. I believe the bachelor is  
7 1982 and the master is 1988.

8 Q. And you're a practicing  
9 engineer and a member of the PEO; is that right?

10 A. Correct.

11 Q. And what were you doing  
12 right before you joined the MTO? What was your  
13 last job?

14 A. Before I joined the  
15 ministry itself my last career I was actually -- I  
16 actually started a number of firm that do carbon  
17 aggregation business itself in terms of creating  
18 carbon credits.

19 Q. I see. Okay. And then  
20 at the MTO itself I just want to go through your  
21 positions since you joined in June 2009. I  
22 understand that first you were the head of the  
23 central region geotechnical engineering?

24 A. Correct.

25 Q. That was from when you

1 started June 1st, 2009 to January 22nd, 2012; is  
2 that right?

3 A. Correct.

4 Q. And then you were the --  
5 became the acting head of the MERO bituminous  
6 section?

7 A. Correct.

8 Q. And that was from  
9 January 23, 2012 to October 1, 2012?

10 A. Correct.

11 Q. So just about nine  
12 months; not that long as acting head?

13 A. Correct.

14 Q. And then you became the  
15 head of the MERO pavements and foundations  
16 section?

17 A. Correct.

18 Q. And that was from  
19 October 1, 2012 to July 1st, 2019; is that right?

20 A. Correct.

21 Q. And then for a short  
22 period of time you were the acting head of MERO  
23 bituminous again; is that right?

24 A. Correct.

25 Q. And that was July 2nd,

1 2019 to October 4, 2019?

2 A. Correct.

3 Q. And since then you moved  
4 back to the head of MERO pavements and  
5 foundations; is that right?

6 A. Head of pavement because  
7 there's a reorganization.

8 Q. Right. And is it now  
9 called the EMO, engineering materials office  
10 pavements section? Is that what it's called now?

11 A. Correct.

12 Q. But it's the continuation  
13 of the same role but with pavements?

14 A. With pavement, correct.

15 Q. So with the exception of  
16 the period from July to the beginning of  
17 October 2019 when you were the acting head of  
18 bituminous you've been the head of MERO  
19 pavements --

20 A. Correct.

21 Q. -- with a change since  
22 October 1, 2012, right?

23 A. Correct.

24 Q. Am I correct that when  
25 you started on October 1, 2012 as the head of

1 pavements and foundations that you replaced Betty  
2 Bennett?

3 A. Correct.

4 Q. And she had been in that  
5 role for a short period after replacing Becca  
6 Lane; is that right?

7 A. Correct.

8 Q. Then I guess once -- that  
9 you reported to Becca Lane once she became manager  
10 of MERO in April 2013?

11 A. Correct.

12 Q. And could you just  
13 briefly describe your role as the head of  
14 pavements and foundations.

15 A. I guess the role of  
16 pavements and foundations -- there's three subunit  
17 within the pavement group. One group is basically  
18 doing pavement data collection for the ministry  
19 itself on pavement condition. The other group  
20 itself is pavement management system group whereby  
21 we actually take the data from pavement condition  
22 data and actually implement it into pavement  
23 management system to make position of budget and  
24 pavement rehab requirement of the ministry.  
25 The third group basically that I deal with in



1 pavement group is actually the pavement  
2 engineering group, whereby we look at all the new  
3 technologies, specification materials or  
4 technologies that can be used to enhance the  
5 ministry construction and specification of  
6 standard policies.

7                                 So on the pavement section we  
8 actually act as the headquarter for the regional  
9 (indiscernible) where we do the pavement design,  
10 pavement rehab. We basically help them to develop  
11 specifications, standard and policies and ensure  
12 the provincial consistency in basically applying  
13 the specifications, standard and policies.

14                                 Q. And under that role, part  
15 of it is the operator of the MTO's locked-wheel  
16 skid tester; is that right?

17                                 A. Correct. That is under  
18 the pavement data -- pavement condition data  
19 collection group.

20                                 Q. Okay. And so once you  
21 became the head of pavements and foundations Frank  
22 Marciello then reported to you until he left in  
23 early 2015; is that right?

24                                 A. Correct.

25                                 Q. And as we understand it,

1 until his departure he was the sole operator of  
2 the locked-wheel skid tester?

3 A. Correct.

4 Q. And we have heard  
5 requests for testing from -- for skid testing  
6 using the locked-wheel skid trailer would come  
7 from a variety of sources?

8 A. Correct.

9 Q. So from the regions, for  
10 example?

11 A. That I would say would be  
12 a primary -- two primary source of request. One  
13 is from the region, the other one would be from  
14 the designated source list where the ministry used  
15 that test protocol to put material that can be  
16 accepted for construction on ministry highways for  
17 our use.

18 Q. That's right. The second  
19 one being a request from the soils and aggregates  
20 section for DSM purposes?

21 A. Correct.

22 Q. Okay. And then the  
23 first, from the regions, typically those are -- as  
24 I understand it when -- there's request when they  
25 have apprehended that there may be an issue with a

1 stretch of highway identified a potential problem  
2 and then arising from that they want skid testing  
3 done to see what the friction is on that area of  
4 highway; is that right?

5 A. Correct.

6 Q. And then as well also  
7 from geotechnical offices?

8 A. Correct. Geotechnical  
9 office generally are the channel through where the  
10 region would actually request the testing itself  
11 because generally, as I said, as the pavement  
12 function itself, we are the headquarter for the  
13 regional geotech -- the regional office at the  
14 five region of the offices, but we actually  
15 (indiscernible) and actually look at how we will  
16 do thing consistently through -- at the provincial  
17 level through basically either GeoCon or the  
18 pavement section (indiscernible) advisory and  
19 technical support to the regional geotech offices.

20 Q. And you referred to  
21 GeoCon, that's the geotechnical committee?

22 A. Correct, whereby all the  
23 head of the five regions sits and so that's a few  
24 of them (indiscernible) and definitely pavement  
25 section that generally chairs the meeting.

1 Q. And I understand there's  
2 also occasionally, less frequently, there's  
3 external requests, for example, from police  
4 forces; is that right?

5 A. Correct. Sometimes from  
6 police, sometime from area municipality  
7 occasionally.

8 Q. And we've heard quite a  
9 bit of evidence about the MTO's use of the  
10 friction number 30 and of other numbers in  
11 evaluating skid resistance of pavement, but I  
12 would like to get your perspective on that. If  
13 you could describe what -- how you would describe  
14 the use of the FN30 number within the MTO and  
15 within your area.

16 A. Okay. I guess some of  
17 the knowledge of being engaged in the number of  
18 years in this discussion with various group itself  
19 on application of friction and having gone through  
20 the request of actually looking at writing a  
21 performance-based specification looking at  
22 friction number, the friction number itself is  
23 actually -- a single number itself is challenging  
24 because there are lot of factor that actually get  
25 engaged when you look at friction itself because

1 the speed -- for example, the speed of vehicle  
2 have a contribution. The state of your tire, is  
3 it bald or is it fully treaded have an  
4 implication. The geometry of the site itself --

5 Q. Sorry, before you get --  
6 I didn't quite catch what you said after the speed  
7 of the vehicle and then you said "the state of," I  
8 think?

9 A. The condition of your  
10 tire have a huge impact on the friction number.  
11 Is it basically bald -- is your tire with full  
12 tread or is it bald.

13 And geometry of the site  
14 itself is an important factor itself. Are you on  
15 a superelevated section. All this thing actually  
16 plays into a part. And even if that section, is  
17 it prone to icing up prematurely. And all these  
18 things have to be taken into consideration when  
19 you look at friction.

20 So in some sense as a guide  
21 itself we initially look at the friction number,  
22 friction number threshold, but then for  
23 determination, further determination we generally  
24 want to take a look at additional factors itself,  
25 even on mix. How is the mix on that section

1 placed, what is the aggregate composition of the  
2 mix and the gradation of the mix itself, the  
3 texture of the surface.

4 So in that sense, if you want  
5 me to judge friction itself now I would generally  
6 look at all those other contributing factor before  
7 I can make wholistic decision on what is the final  
8 action for that particular section, and it's  
9 actually site specific.

10 Q. Right, okay. And so I  
11 think you referred to the number 30, that it's a  
12 guide, and then that -- but it is a number, and  
13 then there's all the other factors that you are  
14 going to want to look at before a decision is made  
15 about whether or not any -- whether an  
16 intervention of some sort needs to take place or  
17 not; is that fair?

18 A. Yeah. And likely we  
19 break it down to up to a certain range we will  
20 look at the additional factor to make decision of  
21 further monitoring and continued monitoring, and  
22 does that number fall way below a certain critical  
23 number that has been established in some state  
24 jurisdiction that we would consider definitive,  
25 some action should take place in relatively

1 reasonable time.

2 Q. Sorry, and what number  
3 are you talking about there?

4 A. If it's tested at  
5 FN65 kilometres an hour, the number have to drop  
6 below 25.

7 Q. At FN65?

8 A. Correct.

9 Q. And sorry, then just to  
10 back up. You're saying if it drops below FN25  
11 tested at 65 kilometres per hour, then if I've  
12 understood you correctly, then you are much more  
13 strongly going to look at an intervention at that  
14 point?

15 A. Correct.

16 Q. But higher than that,  
17 over -- 25 and over I guess to I suppose 30,  
18 that's when you are looking at all of the factors  
19 that you just described; is that right?

20 A. Correct. And see what  
21 additional measure or monitoring required  
22 depending on all these factors in combination.

23 Q. And in between, you know,  
24 the 25 and 30, as you have described it, the --  
25 you know, arising out of those kind of -- the

1 investigation is one of the things that you might  
2 do is simply have further monitoring, further  
3 friction testing?

4 A. Correct. Continuing  
5 friction testing to see how the behaviour further  
6 down the road itself in terms of is the number  
7 decreasing, how fast it's decreasing, and all  
8 these things may be use as a factor for further  
9 decision.

10 Q. Like, how it changes over  
11 time?

12 A. Correct.

13 Q. And in addition to the  
14 other things that you were looking at that you  
15 described?

16 A. Correct. Because in  
17 terms of the testing itself there is also a need  
18 to recognize that each and every time we go out  
19 test the section we may be testing not exact same  
20 spot; we might be testing inch away from the  
21 previous time we test. So there is the  
22 expectation that even if you go back and test the  
23 following year there are certain variability  
24 because of the location you test now have changed  
25 a little bit and you have to applied statistical



1 filtering in order for you to come up with some  
2 conclusion on the data itself.

3 Q. Right. And so any  
4 particular result, as I understand it, because the  
5 locked-wheel tester is -- the brake is applied  
6 periodically every so often, whether it's a  
7 100 metres, 250 metres, whatever the distance is,  
8 and then the brake is applied for typically for  
9 four seconds, I understand, that you're not  
10 necessarily getting -- even if you're trying to,  
11 you're not necessarily getting the testing done on  
12 exactly the same spot?

13 A. Correct.

14 Q. And so you could end up,  
15 even though you are testing the same pavement,  
16 apart from changes to, you know, temperature  
17 changes and otherwise about weather and the time  
18 of the year and so forth, you have that potential  
19 variable as well?

20 A. Correct.

21 Q. And then you talked about  
22 FN65, that if it drops below 25 at FN65, I  
23 appreciate that that is the ASTM standard test  
24 speed?

25 A. Correct.

1 Q. But I also understand  
2 that the MTO typically tests at the posted speed,  
3 not at the ASTM speed?

4 A. Correct.

5 Q. So how do you make that  
6 decision --

7 A. So that's the reason why  
8 when we did the networks testing in 2013, we  
9 purposely test a lot of this location at posted  
10 speed, but we also tested at 65 kilometres an hour  
11 and actually try to develop the relationship of  
12 when you test it at 100 kilometre, when I want to  
13 normalize the result at 65 kilometres an hour what  
14 is the friction number at 65 kilometres an hour.

15 The reason for that is because  
16 a lot -- other than ASTM standard, a lot of  
17 research has been done in the States where the  
18 decision of when number below FN25 at  
19 65 kilometres an hour is when some agency analyze  
20 their data they notice that that is when there is  
21 increasing accident rate -- notice for increasing  
22 accident rate when the number goes below 25 tested  
23 at 65 kilometres an hour using the locked-wheel  
24 test method.

25 Q. And we will talk about

1 the 2013 network testing, but what's the  
2 difference that you use between -- arising out of  
3 that, what's the difference that you came to  
4 between FN65 and FN100?

5 A. There is an equation that  
6 we develop. It's a quadratic equation, you know,  
7 to the power to -- equation we come up with based  
8 on the testing, the number, things like that that  
9 we have. So there is equation that we now have  
10 for test speed of 100 kilometres an hour if we  
11 want to now project, normalize it back to FN65.  
12 And that basically some of -- for internal  
13 reporting that actually is standard that we report  
14 within pavement section because I have to use that  
15 number, because the scale that use to judge the  
16 FN30 is exactly based on the 65 kilometre ASTM  
17 research done at the state and between 30 to 25 is  
18 actually based on FN65.

19 So at posted speed there is  
20 none of those testing done to set those scale  
21 itself. So as a guide that is actually how we  
22 provide guidance to regional geotech, is to  
23 normalize it to a scale that basically have data  
24 to bracket research done at the U.S., like,  
25 CalTran and Florida (indiscernible) itself.

1 Q. Understood. So there's  
2 the equation, but if you have a number tested at  
3 100 how do you convert -- what is the  
4 conversion -- like, if you have FN40 what's the  
5 conversion? How much higher is it at FN65?

6 A. As I said, it is strictly  
7 based on calibration curve that we have developed  
8 and we have to be -- and we are actually still  
9 doing further work as we speak and everything to  
10 see is that calibration curve strictly good enough  
11 for all pavement type combined together in terms  
12 of all the different surface course that the  
13 ministry use, or do I actually even need to  
14 separate it whereby 12.5 FC2 is a different  
15 calibration correction, and if it is SMA is it a  
16 different correction, and if it is other mix type  
17 that we use, the predominant mix type that we use,  
18 should it be different correction. We do not have  
19 data yet.

20 We only have one whereby we  
21 combine everything together. So that is the one  
22 that we are using right now. The standard  
23 calibration equation that we have used is based on  
24 all combined surface type, but from where I'm  
25 sitting, we still need to do additional work and

1 likely more testing itself to see I do need to  
2 separate it for different mix type, because the  
3 texture of different mixes itself are different  
4 and I have a suspicion we may require different  
5 correlation equation if we use different mix type.

6 Q. And that's fair. And I  
7 understand completely, you're saying that it's  
8 aggregated at the moment, so to speak, but -- of  
9 all the mixed type, but what's the -- I mean does  
10 the differential change. I will just say if the  
11 difference 10 normally is that different at --  
12 depending on what the FN100 number is? Is the  
13 difference between FN100 and FN65, does it vary  
14 depending on what the actual obtained result is,  
15 or is it a constant resistant difference of, and  
16 I'll toss it out there --

17 A. It depend on the result  
18 of the FN you obtain at the posted speed. The  
19 correction will actually -- because the correction  
20 is, as I say, is to the power of 2 itself so in  
21 that sense it's not linear correction, it's  
22 actually a (garbled audio) correction.

23 Q. Okay. But do you know,  
24 for example, if you have an FN -- at FN100 if your  
25 result is 35, what is that at FN65? Do you know?

1                   A.    I wouldn't second guess  
2    it because, as I say, you will need to look at  
3    what is that number and the speed is and then  
4    (indiscernible) correction, and likely it's going  
5    to be at least 10 to 15, likely higher.

6                   Q.    The difference could be  
7    10 or 15 friction numbers?

8                   A.    Yes.

9                   Q.    So you're saying that an  
10   FN100 of 35 could be FN50 at --

11                  A.    -- 65, correct.

12                  Q.    Sorry, did you say 40 or  
13   45 or 50?

14                  A.    45 to 50 range would not  
15   be surprising.

16                  Q.    But you can't say for  
17   sure either; is that right?

18                  A.    I'm saying I would  
19   basically have to apply those equation that we  
20   developed to get that definite number for you.  
21   Given that we have done quite a lot of work to  
22   come up with that correlation we would need to use  
23   that equation.

24                  Q.    And when you're looking  
25   at the test results and you are interpreting the

1 test results that come in from -- when there's a  
2 request from a region, for example, and you  
3 describe your approach to it, is that -- is your  
4 approach something that you share with the  
5 regional, usually the geotechnical people?

6 A. For the regional, yes.

7 The reason is because we are actually supposed to  
8 provide assistance to them to ensure consistency  
9 of how they implement the specifications, standard  
10 and policy. So in that sense it is the MTO  
11 regional office that have the challenges, as  
12 pavement section we will provide them with  
13 technical assistance.

14 But if it is a DSM aggregate  
15 testing, the responsibility falls to soils and  
16 aggregates section to interpret the results  
17 because we then just basically provide the test  
18 services. The answer would be provided to the  
19 soils and aggregates section. They are one that  
20 will have to make the decision of what to provide  
21 in technical judgment.

22 Q. Right. Nonetheless, you  
23 would still consult with them on occasion in soils  
24 and aggregates about your views of the test  
25 results, or no?

1                   A.    Not -- if we are dealing  
2   with regional type basically it is in pavement  
3   section responsibility, but overall sometimes we  
4   do discuss with soils and aggregates because some  
5   of this issue cost both section itself and then we  
6   would try to see can we come to some consensus on  
7   some of the direction that we go with some of this  
8   internal policy.

9                   Q.    And when you're looking  
10  at results from the skid trailer is it the average  
11  FN -- I mean, we've seen the way the results are  
12  spat out, and it shows the average, the minimum,  
13  the maximum, and it shows the individual results.  
14  So is it the average or individual results or a  
15  combination of both?

16                  A.    It's actually average is  
17  because the ASTM standard and interpretation is  
18  actually based on the average.  So a lot of time  
19  we actually will look at the average.  But if we  
20  start to look at performance-based specification  
21  we then start to look at average but then we  
22  filtering on probably some statistical requirement  
23  to basically develop the performance-based  
24  specification.  So that's the only difference, is  
25  that if it is performance-based specification



1 there's a statistical component that overlay on  
2 top of the average friction trailer result.

3 Q. Just -- and we will talk  
4 about the performance-based specification, but  
5 you're talking about performance contracts that  
6 have warranties in them or minimum oversight  
7 contracts, those sorts of things, where there's an  
8 actual friction number specified in the contract  
9 that is to be maintained?

10 A. Correct.

11 Q. That's the context you're  
12 talking about. Okay. But if it's not that --

13 A. Then the average result  
14 generally is what we will look at. And as I say,  
15 the regional impact the discussion would be based  
16 on the average result rather than the high/low  
17 because ultimately one of the background filter  
18 that we do is that we want -- we will -- at the  
19 pavement section we will analyze all those result  
20 for that set of data. Is it normally distributed.  
21 If it is considered normally distributed we would  
22 consider that the result are within certain  
23 statistical inference, because ultimately you have  
24 to look at the result itself, it is statistically  
25 normal. If it is not, then there's a different

1 implication when you analyze the result.

2 Q. So there's a few things  
3 in there to unpack. One thing though is -- I  
4 appreciate you're not just looking at the minimum  
5 or the maximum. I get that. But I would have  
6 thought that as well you would be -- if individual  
7 results, for example, are strung together, if  
8 there's a -- regardless if the average is well  
9 over 30 or 40, for that matter would -- if you had  
10 a number of consecutive results, for example, that  
11 were concerning, whatever that number is, below  
12 30, well below 30, extremely below 30, that that  
13 could also be something that would get your  
14 attention?

15 A. As I say, we do a  
16 statistical analysis of all those data point and  
17 if the result falls onto a normal distribute --  
18 even if you have low numbers or a number of low  
19 number, it's still considered within the testing  
20 requirement of technologist (indiscernible) answer  
21 of the mean itself.

22 So then what it implies that  
23 means still apply. If the data failed what we  
24 called the normal distribution test based on when  
25 we analyze the data, we look at the kurtosis and

1 the skewness of data itself, if that test fail it  
2 implies your data is distinctly not normally  
3 distributed, then additional looking at the data  
4 is required to see if we need to separate the  
5 dataset itself.

6 But a lot of time when we look  
7 at it generally the data falls into a normal  
8 distribution, which means based on the testing  
9 variance, even the testing variance, the mean  
10 result is still representative of all those low  
11 result itself, because when do you testing  
12 sometime, as I say, there is certain variation.  
13 Basically some of it is due to the equipment,  
14 sometimes due to the location. And if you analyze  
15 the dataset is considered normally distributed it  
16 implies it is within the testing norm, that set of  
17 data is considered one family of curve. If it's  
18 one family of curve it implies the average result  
19 is representative of all this data.

20 So that is one analysis at the  
21 pavement site. We do it without even letting the  
22 region know, but we actually check for the normal  
23 distribution of those test dataset within the  
24 average result and if it pass that test it implies  
25 that average is representative.

1 Q. So if it passed that  
2 test, as you described it, do I understand you  
3 correctly as saying if you had three consecutive  
4 results at 25 that that is within the normal  
5 distribution, as you've called it, that you would,  
6 I don't know, discount those results and not have  
7 a concern about it? Do I understand that  
8 correctly?

9 A. The judgment will be  
10 based on the normal, the average result itself to  
11 come up with your position. As I say, depending  
12 on where the number fall (indiscernible) we look  
13 at the additional factors or not, unless, as I  
14 say, if FN65 normalize to FN65 it drops below the  
15 25 level, then I likely would recommend the region  
16 look at some immediate relatively short term  
17 remedial action to mitigate the challenges that  
18 you have.

19 Q. When did you start doing  
20 the normalization to FN65?

21 A. It's after we did the  
22 network testing program, because prior to that  
23 itself we do not look at data to do that jump (ph)  
24 itself and strictly it's based on looking at FN at  
25 whatever posted speed. That has been the policy

1 prior to my time, and that has continued until we  
2 actually have the network testing, because the  
3 network testing give us a much better feel of what  
4 is the friction number in the ministry network  
5 itself because without that, we could not even  
6 break down -- and even with the 2013 network  
7 testing there are gaps because in a certain  
8 pavement type if you only have field data point,  
9 the field data point may not be sufficient for you  
10 to make a very strong statistical inference of  
11 what is the answers. And those are one that we  
12 basically continue to program into our friction  
13 testing to get more of those in order for us to  
14 close some of the gaps.

15 Q. So the network testing in  
16 2013 itself, you started in your role as head of  
17 pavements and foundations October 1st, 2012, and  
18 then the testing of course happened in 2013. Was  
19 the network testing already in the works before  
20 you arrived or was that your initiative?

21 A. It's after I arrived.  
22 Because at that point --

23 Q. I mean after you arrived  
24 in the new role in October --

25 A. The network testing was

1 triggered by the requirement when I was asked by a  
2 steering committee to actually look at developing  
3 performance-based specification for the ministry,  
4 and one of the matrix that we were asked to pin  
5 down was friction number itself. We were asked to  
6 basically look at if we going into  
7 performance-based specification, other than all  
8 the cracking right (ph) and everything. One of  
9 the parameter we were asked to look at getting a  
10 criteria for is friction number, and that  
11 basically triggered my initiation of basically  
12 doing some network testing because we did not have  
13 the network friction number where we can actually  
14 try to use it as a criteria.

15 Q. Right. So if you're  
16 going to stipulate a number you need -- in  
17 contracts, the idea is you needed to have better  
18 data in order to understand what the appropriate  
19 number was; is that fair?

20 A. The (indiscernible) in  
21 developing the performance-based specification the  
22 ministry had make a commitment to the industry  
23 where we will set a certain -- we will actually  
24 set a performance-based specification at  
25 performance level of what is really in existence

1 based on the whole contract itself.

2                               So we are not going to set  
3 number that is above and beyond what the normal  
4 achievement of the value by the contractor because  
5 that implies some contractor will never meet it.  
6 So the contracting in this (indiscernible) want  
7 assurance on the ministry, if we are going to go  
8 to a radically new specification strictly based on  
9 performance where the industry don't have any of  
10 those data, that we are setting the standard  
11 whereby based on existing testing of the network  
12 or how they have constructed some of the highway  
13 itself, it is a value that basically still can  
14 achieved be the contracting industry.

15                               Q. Right. Sorry, at the  
16 outset of that answer you referred to a  
17 commitment. Was that a commitment to industry?  
18 To the industry?

19                               A. That was a commitment by  
20 our management to industry that we would set the  
21 performance metric to what is -- you know, based  
22 on what has been constructed before under the old  
23 type of specification.

24                               Q. And so then I understand  
25 that you directed Mr. Marciello to conduct network

1 testing in 2013; is that right?

2 A. Correct.

3 Q. How -- approximately how  
4 many were actually tested? I think there were  
5 194 identified highway sections.

6 A. 194 site was identified  
7 and probably a thousand something section itself  
8 has been tested. More than a thousand for sure.

9 Q. Sorry, in the 2013  
10 testing?

11 A. Correct, because the  
12 testing initially went through a summer and we  
13 start to analyze some of the result and then  
14 basically we notice that it's still not total set  
15 and we continue to test on to the onset of winter  
16 itself that year.

17 Q. Sorry, I just want to  
18 make sure we're talking about the same thing.  
19 When you say 194 sections were -- highway sections  
20 were identified and that I think you said more  
21 than a thousand were done. How did Mr. Marciello  
22 do more than a thousand sections?

23 A. We actually take the --  
24 if it is 194 section we can actually broke the  
25 bigger section into smaller section itself, or if



1 we do lane 1, then do lane 2 and lane 3, each lane  
2 actually has slightly different result because we  
3 actually try to book enough statistical point in  
4 order for us to analyze the different combination  
5 of factors itself because of mix type, speed, and  
6 all the different combination, like concrete  
7 pavement versus asphalt pavement.

8 So in that sense there's a  
9 huge number combination and if we just use only  
10 194 site but not break it down into different  
11 segment you would not have enough data points.

12 Q. So I think I understand  
13 you. You weren't saying that it started at 194  
14 and then it expanded by 5 times. You're saying  
15 149 were hived off into smaller --

16 A. Correct.

17 Q. If I can put it that way.

18 A. Correct.

19 Q. And if we could go to  
20 overview document 4, images 137 and 135, please --  
21 sorry, 137 and 138. I think I misspoke.

22 And these two pages -- and we  
23 have this thing that we call the overview document  
24 whereby various facts and documents are put into  
25 evidence. I'll take you to some of the actual

1 underlying documents as well, but if I'm taking  
2 you to the overview document and you want to look  
3 at the underlying document please let me know.

4 A. Okay.

5 Q. So in paragraph 327 it  
6 indicates, as we just discussed, that by  
7 March 2013 the MTO identified 194 sections to be  
8 tested using the MTO's up brake-force trailer, and  
9 there were initial concerns about the resources  
10 available to complete the network testing  
11 internally but then Mr. Marciello was assigned to  
12 complete it.

13 Is that fair, there was  
14 concern about whether he could complete it all?

15 A. Yes, there is, and  
16 because of this itself we actually did something,  
17 you know, we actually let him work overtime, which  
18 is something that we generally do not allow.

19 Q. Right. And there is --  
20 in paragraph 328, I'm not sure if that reference  
21 is entirely correct. Do you know when -- it  
22 refers to the completed network testing being  
23 completed in the summer of 2013, do you recall  
24 when it was completed?

25 A. I would think that is

1 actually near to onset of winter of 2013 rather  
2 than summer -- in summer Frank had completed some  
3 testing itself and we started the analysis  
4 process, but I don't believe that's the complete  
5 set of data.

6                   There was additional testing  
7 done after the summer itself where we get  
8 additional data to analyze the overall network  
9 data itself because, as I say, even as we speak  
10 right now, based on some of the gap identified we  
11 are still continuing to do additional testing.

12                   Q. Right. And if we look at  
13 paragraph 331, this is before the network testing  
14 took place. On January 11, 2013, Mr. Marciello  
15 e-mailed you attaching a presentation with graphs  
16 comparing historical pavement friction performance  
17 over time of SMA, dense friction course, HL1 and  
18 HL3 surface courses, and there's a comparison of  
19 the four.

20                   So this is -- before that the  
21 network testing.

22                   A. Correct.

23                   Q. Do you recall this?

24                   A. Yes, I do.

25                   Q. What does this show?

1                   A.    Well, it indicated the  
2    SMA friction number --

3                   Q.    Sorry, we can expand  
4    this.  It's a little bit blurry.  Sorry,  
5    apologize.

6                   A.    Based on this sampling  
7    itself would indicate SMA basically friction  
8    number tends to be comparable to HL3 which is  
9    something that basically I've commented itself  
10   whereby I think maybe the sampling size might be  
11   too small for SMA.  Because SMA at this point in  
12   time we already knew that SMA have initial  
13   frictional challenges, and when you test the SMA  
14   itself have a huge impact the FN number that  
15   you're going to report.  If you test the friction  
16   number of SMA very early in the SMA life you're  
17   going to get a low number compared if you test it,  
18   you know, one or two years out itself you will get  
19   a different number.

20                   So in that sense some have  
21   those things not totally known to me and some of  
22   this are still question that I still have.

23                   Q.    Right.  As I'm  
24   understanding this chart though, it's showing for  
25   all of the listed -- the four listed surface

1 courses, the FN -- friction numbers on the y-axis  
2 and then it's the age -- the age is on the x-axis.  
3 So it's showing over time what the FN is for the  
4 sections that are part of the sample, right?

5 A. Correct.

6 Q. And I appreciate we've  
7 heard a lot about the early age SMA load friction  
8 issue, but presumably that's not something that is  
9 applying for once you are past year one there?

10 A. Correct.

11 Q. Okay. Then go to  
12 images 181 and 182. And paragraph 434, which  
13 starts on the left-hand image and continues on the  
14 right, this is a full excerpt of notes from a  
15 meeting on December 16, 2013 indicating at the  
16 ORBA and OHMPA's request, on that date the MTO  
17 presented Mr. Brown, that's Sandy Brown of OHMPA,  
18 with friction data collected from 110 sections  
19 across the province from 400 series highways with  
20 various mix types including SP12.5, SP12.5 FC1 and  
21 FC2 and SMA. And Kevin English had notes from  
22 that meeting and that's what's referred to there.

23 And am I correct then this is  
24 after the completion of the network testing in  
25 2013; is that right?

1                   A.    This is substantially  
2    into the network testing already, correct.

3                   Q.    Well, it's December so  
4    you're not still doing the network testing at that  
5    point, I take it?

6                   A.    Because it takes time to  
7    process some of the data.  Because there is 110  
8    section I likely think that we have slightly more  
9    than 110 sections, so maybe a few additional  
10   section may or may not be included in yet.

11                  Q.    No, no, I was just  
12   distinguishing -- I understand that point.  I was  
13   just making sure I understood that the testing  
14   itself was done.

15                  A.    Yes, the testing likely  
16   has been completed, but have all the section been  
17   processed yet.  At this point when you represent  
18   110 section itself is something that I would think  
19   that maybe there is a few more section available.

20                  Q.    In the third paragraph  
21   there -- sorry, you were at this meeting?  You are  
22   listed on the attendees --

23                  A.    Correct.

24                  Q.    And do you recall the  
25   meeting?

1 A. I do.

2 Q. Okay. And just in this  
3 paragraph it indicates:

4 "The MTO has not determined if  
5 we will be going with one  
6 friction number for all the  
7 highways or friction numbers  
8 for different classification  
9 of highway types, i.e., one  
10 friction number for 400 series  
11 highways and one for two lane  
12 highways. MTO will wait until  
13 the analysis is complete  
14 before details are worked  
15 out." (As read)

16 And so do I understand this  
17 correctly that the contemplation was  
18 potentially -- the first part is one number which  
19 is the -- going to be the requirement in  
20 contracts -- in the performance contracts, one  
21 friction number, or to have differing friction  
22 number requirements in performance contracts  
23 depending on the classification of the highway; is  
24 that right?

25 A. Correct. Because until

1 we get the full data analysis of all the different  
2 highway classification and basically looked at the  
3 data itself, we may change our mind based on the  
4 data if we see a significant difference  
5 performance at 400 series highway versus two lane  
6 highway because the traffic volume on 400 series  
7 highway generally is much higher than some of the  
8 two-lane highway and basically the tire pavement  
9 interaction because of the higher volume, it may  
10 have different wear and tear and friction number  
11 generation might be different based on the  
12 different class of highway. We do not know at  
13 that point in time because those analysis were  
14 never done by the ministry before.

15 Q. So is that based on  
16 the -- would that difference -- that distinction  
17 be based on friction demand or on the --

18 A. It's based on the wear  
19 and tear, because if you had 400,000 ADT (ph) on  
20 your highway the amount of tear that mix get  
21 versus one that have 500 trucks -- 500 vehicle a  
22 day is going to be very different. And would that  
23 change the friction performance of highway because  
24 of strictly the sheer volume of vehicle, we were  
25 not -- we don't have those data is why we're



1 saying that we need to look at when we analyze  
2 those different highway and mix type and  
3 everything would we see a different trend.

4 Those are the things that we  
5 can't tell until we analyze the network data, and  
6 if we don't have those data likely we will have to  
7 augment and supplement and obtain those data  
8 before we make those decision.

9 Q. Okay. This is in  
10 relation to the performance contract issue, not in  
11 relation to the more generalized analysis of  
12 friction number; is that right?

13 A. Correct.

14 Q. You get a request from a  
15 region and so forth?

16 A. Correct.

17 Q. Okay. And there's a  
18 reference at the bottom and it goes on to the next  
19 page. MTO is currently not considering --  
20 actually sorry, take that down for a moment.  
21 Apologies. It's the paragraph above and that one  
22 as well where it starts "Sandy asked."

23 So this is again Sandy Brown  
24 from OHMPA indicating he's asking whether the MTO  
25 has considered other ways of collecting friction

1 data, and he talks about wondering if the friction  
2 trailer is the right tool considering the changes  
3 to motor vehicles, i.e., antilock brakes. And  
4 then he raises the issue of the grip tester, which  
5 is used for -- by Transport Canada and others for  
6 measuring runway friction. He raises cost issue  
7 and so forth.

8                                   And I take it -- first of all,  
9 he's raising here it's expensive to get a -- to  
10 buy a skid trailer. The grip tester is less  
11 expensive and if contractors need to purchase this  
12 in order to monitor friction under performance  
13 contracts the cost is a concern. Is that what  
14 he's raising here in part?

15                                   A. Yes, I think that's what  
16 he raised.

17                                   Q. And then it says MTO is  
18 currently not considering using a grip tester but  
19 is considering the ARAN to collect macro and  
20 microtexture measurements as another way to  
21 determine friction. So on the -- do you recall  
22 that discussion about the grip tester?

23                                   A. Yes, I do.

24                                   Q. And what was the basis  
25 for the -- if you recall, for the response of not

1 considering using a grip tester currently?

2 A. The reasons is because  
3 based on our research of the friction number and  
4 testing itself, the ARAN -- the skid tester that  
5 we used, and this is -- actually there's an ASTM  
6 standard, at that point time if you look at the  
7 grip tester there is no ASTM or ASHRAE (ph) test  
8 method that backs up the result from grip tester.

9 And based on a lot of research  
10 done to look at is the grip tester result, can it  
11 be correlated to the ASTM brake-force trailer, the  
12 answer is no, it's not. So if the result cannot  
13 be correlated to ASTM brake-force trailer, as a  
14 testing agency for ministry I prefer to test --  
15 use a test method that basically if anything is  
16 challenged it's actually based on an ASTM standard  
17 and there are certain guide of what those number  
18 is based on FN65 developed by state DOT itself.

19 So in that sense at least  
20 there's sufficient information of how to manage  
21 friction number. If you want to manage it there  
22 are already published standard and specification  
23 out there itself.

24 Whereas grip tester, as I say,  
25 at that point when we were researching it those

1 kind of documentation was not available to us and  
2 that's why our preference is to stick with the  
3 ASTM brake-force trailer. But we are also  
4 starting to use our ARAN equipment to look at  
5 macrotexture and supplement the ASTM FN number to  
6 actually generate what we call the IFI number  
7 itself. It's the international friction index.  
8 But that exercise -- the limited amount we do also  
9 proves to be a challenge.

10 Q. And presumably in  
11 addition what you described, given that the  
12 history, that MTO had a long history of testing  
13 using the locked-wheel tester, there would be --  
14 could be issues with continuity of data. The  
15 correlation problem, you would have a problem  
16 correlating data using a different device to reams  
17 of data that the MTO had historically; is that  
18 fair?

19 A. Correct.

20 Q. Go to images 151 and 152.  
21 Paragraphs 365 and 366 are referring to a slide  
22 deck from a meeting with the ORBA on March 4th,  
23 2014, titled "MTO network friction analysis,"  
24 which includes slides comparing friction numbers  
25 and age of the pavement compared by surface type,

1 including SMA, but the other surface types as  
2 well.

3 Do you recall -- we can go to  
4 it and I will go to it. Do you recall this  
5 meeting and the presentation?

6 A. Yes, I think -- yes, I  
7 think I do.

8 Q. All right. So if we  
9 could go to MTO 14811, please. Did you present  
10 it?

11 A. I believe I did.

12 Q. The e-mail referred to --  
13 indicates Stephen Lee presented the attached  
14 presentation to the group, so okay.

15 So it's titled "MTO Network  
16 Friction Analysis Presented to ORBA Hot Mix  
17 Committee March 2014." If we could go to the next  
18 image, and the one after that, page 3,  
19 introduction. It refers in the third sentence to  
20 in 2013 friction testing was expanded to include  
21 over 150 pavement sections as part of a network  
22 level study. So that's what we were just talking  
23 about, the network testing in 2013?

24 A. Correct.

25 Q. Okay. And as you have

1 indicated, conducted the testing at 65 and  
2 100 kilometres per hour. And then there's other  
3 things that you talked about about the  
4 macrotexture data and the assessed friction number  
5 and IFI as pavement performance parameters. And  
6 then the third bullet says:

7 "Conduct a rudimentary  
8 analysis of friction results  
9 based on pavement types,  
10 pavement age, mix types and  
11 traffic level." (As read)

12 I will take you to some of  
13 those slides, but when you say rudimentary, just  
14 referring to this is all very preliminary, and so  
15 forth. What are you getting at there?

16 A. Yeah, I guess because  
17 this first time we analyze it, and I'm not sure  
18 whether the dataset is as complete as we want. So  
19 in that sense I'm saying it is not -- it's not  
20 likely going to be the complete set because based  
21 on any of the gap itself, we know we were actually  
22 committed to go back and do more data collection  
23 as required, if we see gaps.

24 Q. And then the next image,  
25 data analysis. I think you've described to some

1 extent that your -- that first bullet, that it  
2 represents a cross section of flexible and rigid  
3 pavements. So on the flexible side of things I  
4 think I understand those are asphalt pavements,  
5 but the rigid payment, is that concrete pavements  
6 as well?

7 A. Correct.

8 Q. And then the pavement age  
9 based on MTO contract records, so you're looking  
10 back at again so what's the age of each particular  
11 section that you're testing because you're looking  
12 at it over time, right?

13 A. Correct.

14 Q. Next image, 5, I think.  
15 And this slide it titled "FN versus age - all  
16 surface type." And it's not in colour here  
17 unfortunately, but on the y-axis we've got the  
18 friction number and then the pavement age on the  
19 x-axis. I can see that. And I also see though  
20 that some of these types -- each line or symbol is  
21 one of the pavement types listed on the right-hand  
22 side, correct?

23 A. Correct.

24 Q. And some of them are just  
25 one point in -- one age in time. Like I see for

1 HL1 is the top one listed. It's got a square and  
2 then it has one square at eight years. Does that  
3 mean that there was just one HL1 sample?

4 A. Correct. And I guess one  
5 of the thing that you take away from this is that  
6 we actually combine pavements segment with the  
7 different age but not monitored to what I call  
8 time series monitoring, which is a much more  
9 accurate way of monitoring a pavement section.

10 I'm saying if the HL1, some of  
11 the segment that was done five years ago, six  
12 years ago, seven years ago, eight years ago, but  
13 these are radically different pavement segment,  
14 although the same surface type. I did not  
15 actually plot the performance of that one segment  
16 at year 5, 6, 7, 8. That would be what I call a  
17 more accurate time series kind a projection.

18 When we actually plot  
19 pavement -- same pavement type with different year  
20 under as if it's performing at the same year you  
21 will get some radically wiggling of the data. The  
22 reason is because it's different pavement segment  
23 which have a little bit of a different workmanship  
24 and material that was put on, although it's  
25 classified as FC2, but technically it could be



1 slightly different.

2 So that's the reason why that  
3 introduce a range of variability into this  
4 analysis with age when you don't do a proper time  
5 series tracking of the project itself.

6 Q. So if I understand it  
7 correctly, the bottom zigzag that starts at five  
8 years and goes up and then down and then up again,  
9 that's the SMA line, right?

10 A. That's the SMA line with  
11 different SMA project composting (ph) to give you  
12 that result for that year. Because when we look  
13 at data 2013, some of the SMA is five years, some  
14 are six, some seven, some eight, but it's the same  
15 SMA section that we track over time.

16 Q. And it's the same for the  
17 other ones as well -- it's the same for the other  
18 ones as well. It's a snapshot in time of  
19 different pavements?

20 A. Correct.

21 Q. Actually if we could go  
22 to image 13, Registrar. I believe it's 13. It's  
23 an appendix.

24 And I think, if I've  
25 understood it correctly, here it's showing what we

1 were just looking at in the graphic form which it  
2 actually shows the number of pavements at each age  
3 for each type of surface course; is that right?

4 A. Correct.

5 Q. And on the HL1 example  
6 that I gave on the far left there's the one sample  
7 at eight years with an average FN of 43.8?

8 A. Correct.

9 Q. And then on the SMA  
10 example, which is right in the middle there,  
11 there's the pavements at five, six, seven and  
12 eight years, and -- but it's two pavements at five  
13 years, you can see on the bottom part of the  
14 chart, one at six years, two at seven years, two  
15 at eight years. That's what has been represented  
16 graphically in what we were just looking at,  
17 right?

18 A. Correct.

19 Q. And again -- and so if  
20 two pavements are involved the number in the top  
21 part of that chart, for example, five years out  
22 for SMA, the 43.4 FN, that's the average of those  
23 two pavements?

24 A. Correct.

25 Q. Okay. And for SP12.5 at

1 three years the average FN of 57 is -- there's  
2 nine pavements that that's the average of?

3 A. Correct.

4 Q. So the sample sizes being  
5 quite different depending on pavement and the  
6 year?

7 A. Correct. I guess 12.5 is  
8 actually quite common. And we are trying to seek  
9 and we actually try to -- first of all, the  
10 network selection is what we call randomized  
11 selection of the segment because we do not want to  
12 have bias in the result. But somehow we also want  
13 to see based on the different spread of the mix  
14 type itself if we captured something that  
15 represent roughly the ministry and likely not  
16 totally, and that's probably what will trigger the  
17 next round of testing that we will likely have to  
18 conduct to select random sample that will  
19 represent the ministry -- amount of different  
20 surface type that the ministry have on -- out  
21 there on the highway so that it will represent  
22 better than what was done in the 2013.

23 Q. And when you talk about  
24 network testing being a randomized selection so as  
25 not to have bias in the results, am I correct what

1 you're talking about there is when you're taking  
2 requests for testing by the regions there's a bias  
3 in there, I don't mean that negatively, but  
4 there's a bias towards pavements that have low  
5 friction because the region has identified some  
6 potential reason for requesting the testing in the  
7 first place?

8 A. Correct, because if we  
9 start to include those analysis likely the FN  
10 number of those -- that network itself will likely  
11 be having a lower FN number because it is really a  
12 suspected low friction or complain that basically  
13 some people itself [indiscernible] that they might  
14 be having challenge with friction and then we only  
15 test those. So there's expectation, those result  
16 will bias toward the low side.

17 It's the reason why at the  
18 network level testing be decided to randomly  
19 select. We put the number of 400 series King  
20 Highway and everything as potential candidate and  
21 randomly select those itself and randomly select  
22 some of the section itself out to do the testing  
23 is that there is no conscious bias to selecting  
24 the section.

25 Q. And if we could go to

1 image 10, please. Maybe 9. This is titled  
2 friction number and test speed, and the friction  
3 speed correlation?

4 A. Correct.

5 Q. This is the equation you  
6 were talking about?

7 A. Correct. This is the  
8 equation we developed based on the test data. You  
9 know, the R spread (ph) of 0.8 is considered quite  
10 highly calibrated, so because of that we are  
11 saying if you have tested it at FN100 I can  
12 actually based on the result FN100, then translate  
13 it back to what is it equal to in FN65, then look  
14 at some of the guideline of how we would look at  
15 monitoring and determination itself if the number  
16 require it.

17 So in this graph itself, if  
18 you are basically at FN140, you go to the graph,  
19 you go down, then at FN65 is probably at around  
20 45.

21 Q. So following the same  
22 thing, if you're at FN100 on the y-axis at 30 it's  
23 around 35, and --

24 A. Correct.

25 Q. Is that right? If I'm

1 reading that correctly?

2 A. Correct.

3 Q. Okay. And FN25 looks to  
4 be a little over 30; is that right?

5 A. Correct.

6 Q. I'm glad my sight is  
7 working. Okay. And that's based on the results  
8 from this 2013 testing?

9 A. Correct.

10 Q. Okay. And on the graphs  
11 before that we were looking at that show the  
12 year-over-year averages for pavements, was that --  
13 were those numbers at FN100 or FN65 or a  
14 combination, if you recall?

15 A. The majority of it would  
16 be FN100, because most of the highway the ministry  
17 has posted at 100 speed, and generally that one  
18 is -- if we analyze it at different speed we would  
19 have separated out because we know that we need to  
20 do a correction to basically pop FN number as  
21 equivalent.

22 Q. So I get that. But when  
23 they're represented -- maybe if we could go back  
24 to image 13, please, Registrar.

25 So it shows the average

1 number, but what I'm wondering is that for each of  
2 these is it taking the raw number, whether it's --  
3 and then the average, whether it's at FN65 or  
4 FN100, and average --

5 A. It would be FN100.

6 Majority of the highway that we tested are  
7 actually FN100, posted speed of 100, because for  
8 the safety of the staff itself they need to test  
9 it as the posted speed.

10 Q. Right. And the 400  
11 series --

12 A. [Indiscernible]  
13 everything itself.

14 (Speaker overlap)

15 Q. Right. And for the  
16 400 series highways that's the posted speed?

17 A. Yeah.

18 Q. Okay. So the SMA results  
19 there, for example, those are the results at --  
20 because they are only used on 400 series  
21 highways -- those are all at FN100?

22 A. Correct.

23 Q. Okay. And probably the  
24 same for the SP12.5, FC1 and FC2?

25 A. Correct.

1 Q. Are the ones at 65, are  
2 they more likely the ones like the, I'm not sure,  
3 HL4?

4 A. HL1 and HL4 likely a mix  
5 that we no longer use but municipality use.

6 Q. I see. You weren't  
7 testing on municipal sites at the time?

8 A. No, we are not, but we  
9 still have some remnant old highway that we may  
10 have some of the Omix site.

11 Q. But would those be the  
12 lower speed testing or no?

13 A. Some of them would be  
14 probably 90.

15 Q. Okay. But I thought --  
16 this is the network testing though so I thought  
17 the network testing is either done at 100 or 65?

18 A. Yeah. Then the answer is  
19 that for the lower volume will be tested at 100  
20 and we -- because we're using it to calibrate back  
21 to 65. Ultimately, like, continuing on with the  
22 program itself, some of the highway we are testing  
23 now at 90 or 80, depending on what posted speed,  
24 and also testing at 65 to come up with a different  
25 combination for those arterial and local highway.



1 Q. No, I get that. But in  
2 terms of the network testing --

3 A. The initial (skipped  
4 audio) tested at 100 kilometre or 65 because  
5 that's the intent of trying to find a correlation  
6 between 100 and 65.

7 Q. Absolutely, I get that.  
8 I'm just wondering which ones were at 65.

9 A. And I can't tell you, but  
10 the frame (ph) was instructed to test as many as  
11 possible so that we could get statistically  
12 significant number. If you look at the plot of  
13 the FN65 versus 100 there likely is probably more  
14 than 100-something section that have done testing  
15 of both speed.

16 Q. Sorry, at which speed?  
17 At both?

18 A. At both speed. Because  
19 in order for us to plot it on the 65, 100  
20 kilometre graph you have to test it at both speed  
21 in order for it to be represented.

22 Q. Yeah. At both speeds,  
23 yes, okay.

24 And then if we go to image 11,  
25 "Preliminary Findings." I think you've largely

1 discussed these already but, unsurprisingly,  
2 higher friction values achieved for tests at 65  
3 kilometres an hour compared to 100 kilometres an  
4 hour. And then at the top bullet, data suggests  
5 that friction remains fairly constant or decreases  
6 very minimally over time. What's that based on?  
7 We looked at the chart and you described the  
8 limitations in the data but --

9                   A. Overall indication and  
10 based on our previous experience with FN number of  
11 a lot of those DSM aggregate, it is consistent  
12 with the decrease of friction occurs initially but  
13 tends to stabilize after three years. So it's  
14 like quite a common phenomenon and some of the  
15 data on the graph itself also case relatively same  
16 kind a trend.

17                   Q. And then as you said at  
18 the outset of this, the ultimate main purpose of  
19 the network testing was in relation to the issue  
20 of performance contracts, and we know -- and we'll  
21 get to this, that ultimately the MTO decided not  
22 to jettison the front end of DSM approach in  
23 favour of entirely going to performance-based  
24 contracts, but where did you yourself eventually  
25 come down on this issue about performance --

1                   A.    I'm actually in favour of  
2    DSM because from where -- from my perspective  
3    itself, DSM test the initial property of the  
4    aggregate performance during a series of lab  
5    testing in polished stone value. After that in  
6    order for you to correlate for DSM you actually  
7    have to place a real test segment with real mix  
8    design onto a 500-metre segment of roadway or  
9    highway, and we tested that over time to ensure  
10   that the performance is there for long term  
11   duration.

12                   The real shortfall of the  
13   friction number at the specification end of the FN  
14   number is that if today I tested FN number is  
15   at 30, next day if I tested it as 24, are you --  
16   then you have basically specified the  
17   specification that works for one year rather than  
18   the whole duration of the design of the pavement  
19   itself.

20                   And that is one of the  
21   discussion I had with our task (ph) group itself  
22   is that how do we properly set a friction number  
23   so that as a designer I actually expect the  
24   performance of the friction number to be as good  
25   up to the end of my design life of the pavement,

1 not three years due to the warranty specification  
2 or seven years.

3 At seven years is reach the  
4 end of the life of the friction number implies I  
5 need to rehab that pavement at year 7, which means  
6 although I design pavement for 20 years, but the  
7 lifecycle of the pavement is only seven year --  
8 three year, because if you to have construct the  
9 pavement with very high friction or not, chances  
10 are if you specify a very low friction number  
11 you're going to get a contract that is slightly  
12 above that and not much more higher than that  
13 because that implies -- there's a cost implication  
14 to having to provide better material.

15 So in that sense I think that  
16 is still not totally set in quite a lot of agency  
17 that look at performance-based specification how  
18 to specify a number that is acceptable at  
19 construction but also acceptable to ensure there  
20 is significant performance during the whole design  
21 life of the pavement itself.

22 So that is still -- I think  
23 the verdict is still out on that in the industry  
24 and the agency. So in lieu of that I think the  
25 DSM actually provide concrete assurance of after

1 immediate construction having the performance and  
2 also long term performance because the real  
3 material is actually monitored over time and you  
4 would not put it on your DSM if you find that the  
5 material is not suitable in term of performance  
6 with long term -- short and long term performance  
7 being taken care of.

8 Q. And if we go to overview  
9 document 4, Registrar, image 186.

10 And in paragraph 446 it's  
11 referring to November 14th -- thank you, you can  
12 expand that -- 2014 presentation with some  
13 recommendations at the time which are still  
14 pertaining to if you're going to have performance  
15 specifications.

16 And your recommendations there  
17 are based on the conversion to FN65 and then  
18 there's a recommendation as to the expected  
19 friction number. Am I correct that this is again  
20 aimed at the performance specifications if you are  
21 going to put in the numbers in the contract?

22 A. Well, this is because we  
23 were directed to look at friction number in  
24 performance-based specification because I guess  
25 the -- when actually given the request to see if

1 there's a choice of looking at different way to  
2 look at performance, the final recommendation to  
3 the steering committee and everything itself is to  
4 actually revert back to the DSM aggregate and  
5 ultimately that is what is being implemented at  
6 the ministry, and moving forward now we're still  
7 in DSM aggregate mode of selecting mix itself to  
8 ensure performance in the ministry, and for  
9 concrete we modify it whereby insoluble residue  
10 (indiscernible) in place to ensure long term  
11 performance of concrete pavement specification  
12 itself.

13 So that actually -- this is if  
14 you ask me to strictly use friction number, this  
15 would be our first iteration of what we think we  
16 want to put out. Likely we'll be pushed back from  
17 the industry. We expect that they will push a  
18 number further lower. So in some sense this is  
19 the first situation of what number if you ask me  
20 to put it out, if it's strictly based on FN65,  
21 this would be the recommended --

22 Q. So I -- sorry, go ahead.  
23 I'll catch up. This would be their --

24 A. Because ultimately we  
25 know that the industry is used to seeing FN30 at

1 posted speed at the ministry contract. But if  
2 they start to look at the graph of the FN100  
3 versus 65, very fast they'll conclude if we want  
4 it at certain value itself, we actually, FN65, 40  
5 is acceptable, would translate to a certain number  
6 at FN100.

7 Q. Right. No, I got it.  
8 And so to be clear, this is -- and I understood  
9 what you said before about what your view was  
10 about sticking with the DSM, and you're saying,  
11 but, you know, we directed to look at this. But  
12 this is -- if I'm correct, this is, again, about  
13 the inclusion in performance contracts, right? If  
14 that's right.

15 A. Firstly, in performance  
16 contract inclusion and in performance contract in  
17 lieu of. Basically if you are asked to remove DSM  
18 requirement in the specification.

19 Q. Okay. And if I can sort  
20 of interpret what you were saying was you knew  
21 there was going to be push back, so you were sort  
22 of going in high. Is that -- with the  
23 recommendation is that the --

24 A. Going in at a number that  
25 we think is what is appropriate is likely we'll

1 see some push back.

2 Q. Okay. And from looking  
3 at the -- we're just in 2014 here, late 2014, and  
4 we looked at the numbers in your presentation  
5 before about the results at FN100 versus FN65, and  
6 so a 40 of FN65 at that point anyway, as I  
7 understood that chart that we discussed, would be  
8 about 35 at FN100 from -- based on the results  
9 that you at that point; is that right?

10 A. Correct.

11 Q. Okay. And if we could go  
12 to image 186 -- oh, we're at 186. I guess 186 and  
13 187 in paragraph 448 which straddles the two  
14 pages.

15 So this is on November 25th,  
16 2014. There's a geotechnical committee meeting at  
17 which you presented on the status of performance  
18 specification, and there's a couple of redactions  
19 for privilege, so I'm not asking you to talk about  
20 legal advice or anything of that sort.

21 And there's -- we will get to  
22 a subsequent meeting, but there's a recommendation  
23 to continue with current friction management plan.  
24 So is that referring to sticking with the DSM?

25 A. Correct.



1 Q. Okay. And then:  
2 "GeoCon -- redaction for  
3 privilege -- do not recommend  
4 publishing a friction number."  
5 (As read)

6 So that -- am I understanding  
7 it correctly then it's saying that okay, if we're  
8 not going with the performance specifications,  
9 we're going with the DSM; the recommendation from  
10 GeoCon is that there's -- that the MTO is not  
11 going to publish a -- what constitutes a  
12 acceptable friction number; is that right?

13 A. Correct.

14 Q. And if we could go to  
15 image 453 -- paragraph 453. I apologize,  
16 image 188, yeah. Thank you.

17 And just to close out the  
18 issue of the performance specifications, this is a  
19 reference to a May 13th, 2015 meeting which the  
20 ORBA which you were apparently at. Do you recall  
21 this meeting?

22 A. Correct.

23 Q. And then it just -- it's  
24 a very short entry there on the annotated agenda  
25 which refers to:

1 "Performance specification  
2 skid number, Stephen Lee."  
3 And it refers to a May 1st,  
4 2015 MTO meeting, and then it says:

5 "MTO developed friction number  
6 to use in performance  
7 specification. Decision is to  
8 revert back to the DSM list.

9 "Item closed."

10 So is this when this is  
11 announced, I guess, to the industry?

12 A. Correct.

13 Q. Okay. That the MTO is  
14 sticking with the DSM and not moving broadly based  
15 to a performance-based friction number  
16 specification?

17 A. We are going through the  
18 performance-based specification, but there will be  
19 material requirement of the DSM list, which some  
20 people wants to get rid of material requirement  
21 and all those thing itself. But we're saying for  
22 frictional performance itself, the DSM is still  
23 the better way which means it's a material spec.  
24 You have to qualify you material through the  
25 process in order to even to be used in

1 performance-based specification. But a lot of the  
2 other performance itself have ran strictly to a  
3 performance base but not the friction.

4 Friction --

5 (Speaker overlap)

6 A. -- back to the DSM.

7 Q. Sorry. Yeah. Good

8 clarification.

9 There are still performance  
10 contracts. It's just that typically they are not  
11 done with friction number as one of those  
12 performance requirements, yeah.

13 A. Yeah. It's done with the  
14 material requirement of the DSM list.

15 Q. Right. Okay. Thank you.

16 Okay. So I would like to move  
17 on to a different area now which is -- if we could  
18 go to image 159. It's a couple of municipal  
19 requests for testing. And paragraphs 389 and 390.

20 This deals with a request from  
21 the region of York in -- on July 24th, 2013.  
22 Someone e-mails you on behalf of Vimy Henderson at  
23 Golder requesting:

24 "A small amount of friction  
25 testing required in the Region

1 of York as was discussed last  
2 week."

3 And you forwarded this on to  
4 Mr. Marciello to coordinate the testing with  
5 Golder for the region of York just regarding an  
6 intersection. Mr. Marciello replied on July 26th,  
7 2013 that, "normally municipal requests are  
8 considered a last priority," but that he may be  
9 able to accommodate the request. And there's a  
10 discussion about whether there was an issue with  
11 accidents and said he believes that's why it was  
12 required.

13 And then at paragraph 391,  
14 next image, Mr. Marciello, he did conduct -- he  
15 conducted the testing and e-mailed the results to  
16 Golder. Dr. Henderson and Ms. Kennedy from Golder  
17 on August 1st, and he reported on those numbers.

18 So first of all, we briefly  
19 talked about municipal requests when I was asking  
20 you about the kind of requests that come in, and  
21 is Mr. Marciello correct that normally municipal  
22 requests are considered a last priority, but they  
23 be -- if they can be fit in, they would be; is  
24 that fair?

25 A. Correct.

1 Q. And then if we could go  
2 to, Registrar, it's a overview document, later in  
3 time and mostly dealing with different issues.  
4 It's overview document 6, and it's image 61 and 62  
5 and paragraph 156.

6 I'm going to go to the  
7 document itself. I just want to place it in time.  
8 October 4th, 2013. So it's a few months later.  
9 Again, it's Vimy Henderson at Golder writes to you  
10 to ask if they can discuss the City of Hamilton's  
11 request for some friction testing, and then you  
12 respond on October 7th asking for more details  
13 about the scope and the timing to see if it could  
14 be accommodated.

15 And if we could go to  
16 Golder 4467 and image 2. Do you recall this --  
17 these communications?

18 A. Yes, I do recall some of  
19 this.

20 Q. Okay. And so there's the  
21 October 4th e-mail from Vimy Henderson of Golder,  
22 and she says:

23 "Hi Steven, our client the  
24 City of Hamilton wishes to  
25 have some friction testing

1 carried out. Are you  
2 available to discuss this the  
3 beginning of next week?" (As  
4 read)

5 And then, as I said, you wrote  
6 back is the -- what I already referred to on  
7 October 7th. It's the bottom of --

8 "Dear Vimy, let us know the  
9 scope and timing to see if we  
10 can accommodate this request."  
11 (As read)

12 And sorry, did you know  
13 Dr. Henderson at the time?

14 A. I did know of her from  
15 previous dealing with her itself when our section  
16 actually procure some noise testing that Golder  
17 completed for us through her.

18 Q. Okay. So you had dealt  
19 with her professionally before? Before these  
20 e-mails?

21 A. Correct.

22 Q. Okay. Okay. And then if  
23 we go to image 1, there's actually a sticky note  
24 over part of the text. So I think we'll go to the  
25 overview document which quotes these two e-mails

1 without a sticky note. So it's at overview  
2 document 6, image 70. Oh, yeah, 70 and 71. It's  
3 at paragraph 179.

4 So this is just the  
5 continuation of the chain we were looking at on  
6 October 29th, 2013. Dr. Henderson and Mr. Lee  
7 exchange further messages, and then why don't we  
8 look at those.

9 If you could expand the top  
10 there. So this is a complete excerpt from those  
11 e-mails but without sticky note.

12 So Ms. Henderson writes to you  
13 and gives the details on October 29th. There's a  
14 gap in time between your last e-mail and this one  
15 from her that they're looking to have the testing  
16 done as soon as possible.

17 "City of Hamilton is looking  
18 to have the testing done as  
19 soon as possible and they  
20 would like the Red Hill Valley  
21 Parkway, RHVP, and the Lincoln  
22 Alexander Parkway tested. The  
23 RHVP continues into the LINC."  
24 I think that means the Lincoln  
25 Alexander Parkway. "There are

1 two lanes in each direction,  
2 each lane is 18 kilometres in  
3 length. They will likely also  
4 ask for a few ramps to be  
5 tested. They have couple new  
6 crosswalks in the City that  
7 they would like tested as  
8 well. Is this something you  
9 would undertake or should they  
10 look at hiring a firm to do  
11 this given the amount of the  
12 testing? If they are alright  
13 with just having a few random  
14 locations tested on the RHVP  
15 and LINC as well as ramps a  
16 couple of random ramps and  
17 crosswalks, would this be  
18 feasible to do? If you did do  
19 the testing on the RHVP and  
20 LINC, would you need traffic  
21 control." (As read)  
22 And then you write back on the  
23 same day:  
24 "We're behind in our friction  
25 network level work and



1 performance-based testing  
2 specification testing  
3 recommend you get quotation  
4 from ARA that has the same  
5 equipment or others that have  
6 different friction equipment.  
7 Sorry, we will not be able to  
8 accommodate this for this  
9 season. Some friction testing  
10 machines are sensitive to --"  
11 Says "ambient slash pavement  
12 surface temperature." It's actually in the  
13 original. It's a slash, not the word slash. I  
14 think that's a dictation error.

15 And so having looked at this,  
16 do you recall if that -- at the time of these  
17 e-mails were you aware that the MTO had previously  
18 conducted skid testing on the Red Hill Valley  
19 Parkway?

20 A. I think at this point in  
21 time it sound like we not, and I guess based on  
22 the scope that was indicated in the e-mail itself  
23 and as indicated in my response, we were in very  
24 tight timeframe to likely come up with the  
25 performance-based specification. In fact, right

1 after we complete the testing itself, we were  
2 asked to terminate writing concrete pavement  
3 performance specification and just wrap up the  
4 asphalt performance-based specification.

5 So at this point in time we  
6 were under very tight timeframe order from the  
7 steering committee to wrap up the work on asphalt  
8 performance-based specification. And I know to  
9 complete the work itself, we were run the tests  
10 until almost onset of winter itself before we get  
11 sufficient data for us to analyze the 2013 network  
12 testing for them. So I think we are pushing it  
13 right to the limit, and Frank was incurring a lot  
14 of over time which, you know, start to be a  
15 concern at management that we are actually  
16 allowing staff to run overtime when a lot of the  
17 other staff are not about to have any overtime.

18 Q. Okay. So there's a few  
19 things in there. I think that the second part of  
20 what you were talking about was Frank Marciello  
21 being engaged in the network testing, and so he  
22 was busy, and so that is the reason for the  
23 unavail- -- for the refusal, right?

24 A. Correct.

25 Q. Okay.

1 A. Correct.

2 Q. And then the first part  
3 and my specific question was about whether  
4 you had -- at that point in time whether you were  
5 aware that Mr. Marciello had previously conducted  
6 the friction testing on the Red Hill. And I  
7 believe your answer was that you don't think that  
8 you did at that time; is that right?

9 A. Correct.

10 Q. And did you know anything  
11 about the Red Hill Valley Parkway at that point in  
12 time?

13 A. The only thing I know  
14 about is that at 2008 CTAA I actually read a  
15 document itself that was published by Ludomir  
16 about using perpetual pavement on Red Hill Valley  
17 of SMA. Because I was the SMA task group, that  
18 exactly put my interest in the use of SMA on Red  
19 Hill Valley Parkway, but it was strictly the use  
20 as a perpetual pavement itself.

21 Q. Right. So you were --  
22 you were on the SMA task group at some point; is  
23 that right?

24 A. Correct.

25 Q. Yeah. Okay. And in that

1 context you had an interest in SMA, and you had  
2 read that paper?

3 A. Correct.

4 Q. Okay. It was before you  
5 were working at MTO, so I'm assuming at that point  
6 you -- the 2008 paper you're talking about. So  
7 it's not that you went to the CTAA conference.  
8 You just -- I assume.

9 A. Correct.

10 Q. Right. You just read it  
11 as part of your inquiries in relation to SMA. And  
12 there were -- okay. So you were aware that it had  
13 an SMA surface course and a perpetual pavement,  
14 but are you -- that's the -- what was in that  
15 article or that paper was the extent of your  
16 knowledge of it at that point?

17 A. Correct.

18 Q. Okay. And in terms of  
19 whether you were aware of the prior testing on the  
20 Red Hill by Mr. Marciello at the point of this  
21 e-mail exchange, you say you don't think you  
22 did --

23 A. I don't think I did at  
24 this point in time. Probably at the later part  
25 when I think an e-mail was forwarded to me from

1 Frank, when they sent it to Bob and to Steve  
2 Senior, likely is the first time I see it as a DSM  
3 aggregate testing.

4 Q. Okay. So you're  
5 talking -- and we'll get to that in a moment.  
6 You're talking about when the results from  
7 Mr. Marciello's testing in July 2014, when he sent  
8 those results to you and the soils and aggregates  
9 people, you think that that's the first time that  
10 you were aware of the prior testing?

11 A. Of the testing for DSM.

12 Q. Right. Well, okay, of  
13 the testing for DSM, yes, but for any purpose.  
14 I'm just asking if you were aware -- is that the  
15 first time you were aware of the testing being  
16 done on the Red Hill for any purpose?

17 A. Correct.

18 Q. Okay. And from your  
19 answer, when you say -- I just want to be clear on  
20 your level of certainty. You believe that's the  
21 case, but are you certain or -- about the timing  
22 of that, or is that you believe most likely that's  
23 the context --

24 A. Most likely.

25 Q. Okay. All right. Now,

1 do you know if and when you discussed with  
2 Mr. Marciello the request from Dr. Henderson of  
3 Golder to test the Red Hill Valley Parkway and the  
4 Lincoln Alexander Parkway?

5 A. I don't think discussed  
6 with him because at that point in time I really  
7 knew that we are much behind in our friction  
8 testing for the performance-based specification,  
9 so in that sense I would have made that decision  
10 without consulting him at all given that  
11 ultimately it will impact delivery of the result  
12 for us to make the performance-based specification  
13 foundation and move forward with the specification  
14 itself.

15 Q. Okay. So you don't  
16 believe that you spoke to him prior to making the  
17 decision and sending this e-mail on October 29th?

18 A. Yeah, I'm quite certain I  
19 would not have consulted him.

20 Q. Okay. And what about  
21 subsequently? Did you discuss the request with  
22 him after making the decision and communicating it  
23 to Golder?

24 A. I don't recall that we  
25 have further conversation this after we have

1 rejected it.

2 Q. Okay. You don't recall  
3 one way or the other?

4 A. Correct.

5 Q. And I could tell you that  
6 Mr. Marciello testified on Tuesday, and he did  
7 recall that he had a conversation with you about  
8 Golder's request, and he remembers -- he said he  
9 remembers that you telling him that there was no  
10 time for the work because of the network testing.  
11 And he wasn't able to recall when it happened,  
12 except he did think it was at some point after  
13 your communications with Golder on this.

14 A. It would likely have to  
15 be sometime after because I know in making the  
16 decision I really knew that we are behind, so I  
17 would not commit to any additional testing for  
18 anyone even --

19 Q. Okay.

20 A. -- given that -- you  
21 know, even meet our own target.

22 Q. Okay. I understand your  
23 explanation about why you declined to conduct the  
24 testing here. Of course, we've seen that back in  
25 July, I think it was, of 2013 you did authorize

1 Mr. Marciello to conduct the testing in York  
2 region. Do you recall why the different approach?

3 A. At that point in time  
4 if -- when I probably did consult with  
5 Mr. Marciello about his progress of the friction  
6 testing, and if we have a lull in between, then  
7 basically we would accommodate if we can.  
8 Municipal request is basically one of the last few  
9 item that we will consider in our priority. If we  
10 can accommodate, we will. But if there is any  
11 ministry work that requires testing, regional  
12 testing, then that thing would trump municipal  
13 request. And basically because we have a very  
14 tight frame for performance-based specification  
15 testing that for 2013 is number one target of  
16 performance to get me sufficient information in  
17 order for us to develop performance-based  
18 specification. So in that sense, his priority is  
19 to do network level testing so that we get  
20 sufficient data to actually develop the  
21 performance-based specification where we were  
22 actually tasked to complete. It's under basically  
23 the ministry AG report; it all come out of the AG  
24 report itself.

25 Q. Okay, okay. If we could



1 go back to overview document 4 and image 96, and  
2 in paragraphs 229 and 230. This is the testing in  
3 2014 on the Red Hill that we were discussing.

4 And if you could expand 229  
5 and 230.

6 So the testing takes place on  
7 July 12 and 23rd, 2014, and then on July 25th  
8 Mr. Marciello e-mails Stephen Senior copying Bob  
9 Gorman and you attaching the Red Hill friction  
10 results, and then he wrote what's in his e-mail  
11 below which is indicates:

12 "Four lanes of the parkway  
13 were tested a few days ago.  
14 Performance shows friction  
15 levels continuing to drop.  
16 Quick summary of average  
17 values in 2008 and in 2014."

18 And then he shows the  
19 comparison by lane, each of the four lanes in the  
20 average values in 2008 and in 2014.

21 And at this point before we  
22 get into the specifics of that, I understand that  
23 it was the typical approach in your role as  
24 pavements and foundations that if it was  
25 request -- it was test results resulting from a

1 request from the soils and aggregates section,  
2 that his normal practice would be to e-mail it to  
3 the soils and aggregates people and as well to the  
4 head of pavements and foundations who he reported  
5 which at this point was you. Is that a fair  
6 characterization of the --

7 A. Correct. Yeah.

8 Q. -- usual approach?

9 And so when you received these  
10 and you see who is on there, do you understand at  
11 that point what the purpose of the testing was,  
12 that it was for DSM purposes?

13 A. Sorry, I understood that  
14 this was for DSM purposes. So in DSM purposes  
15 itself then the result basically decision and  
16 everything will be made by the soil and aggregate  
17 section itself. The head of soil and aggregate  
18 generally will be the contact point and key point  
19 to actually disseminate any information and make  
20 the decision whether the aggregate should remain  
21 on the DSM or qualify as a DSM aggregate itself.

22 Q. Right. So if the testing  
23 is in the first two years, typically we've heard  
24 that then it's about whether the aggregate can be  
25 included on the DSM and after that it's subsequent

1 monitoring --

2 A. Correct.

3 Q. -- about continuation on  
4 the DSM; is that right?

5 A. Correct.

6 Q. Okay. And Mr. Marciello  
7 provides a comparison of the 2008 and 2014  
8 numbers. Do you recall if he was requested to do  
9 that or if he just did that? Do you have any  
10 recollection of that?

11 A. I think generally he --  
12 for DSM he may have actually just do it itself.  
13 Because a lot time for DSM they want to look at is  
14 there a long-term trend of the friction number.

15 Q. Okay. Did you request  
16 it, let me put it that way?

17 A. I did not request it, but  
18 I think something he had done, and subsequent to  
19 this I have seen him actually provide some similar  
20 thing for different DSM site itself where he put  
21 the multiyear friction number in -- you know, in a  
22 column so that we can see the trend, if there is  
23 any.

24 Q. All right. And at that  
25 time do you recall if you reviewed the attachments

1 and reviewed the detailed test data in addition --

2 A. Because the moment it's  
3 DSM I would take a very cursory look itself. I  
4 would not really look at it in depth because as  
5 indicated the -- for DSM aggregate qualification  
6 the soil and aggregate -- head of soil and  
7 aggregate is actually responsible for the file,  
8 whereas if it is a regional GeoTech request in  
9 pavement section, I would be responsible for the  
10 file.

11 So given that I'm actually not  
12 responsible for the file, if there's some input we  
13 would likely just provide our input to the head of  
14 soil and aggregate, and it's up to the head of  
15 soil and aggregate to make further their decision  
16 as required given that he is actually in charge of  
17 the DSM aggregate and correspondence to  
18 stakeholders.

19 Q. Okay. So I understand  
20 that from -- as a general practice. What I'm then  
21 wondering is whether in this instance, you recall  
22 having at the time a look at the attachments with  
23 the detailed results?

24 A. As I say, I -- probably I  
25 did a cursory look at the result itself and saw

1 the comment as made by Frank himself when he send  
2 to the soil and aggregate section.

3 Q. Okay. And before we go  
4 into the specific results, I want to ask you --  
5 see if we can clarify an issue that's arisen,  
6 which is --

7 Actually why don't we just go  
8 to MTO22943, and if we could use the native file.  
9 22943. And if we could look at the detail tab.  
10 And this is for the northbound lane 1.

11 (Technical interruption).  
12 Sounds like a DJ dragging the needle across a  
13 record.

14 In these results for all four  
15 of the lanes there's a -- two columns, the second  
16 and third columns from the left are GPS  
17 coordinates, latitude and longitude. And for  
18 prior years, and I appreciate you weren't in the  
19 position of head of pavements when the prior year  
20 testing was done, but they do not include GPS  
21 readings, and --

22 A. Correct.

23 Q. Okay. And so can you  
24 illuminate us on that?

25 A. Because we actually --

1 after the network testing and everything, I  
2 actually want much more better referencing of the  
3 location where we have done tests, and that's why  
4 we initiate procuring the GPS unit for the  
5 friction trailer in April of 2014.

6 Q. Okay, okay. So just a  
7 few months prior to these -- prior to this  
8 testing.

9 A. Correct.

10 Q. Let me guess, if you got  
11 it in April, so was that done prior to the season  
12 of testing for 2014?

13 A. Yes. It is because we  
14 actually commission it as we send the friction  
15 trailer to U.S. itself to do the yearly  
16 calibration, and part of the yearly calibration we  
17 want the equipment upgrade to include the GPS.

18 Q. I see. And is that  
19 Dynatest?

20 A. Yes, it is.

21 Q. Okay. Yeah. Because  
22 Mr. Marciello testified that he thought the GPS  
23 was installed when it was sent to Michigan. Is  
24 that where -- for calibration. Is that where they  
25 are located?

1                   A.    I think they move from  
2 Michigan to Atlanta --

3                   Q.    Okay.

4                   A.    -- around that time  
5 itself.

6                   Q.    Okay.  But in any  
7 event -- and he also talked about -- he didn't  
8 know, though, when that -- if that occurred or  
9 where that occurred in relation to there being a  
10 replacement of the trailer itself.  So can you  
11 tell us about when the MTO purchased and then --  
12 and replaced its prior skid trailer?

13                  A.    I think the new  
14 replacement comes in in 2019 itself or so.  
15 Whereas this old one, we maintain for a while and  
16 did the GPS upgrade in 2014.

17                  Q.    Okay.  And when was the  
18 skid trailer that was in use in 2014 on which the  
19 GPS was affixed -- when was that one purchased?  
20 Have you been able to determine that?

21                  A.    I think that is way  
22 before my time, around 2003 if I'm not wrong.

23                  Q.    Okay.  Have you made  
24 inquiries to satisfy yourself about that?

25                  A.    I tried to find out, but

1 it has been quite a while, so I'm still trying to  
2 get a definitive answer on when that one was  
3 procured.

4 Q. Okay. But are you  
5 confident that it was in the early 2000s, if not  
6 the exact date?

7 A. I think in early 2000  
8 based on some of the correspondence that basically  
9 my staff have been able to dug up.

10 Q. Okay. And what about --  
11 is it before 2007?

12 A. I think it's before 2007.

13 MR. LEWIS: Okay.

14 Commissioner, it is just before 11:30 which is our  
15 typical time for a break. And before I get into  
16 the specific 2014 results, this might be a good  
17 time.

18 JUSTICE WILTON-SIEGEL: That's  
19 fine. Let's return at quarter to 12:00. We'll  
20 stand adjourned until that time.

21 --- Recess taken at 11:28 a.m.

22 --- Upon resuming at 11:45 a.m.

23 MR. LEWIS: Back from break.

24 May I proceed, Commissioner?

25 JUSTICE WILTON-SIEGEL: Please



1 do.

2 BY MR. LEWIS:

3 Q. Okay. So, Mr. Lee,  
4 coming back, then, to the actual results. And,  
5 Registrar, if we could pull up again image 96.

6 And while he's doing that, we  
7 can absolutely look at the specific -- at the  
8 results like we were just before the break. We  
9 can do that too. And I may take you to it, but if  
10 any time that's what you want to look at, we can  
11 do that. We can pull up to two at a time to have  
12 on the screen.

13 Okay. So you received these  
14 results and you described the context in which you  
15 received them. And do you recall what your view  
16 was of these results at the time?

17 A. I guess when I look at  
18 the result itself, it is dropping to near to level  
19 that we would definitely look at continuous  
20 monitoring of the result if it is actually a  
21 regional project. And for DSM then, it is up to  
22 the soil and aggregate section to see what  
23 monitoring or action that they require further  
24 from this. But internal discussion, if we ever  
25 have one, would be you need to continue to monitor

1 the DSM aggregate.

2 Q. Okay. So a couple of  
3 things there. The first thing is before  
4 discussions, I just wanted to talk about your  
5 view. So if I got you correctly that if it was a  
6 regional request, if the reason for the skid  
7 testing in the first place was because a region  
8 had requested it, that because the results are  
9 dropping -- you said -- the dropping to a level  
10 that you would definitely look at continuous  
11 monitoring, if it was a request.

12 Now, the average results are  
13 still a little bit above 30, so --

14 A. Correct.

15 Q. Right, so are you saying  
16 that you wouldn't necessarily -- and you correct  
17 me if I'm wrong. Are you saying that if that was  
18 the case, your recommendation would be, look, we  
19 should continue to friction test this but not  
20 necessarily get into a further investigation? Is  
21 that what you're saying?

22 A. That would be monitored  
23 to see how the trend of the friction number goes  
24 itself, and if it still drop further, then  
25 definitely we would look at additional factors

1 above and beyond just friction number alone.

2 Q. Right. So with that --  
3 if it continued to drop, if I understand you  
4 correctly, then you would get into the different  
5 assessments that you described earlier?

6 A. Correct.

7 Q. Okay. And then you also,  
8 then, referred to discussions, internal  
9 discussions I think you said. Do you recall if  
10 you did have internal discussions about this,  
11 about these results?

12 A. No, I don't think we did.  
13 It was sent to the soil and aggregate section and  
14 then basically from what I understood is they were  
15 the one that make the decision. And the last I  
16 heard of it is that the Demix Aggregate was drop  
17 from the DSM because they did not pay the fees to  
18 the ministry for it being on DSM.

19 Q. Okay. So that's much  
20 later. We know that's in 2016. But at this point  
21 are -- you're saying you don't recall any  
22 conversations? You didn't even talk to  
23 Mr. Marciello about it?

24 A. No, I don't recall  
25 talking to Mr. Marciello. The only one time that

1 I might have, Becca Lane may have approached me to  
2 maybe have a conversation with Steve Senior. But  
3 then before we have that meeting itself, he retire  
4 so that basically meeting did not take place.

5 Q. Sorry, you said "may  
6 have." Do you have a specific -- do you have a  
7 recollection that Ms. Lane --

8 A. No, we did not have a  
9 meeting because he retired, and we did not have  
10 that meeting. I know at one point I think Becca  
11 was trying to initiate a meeting between pavement  
12 section and soil and aggregates section, but that  
13 meeting did not take place.

14 Q. Okay. About Demix  
15 Aggregates specifically?

16 A. Yeah, about Demix  
17 Aggregate.

18 Q. Okay. So I can tell you  
19 that Ms. Lane had testified that after -- that at  
20 some point after these results came in, and she  
21 wasn't copied on this e-mail of course, that  
22 Mr. Marciello with Mr. Gorman came to visit her in  
23 her office, and they wanted to talk about Demix  
24 Aggregates and these results, and they showed her  
25 the results, and then the three of them went over

1 to Mr. Senior's office and had a further  
2 discussion about it, and that ultimately the  
3 decision was made that Demix would continue on the  
4 DSM. So that's what we -- her recollection was of  
5 there being a meeting, and that one didn't involve  
6 you.

7 A. Correct.

8 Q. Are you talking about  
9 something around that period of time, around the  
10 time of these results or -- I mean, if it's up  
11 close to the time when Mr. Senior left, it's much  
12 later than that. It's either in 2015 --

13 A. This is much later than  
14 that (indiscernible) because I know it's -- we  
15 never had the meeting to discuss it after -- you  
16 know, when he -- by the time he want to schedule  
17 something, he already announced his intention to  
18 retire, so that meeting never took place.

19 Q. Okay. And what did  
20 Ms. Lane tell you the purpose was of this meeting,  
21 then?

22 A. Well --

23 Q. Or was this initiated by  
24 you or initiated by her? Why don't we start with  
25 that.

1 A. It's not initiated by me.

2 Q. Okay. And so what was --  
3 what did she tell you the purpose was of the  
4 beyond that it was about Demix Aggregates?

5 A. It was to look at the  
6 Demix Aggregate itself because ultimately it's a  
7 granitic source that we have not used, so is there  
8 any other thing that would provide us input into  
9 that. Although soil and aggregate is actually  
10 custodian, sometime the pavement group itself, if  
11 we know of certain source, given that I've worked  
12 in the Ottawa-Carleton area for about 10 years, I  
13 do know of some of the Quebec source itself based  
14 on my previous work as a pavement engineer in  
15 Ottawa-Carleton. Probably is partly why she asked  
16 me to see -- to have a conversation with Steve  
17 Senior on the Demix Aggregate itself. This is  
18 just a general comment on basically just to have a  
19 conversation, but that conversation never  
20 happened.

21 Q. Okay. So I understand  
22 that it never happened. Was the conversation,  
23 though, about whether that -- about whether to  
24 continue Demix Aggregates on the DSM?

25 A. It's basically to see if

1 granitic aggregate of that type itself is suitable  
2 for use in SMA, because granite in Ottawa-Carleton  
3 area have been used in a few instance in SMA, and  
4 I've used it as part of Ottawa-Carleton. So it's  
5 really depending on a lot of the test result and  
6 everything itself would you still consider using a  
7 granitic source for SMA. Because ultimately there  
8 are only very few source of aggregate that can be  
9 used for SMA, so the more source you have likely  
10 it's better for the ministry.

11 Q. Okay. And so when you  
12 say "granitic," you mean granite, a type of  
13 granite?

14 A. Correct. It's actually  
15 the composition, the mineralogy of the aggregate  
16 as granitic nature. So I think in her context it  
17 probably may or may not be related to friction or  
18 could be just strictly can we have another that  
19 can be used for SMA is why the conversation she  
20 wanted me to have with Steve Senior.

21 Q. Okay. And another source  
22 being what? Do you mean Demix Aggregates, or?

23 A. As a asphalt aggregate  
24 itself or SMA.

25 Q. Yes, but do you mean

1 Demix Aggregates, or are you talking about --  
2 because that's not a granite, right?

3 A. The Demix aggregate from  
4 what I understood is granitic in nature, so in  
5 that sense granitic aggregate have a certain  
6 property that works for it and also work against  
7 it. And do I know enough of that itself? At that  
8 point in time I don't.

9 Q. Okay. I --

10 A. Sorry, that was --

11 Q. I'm not a geologist. It  
12 was classified, broadly speaking, as a trap rock.  
13 Is that a granite?

14 A. Trap rock is a different  
15 kind of rock itself. So that is the conversation  
16 I actually need to have with Steve Senior because  
17 technically they are the more expert in the  
18 geological site of thing itself. For me I'm  
19 probably more familiar with the physical  
20 performance of the aggregate given my previous  
21 background.

22 Q. Right. Okay. And that's  
23 fair enough. So really what I just want to  
24 understand is the purpose of going to talk to  
25 Mr. Senior that Ms. Lane asked you to do that.



1 Because at that point we don't have any further  
2 friction test results. The last friction test  
3 results done by the MTO on the Red Hill Valley  
4 Parkway were, and the only ones that Demix  
5 aggregate were used for, was in the Red Hill  
6 Valley Parkway in Ontario, and so what the -- what  
7 would have -- what prompted this discussion?

8 A. As I indicated likely to  
9 see, you know, is it still a source that should be  
10 considered based on all the physical property.  
11 Because ultimately if the friction is one of the  
12 decision you make based on the FN number itself,  
13 and that is the conversation we need to have with  
14 the head of soil and aggregate. Because  
15 ultimately they are the one that will make the  
16 decision to actually lift -- put them on the list  
17 of remove from the list based on a slew of  
18 different properties that we look at.

19 Q. Right. Okay. And do you  
20 recall -- did you ever have any direct  
21 communications with Demix Aggregates?

22 A. No, I don't -- I didn't.

23 Q. No. Okay, okay. And  
24 then coming back to your views of the results from  
25 July 2014, if I understood you correctly, that you

1 were -- that you had a concern that the friction  
2 number was continuing to drop over time rather  
3 than stabilizing. Is that the first thing that  
4 you noted from the results?

5 A. I would say that, you  
6 know, I notice the trend that is dropping, but  
7 it's to a point whereby we would look at further  
8 monitoring.

9 Q. Right, okay. And is  
10 that -- and I guess that's the question. Was that  
11 communicated in any way to --

12 A. The expectation is that  
13 because this is a DSM aggregate itself, the head  
14 of soil and aggregate would make that call. And  
15 that is normally the pace (ph). If there's a  
16 requirement to further monitor, they would  
17 actually instruct our section in the following  
18 year to go ahead and collect friction testing, and  
19 that has been a normal practice.

20 Q. Okay. What was your  
21 experience with DSM aggregates? Were these  
22 results ones that were at the low end of DSM  
23 aggregates?

24 A. I can't say for sure  
25 because when I look at DSM aggregate -- as I

1 indicated earlier itself I would do a very cursory  
2 look given that I know the decision and the  
3 direction will be provided by head of soil and  
4 aggregate. So in that sense unless something very  
5 drastic itself, I would literally basically leave  
6 it to the head of soil and aggregate to make the  
7 decision.

8 Q. No, I get that. I'm just  
9 wondering about your view. You've been very clear  
10 about the division of responsibilities, and I  
11 under- --

12 A. Basically I would say if  
13 I look at it, then basically I would look at it as  
14 further monitoring if you want to maintain it on  
15 the DSM list.

16 Q. Okay. Thank you. If  
17 this was -- just to make sure we close the circle  
18 and we understand the distinction. If this had  
19 been a request by the regions, a region, am I  
20 correct from your answers that you then would have  
21 recommended to them that it be continued -- that  
22 there be continued skid testing in the future to  
23 monitor it for a further drop; is that right?

24 A. Correct.

25 Q. Okay. And if we could

1 look at -- Registrar, if you could pull up MTO --  
2 sorry, MTO22944 and 22946, please, in the native  
3 format, please. There we are. Okay. If we could  
4 go to the chart form on both of them, please.

5 So the one on the left is  
6 northbound lane 2 and the one on the right is  
7 southbound lane 2. And it has the historical  
8 record there. And did you appreciate -- if you'd  
9 recall if you appreciated at the time that the  
10 testing went back to 2007 in the cases of the  
11 southbound lanes?

12 A. Well, I think I saw the  
13 2004 comparison to probably the e-mail that was  
14 sent to me by Frank that compare two years itself,  
15 but I was not really aware that -- you know, there  
16 are so many years of history of testing on the Red  
17 Hill Valley Parkway.

18 Q. Okay. I mean, his e-mail  
19 did the comparison between 2008 and 2014, but we  
20 know that there were the 2007 tests on the  
21 southbound lanes as well, and I'm just wondering  
22 if at the time you appreciated that, or no?

23 A. No. The reason is this  
24 because I think I joined the section way after  
25 some of this initial testing have for already

1 occurred. And as I say, the first instance of the  
2 Red Hill Valley result being copied on is -- I  
3 think is the 2014 result is when the first time  
4 I'm officially copied in on the result.

5 Q. Right. No, I get that.  
6 When you say "officially," did that mean you were  
7 aware of the testing prior to that?

8 A. Not really because if I  
9 do not assume the position of head of pavement and  
10 foundation I would not get any of this  
11 correspondence from Frank.

12 Q. I get that, and you  
13 weren't copied on any of that correspondence from  
14 prior years. The first time you were copied on  
15 any of it was in 2014. Just the words that --

16 A. Correct.

17 Q. It's the word you just  
18 used; you said, "well not really." And so I'm  
19 wondering if you were aware of the prior  
20 testing --

21 A. No, I'm not.

22 Q. -- (indiscernible) 2014.

23 A. No, I'm not.

24 Q. Okay, all right, you were  
25 not. Now you are; you weren't then. Is that

1 fair?

2 A. Yeah. Now I'm aware, but  
3 I'm not aware of that back then.

4 Q. Okay. All right. Now,  
5 if we could look at the detailed results.

6 We already looked at these for  
7 one of them, and as we indicated it shows the GPS  
8 results. And, do you recall if -- you already  
9 said, I think you said that you had a cursory look  
10 at them. You did look at the attachments, but it  
11 was a cursory look. Do you recall if you were  
12 looking so closely as to see the individual test  
13 results?

14 A. No, I'm probably -- when  
15 I do a cursory review, I would review the average  
16 number.

17 Q. Okay. So the one at the  
18 bottom there in the --

19 A. The average of that.

20 Q. 30.7 and 30.5 in this  
21 instance?

22 A. Correct.

23 Q. Okay. Would you look at  
24 the minimum and the maximum and the standard  
25 deviation?

1                   A.    I would look at the  
2    standard deviation to see how far it is from the  
3    mean, and then that basically gave me a rough idea  
4    is the min and max reasonable.

5                   Q.    Okay.  And your  
6    conclusion was?

7                   A.    It looks reasonable.  The  
8    average number looks reasonable.

9                   Q.    Okay.

10                  A.    So sometimes I just look  
11   at is the min and max roughly one-and-a-half  
12   standard deviation away from the average  
13   (indiscernible).

14                  Q.    All right.  And so in  
15   that -- you're indicating that you wouldn't have  
16   been looking at the individual results that were  
17   below 30 in this instance; is that correct?

18                  A.    Correct.

19                  Q.    Okay.  And would you have  
20   spent as much time reviewing it as we have just  
21   spent?

22                  A.    No, likely not because I  
23   would just cursory glance at the number -- and  
24   back in 2014, and if that's the timeframe itself,  
25   the way that we would analyze and look at the

1 result would be based on average result given.  
2 That's the standard that we have actually look at  
3 how to interpret ASTM standard. And then  
4 basically, as I say I would do a very fast look at  
5 the mean and standard deviation. If the min and  
6 max result are not too far from one-and-a-half  
7 standard deviation away, that tells me the result  
8 is roughly normally distributed. Then I'm saying  
9 the result should be applicable and look at the  
10 (indiscernible) major position based on the  
11 average FN.

12 Q. Okay. Thank you. And  
13 following this, did you ever inform the City of  
14 Hamilton or Golder or any other representative of  
15 the City of Hamilton about the results of the  
16 MTO's testing on the Red Hill Valley Parkway?

17 A. No, as I indicated  
18 because this is a DSM initiative of testing. The  
19 only portal of communication would be through the  
20 soil and aggregate section itself.

21 Q. Right.

22 A. I would not contact any  
23 of the stakeholder because ultimately that  
24 responsibility lies with the soil and aggregate  
25 section.



1 Q. Right. You would have  
2 had the authority to do so though, correct?

3 A. I would have the  
4 authority to discuss it with the head of soil and  
5 aggregate itself. But then, ultimately as a  
6 protocol, similarly if it is a regional request of  
7 the friction testing through the pavement section,  
8 even if soil and aggregate is aware of the  
9 testing, the communication to the region have to  
10 come through the pavement section. As similar  
11 reciprocal protocol is like if it is DSM aggregate  
12 testing communication -- the line of communication  
13 is through soil and aggregate section.

14 Q. Okay. So first of all,  
15 by a "protocol," I take it you're not talking  
16 about a written protocol; you're undertaking about  
17 a practice or an understanding?

18 A. Well, that is basically  
19 our role and responsibility. In terms of when  
20 you're the head of soil and aggregate, designated  
21 source aggregate qualification strictly is your  
22 responsibility; whereas with the regional GeoTech  
23 is chairing the GeoCon, the liaison and actually  
24 implementation of standard specification and  
25 policy with the regional GeoTech result with the

1 head of pavement. So that is quite a clear  
2 definition of our role and responsibility.

3 Q. Sorry, I understand the  
4 difference, but there's nothing spelling out to  
5 say that you can or cannot disclose results from  
6 testing requested of your section by soils and  
7 aggregates. There's nothing in writing or a  
8 directive or anything else that says you can't  
9 disclose this to a third party; is that fair?

10 A. Well, I think it's a  
11 protocol that has been established way before my  
12 time, whereby it's DSM, the order result goes to  
13 the soil and aggregate section, and decision will  
14 be made by the soil and aggregate section. That  
15 basically is the direction that I understood how  
16 DSM is administered in the ministry.

17 Q. Right. No, that's the  
18 DSM, though. I'm just talking about communicating  
19 with the City of Hamilton --

20 (Speaker overlap)

21 A. -- if you tell me these  
22 are DSM testing, then it is actually the DSM  
23 protocol that I have to follow.

24 Q. Okay.

25 A. If this was not a DSM

1 testing of the aggregate, then we would have  
2 followed other protocol of reporting and providing  
3 technical assistance.

4 Q. All right. You were  
5 contacted by Vimy Henderson of Golder in  
6 October 2013, so just the prior year, about  
7 whether the MTO could conduct skid testing for  
8 Hamilton, and you declined to do so on the basis  
9 Mr. Marciello was too busy, the network testing  
10 was going on at the time --

11 A. Correct.

12 Q. -- and you suggested that  
13 she might go to another party for testing.

14 A. Correct.

15 Q. Did it occur to you at  
16 this point in 2014 that Ms. Henderson had made the  
17 request earlier? Is that something that crossed  
18 your mind that the point?

19 A. Well, I did not know that  
20 basically it is related to the same issue itself.  
21 Because, as I say, if they've come through her as  
22 part of the municipal request, the protocol, then  
23 I would have -- had redone the testing, and I  
24 would have interact with her. Like it's not a DSM  
25 request. But if I have known that thereafter that

1 is a DSM request, then it would be handled through  
2 protocol of actually the soil and aggregate  
3 section.

4 Q. Okay. I understand --  
5 you said a protocol, what I'm asking --

6 (Speaker overlap).

7 A. -- I'm not aware that  
8 it's actually tied to previous testing before.

9 Q. I'm not asking you  
10 whether it's tied to it. I'm asking whether it  
11 occurred to you at this point that when you get  
12 these results and you have the thoughts that you  
13 had about it, did you think about Ms. Henderson  
14 having made the request for skid testing in the  
15 prior year?

16 A. No, it didn't cross my  
17 mind.

18 Q. Okay. And the -- just  
19 the -- just coming back to the protocol that you  
20 talk about. You described a bunch of things.  
21 There was a lot things that you said there. I  
22 just want to be clear that there's nothing that  
23 said that you could not disclose the results to  
24 the City of Hamilton or Golder had you chosen to  
25 do so; is that fair?

1 MR. SAAD: Mr. Commissioner, I  
2 think Mr. Lee has answered this question to the  
3 best of his abilities. He's made it clear that --

4 JUSTICE WILTON-SIEGEL: That's  
5 fine, Mr. Saad. I think, Mr. Lewis, it's clear  
6 that there was no written protocol, but that there  
7 was an understanding which Mr. Lee had with  
8 respect to how to handle requests.

9 MR. LEWIS: Right. And I  
10 would like to ask him about what Ms. Lane did in  
11 2010.

12 JUSTICE WILTON-SIEGEL: That's  
13 fine. You can go on. I think you're just asking  
14 the same question here, and Mr. Saad is correct,  
15 that it's been answered.

16 MR. LEWIS: Thank you.

17 BY MR. LEWIS:

18 Q. So I think you indicated  
19 that this protocol was from prior -- you know,  
20 before your involvement, before you were in this  
21 position. We did hear from Ms. Lane that in 2010  
22 after Mr. Marciello conducted the testing in that  
23 year, it raised some concerns for her, but  
24 Mr. Marciello provided her with the results in  
25 November 2010, and she contacted Dr. Uzarowski of

1 Golder about it. And as she was your one-removed  
2 predecessor in that context, and she was also  
3 dealing with results, with skid test results, that  
4 were conducted for the purposes of the DSM at the  
5 request of soils and aggregates, she nonetheless  
6 took it upon herself to contact Golder.

7 So I'm wondering where this  
8 unwritten protocol came from, in your  
9 recollection.

10 A. Well, I guess it's when  
11 I'm basically -- when I know took the position  
12 itself, you know, they are basically briefing of  
13 what is my role and responsibility, and I guess  
14 that's basically when we discuss about DSM with  
15 the aid of soil and aggregate and everything.  
16 They point blank said that they are the custodian  
17 of the DSM, and that's the flow of information  
18 expectation from us. Although, we basically  
19 perform the testing function for soil and  
20 aggregate section. So there is an understanding  
21 between the pavement group and the soil and  
22 aggregate because the head of soil and aggregate  
23 sometime also attend GeoCon, whereby we actually  
24 performed technical assistance role to the  
25 regional GeoTech and soil and aggregate were we

1 not involved, or they can provide input, but  
2 ultimately how to direct the regional GeoTech  
3 result with the head of pavement section itself.  
4 So in that sense, after a few of those event,  
5 unofficially we have established a protocol of how  
6 basically some of these thing are committed  
7 between the two section.

8 Q. Okay. We know that in  
9 2010 and those are the results I was talking about  
10 with respect to Ms. Lane and her communication  
11 with Golder, that in 2010, Mr. Marciello tested  
12 the Red Hill Valley Parkway at around 100  
13 kilometres an hour rather than the posted speed of  
14 90, and -- as he had done in every other year, and  
15 that in 2011 he corrected the 2010 results in the  
16 historical tracking charts that you were reviewing  
17 in 2014.

18 Do you recall discussing that  
19 issue with him at any point, that there had been a  
20 test speed discrepancy at some point?

21 A. I think we had a  
22 discussion, but it likely is much later than that  
23 itself. It's because I think the way that the  
24 speed correction was done was by lieu of time of  
25 reducing the point by two point for whatever speed

1 it is. Plus, my recollection is that I'm saying  
2 if you want to do a speed reduction competition,  
3 you actually need to test it at two different  
4 speed and come up with the curve that we have now  
5 come up with to do the correction because it's not  
6 -- it is a rule of thumb only rule.

7 Q. All right. Okay. And  
8 you said you think it would be at a much later  
9 point in time. I mean, obviously it wasn't 2010  
10 because you weren't the position then --

11 A. That's correct.

12 Q. -- so what are you  
13 talking about?

14 A. It would be much later,  
15 but I can't tell you the exact date.

16 Q. Okay. Certainly after  
17 you became the head of pavements and foundations,  
18 I assume?

19 A. Likely, yeah.

20 Q. Okay. And, would it have  
21 been at the time of the 2014 results, the  
22 discussion when you reviewed the --

23 A. It likely is after that  
24 because we know that 2014 I would not be able to  
25 see the differences itself.



1 Q. Right.

2 A. Because I think the first  
3 time I look at the result from Red Hill Valley is  
4 after the 2014 result, and probably he had  
5 mentioned, you know, I guess internal speed. That  
6 is one of the thing that I know for a fact.  
7 Because you test at different speed, you will get  
8 different number for the same pavement itself.  
9 It's why we actually expand program to do test at  
10 different speed so that we can make the jump from,  
11 you know, inferring result that we have done  
12 before under a posted speed itself back to FN65.

13 Q. Right. But -- so that,  
14 though, suggests that you did have a conversation  
15 with Mr. Marciello about the 2014 results, and --

16 A. After the fact, way after  
17 the fact. If you notice any anomaly and how you  
18 adjust it, I may not agree with how he adjust it  
19 by just using in lieu of time. I would say you  
20 will probably -- we will need look at what is the  
21 result you come up with after the network testing,  
22 and then to the adjustment accordingly even if you  
23 have to revise it again.

24 Q. Right, but there's  
25 nothing in these results here that show the test

1 speed anomaly in 2010, so it can only -- it could  
2 come up by way of a discussion. So, I'm wondering  
3 if it was in the context of the discussion about  
4 these results and the trajectory that you  
5 discussed over time?

6 A. I guess the only thing  
7 that I remember recalling that the conversation  
8 with him is that there was -- I did ask, you know,  
9 what is the test speed of some of the test itself,  
10 and I guess he indicate some of it was at 90, some  
11 was at 100. And I'm saying if you test it at 90,  
12 at 100, there likely will be a difference in the  
13 answer, strictly not because of the testing; it's  
14 because the speed you test it have a impact on the  
15 FN value. And he actually -- I do recall that he  
16 told me that there's a rule of thumb how he would  
17 correct those result itself, and I say, I may or  
18 may not agree with that.

19 Q. Okay. All right. Is  
20 there any other time you would be talking to him  
21 about it other than when you got the 2014 results  
22 from him? I mean is he --

23 MR. SAAD: Mr. Commissioner, I  
24 think Mr. Lee is --

25 JUSTICE WILTON-SIEGEL: I will

1 allow the last question, Mr. Saad, because it is a  
2 little different. And I understand what he's  
3 going for, but Mr. Lewis, I think this will be the  
4 last question on this topic.

5 MR. LEWIS: Thank you.

6 THE WITNESS: Yeah. It likely  
7 will be a time when he have shown me some of the  
8 result and likely the 2014 result -- after the  
9 2014 result, because without that there is no  
10 basis for us to have the discussion.

11 BY MR. LEWIS:

12 Q. Right. Okay. Thank you.  
13 Okay. If we could go, Registrar, to overview  
14 document 8 and image 27. And it's 27 and 28,  
15 paragraph 64. Yeah.

16 And so this is on  
17 December 11th, 2017, jumping ahead a few years  
18 now. Dr. Uzarowski from Golder e-mailed you, and  
19 at the top of page 28, if you could just expand  
20 that for us, please, Registrar. He asked you:

21 "Do you know who at MTO can be  
22 polished stone value, PSV,  
23 test, and, if, could you  
24 please send me the contact  
25 information. I have to do it

1                   for one of the large  
2                   municipalities here.  
3                   Typically, we would send the  
4                   samples to Ireland or the UK,  
5                   but due to urgency I wonder  
6                   this can be done by MTO."  
7                   And -- if you could take that  
8                   down, please.

9                   And then you replied, next  
10                  paragraph, 65, and you gave him contact  
11                  information for Joel Magnan, who was the ahead of  
12                  soils and aggregates at that point, Mr. Senior  
13                  having departed the MTO.

14                  A.     Correct.

15                  Q.     Right.  And then -- do  
16                  you recall these communications?

17                  A.     Yes, I do.

18                  Q.     Okay.  And then in  
19                  paragraph 66 you'll see Mr. Magnan, whom you had  
20                  copied, replied the same day, and he copied you  
21                  advising Dr. Uzarowski that the MTO couldn't  
22                  perform the testing, noting that it performs it  
23                  for the -- the PSV testing for the purposes of  
24                  maintaining the DSM list and doesn't have the  
25                  resources for third party requests.  And he

1 suggested AMEC and as well some other on options  
2 in his e-mail. And then finally --

3 I guess if you could move up  
4 the next image as well. So it's 28 and 29.

5 He replied "thanks for the  
6 clarification to Joel" and that they've done  
7 testing in the UK and Ireland in the past.

8 Finally, at the top of the  
9 next page he replied and I -- he didn't copy you  
10 on this one. Mr. Magnon replies saying:

11 "Okay, but we confirmed this  
12 year that there is a lab in  
13 Hamilton that does the test,  
14 so that is another option  
15 (AMEC)."

16 Were you aware that this  
17 request pertained to the City of Hamilton at the  
18 time?

19 A. No, I didn't. Because it  
20 was requested to do PSN, I just basically --  
21 because he wants a contact for that testing and  
22 the right person to contact is Joel Magnan, so I  
23 provided him with the contact, and he can follow  
24 up on it. So that was the end of my involvement  
25 with Ludomir on this issue.

1 Q. That's because soils and  
2 aggregates does the PSV testing?

3 A. Correct.

4 Q. And sorry, I said  
5 about the -- I asked if you were aware about the  
6 City of Hamilton. Would it be correct you were  
7 also not aware that it was in relation to the Red  
8 Hill Valley Parkway?

9 A. No, I did not know --  
10 realize that it was tied to Red Hill Valley.

11 Q. The last thing I would  
12 like to take you to is, we discussed earlier that  
13 in 2014 the MTO had the GPS device included on the  
14 skid trailer, right?

15 A. Correct.

16 Q. Okay. And we know that  
17 after the whole story broke publicly, which led  
18 ultimately to the calling of this inquiry in 2019,  
19 February 2019, Kevin Bentley of the ministry, of  
20 the MTO sent an e-mail to Ed Soldo, of the City of  
21 Hamilton, and he attached a spreadsheet with Red  
22 Hill Valley Parkway skid test data from 2008 to  
23 2014. And at this point the story had broken, and  
24 the City and the MTO were in communications about  
25 what had happened.

1                   And Ms. Lane had testified  
2   that she got involved because the initial question  
3   was about whether the MTO had done Red Hill Valley  
4   Parkway skid testing. And she testified that she  
5   first spoke to you and asked about it, and you  
6   had -- and asked if skid testing had been done.  
7   And you had first said no, there hadn't been any  
8   testing. Do you recall that conversation?

9                   A.   Not really.

10                  Q.   Okay. And in any event,  
11   she then testified that she was getting  
12   information about what had occurred and -- from  
13   MTO staff, and that included getting the test  
14   data.

15                  A.   Correct.

16                  Q.   Right. And do you  
17   recall, was it you that gave her the spreadsheet  
18   with test data? And I'll take you to the  
19   spreadsheet, but do you recall?

20                  A.   Yeah, I'd like to see the  
21   spreadsheet itself is that the one that we  
22   provided.

23                  Q.   Okay. So if we could  
24   pull up two documents. One is HAM54585, and  
25   that's not a spreadsheet; that's just an e-mail,

1 so we don't need the native for that. And the  
2 second is HAM54586, and I would like that in the  
3 native format, please.

4 THE REGISTRAR: Counsel, did  
5 you want them side by side or one at a time?

6 MR. LEWIS: Let's pull up the  
7 e-mail first.

8 (DISCUSSION OFF THE RECORD)

9 BY MR. LEWIS:

10 Q. So you'll see at the  
11 bottom of this e-mail on February 12th, this  
12 chain. Edward Soldo asked Kevin Bentley, copy to  
13 Ms. Lane:

14 "Thank you for providing the  
15 graphs. Can you provide the  
16 underlying data that developed  
17 them." (As read)

18 As well as further  
19 information. And then on February 13th you'll see  
20 Mr. Bentley e-mailed to Mr. Soldo copying  
21 Ms. Lane:

22 "As requested, attached is the  
23 underlying data. Also  
24 attached is the mix design."  
25 (As read)



1                   And then it just gets  
2   forwarded on within the City. And then so the --  
3   so this is just to give you the date and the  
4   context. And then the other document please,  
5   Registrar, HAM54586 in native.

6                   So there's a number tabs to  
7   this, but it -- on the first tab "Project  
8   Summary," it contains the dates from 2008 through  
9   2014, of course with the exception of 2013, and  
10   then on the rest of the tabs it's the same. Do  
11   you want to have a look at them?

12                  A.    Yeah. This table, I'm  
13   actually not familiar with it, and I don't think I  
14   have seen it before until now, to be frank,  
15   because, I've not summarized my section. If they  
16   have summarized this thing, it's actually  
17   summarized without my knowledge.

18                  Q.    Okay. Well, that's -- I  
19   don't know if it's a summary --

20                  A.    If it's all SMA and if it  
21   is SMA and format summarized in this way, I would  
22   have known, but I don't recollect ever seeing a  
23   table like this.

24                  Q.    Okay. Just look at the  
25   test data.

1 A. Yeah. Sure.

2 Q. Yeah. And move up again.

3 It's the -- it's all done by year starting back in  
4 2008 at the top?

5 A. Yeah. I'm not sure who  
6 summarized this data itself.

7 Q. Okay.

8 A. The (indiscernible)  
9 likely is from pavement and foundation from some  
10 hard drive somewhere, but the way that this is  
11 formatted and reported, I'm not familiar with it.

12 Q. Okay. Because  
13 Mr. Marciello he had -- the reason I ask is  
14 Mr. Marciello had pointed out, it's in a different  
15 format than he produced his skid test reports, of  
16 course, as we've seen, and so he did not know how  
17 it was generated, and I -- from your evidence you  
18 also are not sure about that. You don't know  
19 that. Can it all just be downloaded from the skid  
20 trailer, from the software? Do you know?

21 A. Yes. The data can be  
22 downloaded, and then you can summarize the data  
23 combination or the data in different format  
24 itself. As I say, this is the first time I see it  
25 in this format.

1 Q. Okay. Okay. That --  
2 thank you. I don't have any further questions,  
3 Commissioner.

4 JUSTICE WILTON-SIEGEL: Okay.

5 MR. LEWIS: Thank you,  
6 Mr. Lee.

7 THE WITNESS: Yes, thank you.

8 MR. LEWIS: Now, Counsel for  
9 the participants had indicated before they all  
10 asked to reserve some time, but I don't know if  
11 anyone has any questions. So perhaps we could  
12 start with counsel for the City.

13 MS. JENNIFER ROBERTS: First,  
14 before we go there, may I just raise a point?  
15 And, Commissioner, I just want to address a piece  
16 of an actual question asked by Mr. Lewis earlier,  
17 in which he was talking about the -- Becca Lane,  
18 her e-mail of November 15, 2010. And Mr. Lewis, I  
19 think you said that after Frank conducted the  
20 testing, it raised the concern in November of 2010  
21 and that Becca Lane contacted Dr. Uzarowski about  
22 it.

23 The evidence was that Becca  
24 Lane contacted Ludomir Uzarowski for a contact for  
25 Hamilton, not to talk about -- not to talk about

1 that testing.

2 JUSTICE WILTON-SIEGEL: No, I  
3 understand that.

4 MS. JENNIFER ROBERTS: Okay.  
5 Thank you.

6 MR. LEWIS: Okay. So perhaps  
7 we could start with Mr. Chen, or Counsel could  
8 advise how long they would like if they have any  
9 questions.

10 MR. CHEN: I have no  
11 questions, Mr. Lewis.

12 MR. LEWIS: Okay. And  
13 Ms. Roberts?

14 MS. JENNIFER ROBERTS: Thank  
15 you. I have no questions either.

16 MR. LEWIS: Mr. Buck?

17 MR. BUCK: I have no  
18 questions.

19 MR. LEWIS: Okay. Ms. McIvor?

20 MS. MCIVOR: I do have a brief  
21 follow-up question, yes.

22 JUSTICE WILTON-SIEGEL: Go  
23 ahead.

24 EXAMINATION BY MS. MCIVOR:

25 Q. Thank you.

1 Registrar, if you could please  
2 pull up overview document 6, image 71. Or I'm  
3 sorry, it must be overview document 4, image 71.  
4 Okay. And I stand corrected. It must be overview  
5 document 6, 71. I apologize.

6 JUSTICE WILTON-SIEGEL: I  
7 think it is, yeah.

8 MS. MCIVOR: Okay. And,  
9 Registrar, if you could call out the top two  
10 paragraphs I would appreciate it. Thank you.

11 BY MS. MCIVOR:

12 Q. Hi, Mr. Lee.

13 A. Yeah. Hi, Heather.

14 Q. Mr. Lewis earlier took  
15 you to this request which is the request from  
16 Dr. Henderson, of Golder.

17 A. Yes.

18 Q. And I see here that the  
19 request is for testing on the Lincoln Alexander  
20 Parkway, also for testing within the municipality,  
21 at crosswalks and on the Red Hill Valley Parkway,  
22 and there's reference to -- each lane being 18  
23 kilometres in length; is that fair?

24 A. Yeah. This is quite an  
25 extensive request itself from Vimy itself on this

1 thing, and that's why, when we look at it based on  
2 what we need to do in the performance-based  
3 specification definitely we can't accommodate it.

4 Q. Okay. And so you -- your  
5 evidence is that you knew upon reviewing this  
6 request that it was too extensive to be  
7 accommodated without further discussion with  
8 anybody in the unit?

9 A. No. In fact, I actually  
10 make that decision because we already behind in  
11 terms of the network level testing which we  
12 required the result to develop the  
13 performance-based specification that we are in a  
14 very tight timeframe to develop. So with that  
15 itself I actually make the decision that it cannot  
16 be accommodated given that the request is so  
17 extensive too.

18 Q. Okay. I understand. And  
19 from this extensive request, did you form an  
20 understanding or did you understand that the City  
21 had any specific concern or issue with the Red  
22 Hill Valley Parkway?

23 A. At that point in time,  
24 I'm not aware of (indiscernible) had not been  
25 conveyed to me that there is an issue with Red

1 Hill Valley Parkway.

2 Q. Okay. And do you -- I  
3 see you referred them to ARA; that is an external  
4 agency that conducts --

5 A. That's (indiscernible).

6 Q. -- the testing.

7 A. It's a third party  
8 consultant that can do the same testing, and I  
9 know for a fact they have the same ASTM  
10 brake-force trailer as the ministry.

11 Q. Okay. And was it your  
12 understanding that this resolved that issue, or  
13 were they in further contact with you about this  
14 same matter?

15 A. No, I think that  
16 basically after that itself I assume that they  
17 have got their testing equipment that they  
18 required, and do whatever testing that they  
19 required, and we did not communicate further on it  
20 after that.

21 Q. Okay. Thank you. And  
22 now my last question is about that 2008 versus  
23 2014 results that Mr. Marciello sent you. My  
24 friend asked you whether you thought the results  
25 were acceptable, and you said, yes, and then you

1 said -- you referred to a continued monitoring.  
2 So just to clarify, that would have been continued  
3 monitoring for inclusion on the DSM; is that what  
4 you were referring to?

5 A. Yeah. Because if you  
6 want to include it for DSM, the DSM don't look at  
7 just the immediate term performance of the  
8 friction number. We also continue to look at the  
9 friction performance over time, in terms of  
10 several years to see what is the performance long  
11 term, and that is my personal opinion why DSM is  
12 actually superior to friction spec that basically  
13 ask for only one-time friction number. Because as  
14 I indicated, if you ask for a certain threshold  
15 value of friction in year one, what happened if  
16 that number deteriorate to below the performance  
17 level you want in year three. Whereas the DSM --  
18 in the DSM environment because the aggregate and  
19 the mix itself that you place down in the trial,  
20 this morning (indiscernible) over a number of  
21 years, so you have a -- if I put your -- and  
22 continue to put your aggregate on the DSM list, it  
23 imply it will mix itself constructed using those  
24 aggregate not only have medium term performance  
25 but long-term performance. And the continued



1 monitoring, we would actually carry out on all DSM  
2 aggregate that we qualified because that is the  
3 only way that we can have assurance that those  
4 aggregate have long-term performance.

5 Q. Okay. And, so, by that  
6 you mean the long-term frictional characteristics  
7 of this aggregate, that's what you would continue  
8 to assess?

9 A. Correct. Because that is  
10 part and -- an integral part of the DSM is that  
11 you actually monitoring the friction performance  
12 not only as constructed, but a number years after  
13 it's constructed, we still keep monitoring to  
14 ensure, like, the performance is there which is  
15 the difference between one time -- the  
16 performance-based specification requirement versus  
17 DSM aggregate where we actually run through the  
18 initial conditioning of the aggregate using a  
19 polished stone value system, and we admit you  
20 place test, 500-metre test strip somewhere where  
21 we will test --

22 Q. Right.

23 A. -- over a number of years  
24 to actually ensure that the performance continue  
25 long term.

1 Q. Okay. Thank you,  
2 Mr. Lee. My last question.

3 Mr. Lewis asked you about to  
4 whom you disclosed those 2014 results, and you  
5 spoke about your practice being to loop in with  
6 the soils and aggregates because that was in fact  
7 their work product. Did I get that correct?

8 A. Correct. Because if it  
9 is DSM testing and spec itself, then automatically  
10 the pavement section would do the testing, but we  
11 are not the custodian of the result; soil and  
12 aggregate is the custodian. And hence, if there's  
13 any communication with stakeholder and everything,  
14 it will have to come out through the soil and  
15 aggregate section.

16 Q. Okay.

17 A. That is the protocol we  
18 follow.

19 Q. Okay. Fair enough. And  
20 I appreciate that you didn't have concerns with  
21 the data, but is your evidence that if you did  
22 have concerns, then you would flag them for soils  
23 and aggregates?

24 A. Yeah. If I have concern  
25 I would have -- if it's a DSM aggregate, a

1 conversation would be with the head of soil and  
2 aggregate section itself.

3 Q. Okay. Thank --

4 A. But not -- I mean --

5 (indiscernible) stakeholder given ultimately the  
6 communication have to come through the soils and  
7 aggregate section.

8 MS. MCIVOR: Okay. Thank you,  
9 Mr. Lee. Those my questions.

10 THE WITNESS: Okay.

11 JUSTICE WILTON-SIEGEL:

12 Mr. Lewis.

13 MR. LEWIS: No further  
14 questions, Commissioner.

15 JUSTICE WILTON-SIEGEL: Okay.  
16 Do I take it we do not have a witness who is  
17 available this afternoon?

18 MR. LEWIS: That is correct.

19 JUSTICE WILTON-SIEGEL: Okay.

20 Well, first of all, Mr. Lee, thank you very much  
21 for attending the inquiry this morning. You're  
22 excused.

23 And the rest of Counsel, I  
24 guess we stand adjourned now until Monday morning  
25 at 9:30. Have a good weekend.

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--- Whereupon at 12:44 p.m. the proceedings were  
adjourned until Monday, May 30, 2022 at  
9:30 a.m.