RED HILL VALLEY PARKWAY INQUIRY

TRANSCRIPT OF PROCEEDINGS
HEARD BEFORE THE HONOURABLE J. WILTON-SIEGEL
held via Arbitration Place Virtual
on Friday, June 24, 2022, at 9:30 a.m.

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Chris Buck	For Dufferin Construction
Jennifer Roberts	For Golder Associates Inc.
Michael Saad	For Ministry of Transportation
Robin McKay	For Tradewind Scientific

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Arbitration Place Virtual

--- Upon resuming on Friday, June 24, 2022,
at 9:30 a.m.

MR. LEWIS: Good morning, Commissioner, Counsel, Mr. Taylor.

Commissioner, today we have Mr. Rowan Taylor of Tradewind Scientific testifying, and counsel for Mr. Taylor and Tradewind is Robin McKay who is also here. Mr. Rowan Taylor's father, Leonard Taylor, is the principal of Tradewind and ran the Tradewind business during the relevant time period, however we've been advised that Mr. Leonard Taylor is not available to give evidence due to his health and has retired from the business. Commission counsel is satisfied that Leonard Taylor's health does not permit him to participate and accordingly we are calling Rowan Taylor who did also have involvement, as you will hear, with the Tradewind testing and report.

And so with that introduction, Registrar, if we could have the court reporter affirm Mr. Taylor.

ROWAN TAYLOR; AFFIRMED

EXAMINATION BY MR. LEWIS:

Q. Good morning, Mr. Taylor.
A. Good morning.
Q. Just to cover some of your background, I understand that you have a bachelor of applied science in aerospace engineering from Carlton University; is that right?
A. That is correct.
Q. When did you graduate from there?
A. That would have been 2010.
Q. And a master's in fluid dynamics engineering from McGill; is that right?
A. That is correct.
Q. When did you obtain that degree?
A. 2013.
Q. And what is fluid dynamics engineering?
A. Broadly, just the study of the mechanics fluids in motion. And of course, there are lots of different fluids, including air, water are most common ones, and that applies to things like aerodynamics.

Q. And are you a practicing engineer?

A. I am not.

Q. Okay. And I understand that you joined Tradewind Scientific in 2005; is that correct?

A. That is correct.

Q. And you were a head office technician from 2005 to 2012?

A. Yes.

Q. You've been the engineering manager and chief technology officer from 2012 to the present; is that right?

A. Yes.

Q. How did -- you were working while you were studying; is that correct?

A. Correct, on a part-time basis generally.

Q. And so your first degree was in 2010 was when you graduated; is that right?

A. Yes.

Q. And were you -- the entire time when you began in 2005, I guess that was before you went to Carlton, or was that --

A. Yes, I think Carlton was

2006 to 2010 and so I would be working part-time during the academic year and full-time during the summer.

Q. Okay. And as I indicated, your father was the COO and president of Tradewind but is no longer actively involved. Does that mean you are functionally the head of the business at this time?

A. That is correct, yes.

Q. And how long have you been operating in that capacity?

A. At least a year and a half at this point.

Q. Could you describe Tradewind's business generally?

A. Yeah, absolutely. We do a lot of different things, but largely centred around airport safety and environmental monitoring, both services in that regard, and also products, training and a few other associated things. And we're active all across Canada, the U.S., and also extensively in northern Europe as well.

Q. All right. And what does that include?

A. Right. That includes things such as measuring the friction on airport runways, providing systems to help airports collect and distribute safety-related information. So this can be anything from the conditions during wintertime on the airfield, you know, how much snow, how much ice, that kind of thing, all the way to maintenance type activities of reports of fog or electrical issues, lights being burnt out. And then training and -- all really centred around airports and airport safety, and in particular of course, different from airport security.

Q. Right. And you mentioned of course friction testing. Is that something that Tradewind has already -- has also done on non-airport situations and particularly on roadways?

A. Yes, we have done a few test series on non-airport pavements.

Q. And how many employees does Tradewind have?

A. Usually about a dozen.

Q. When was the business founded?

A. In 1980.

Q. In 2013 and '14 did you report to your father, Leonard Taylor, at that time?

A. Yes.

Q. What were your duties generally speaking at that time, 2013, '14?

A. Yeah. At that time I was taking on more and more of the systems and software development management role, in addition to a lot of the data processing for friction reporting and just generally helping out in all things.

Q. Okay. And how closely did you work with your father?

A. Very closely.

Q. And being a small company, did you generally know what he was doing and what was going on with him?

A. In general, yeah, definitely.

Q. I understand also that part of Tradewind's business is acting as an agent for manufacturers of friction testing equipment?

A. That is correct. We represent a few different manufacturers actually.

Q. And Tradewind sold a grip tester to the company that operates the 407 ETR?

A. We did.

(Speaker overlap)

Q. It's in the report.

A. Okay.

Q. Could you describe the friction testing equipment that Tradewind both sells and uses?

A. Sure. So we have a lot of familiarity with two classes and three types of friction testing equipment. So in terms of classes, there's what we call spot measurement devices which are used to measure friction largely at a point on the surface, and these are basically for what we call operational friction testing. So typically at airports this is in the winter when our main concern is about contaminants on the runway, snow, ice, sand, chemical, that sort of thing.

And so the spot measurement devices are placed in an inspection vehicle, accelerated to a given speed, and then the inspector slams on the brakes and the wheels are locked -- actually in fact ABS is turned off for

these tests -- and measures the deceleration at approximately a point in the runway. That's the spot friction testing device. And --

Q. Sorry, before you go on is that the ASTM locked-wheel trailer?

A. No, it is not. So in Canada we work with the de facto standard which is the TES instruments mark 3 electronic recording decelerometer. But it is -- the test methodology is indeed wheel locked wheel, locked vehicles in that case.

Q. So that --

(Speaker overlap)

A. It's a lot of technical jargon. So that's the spot friction measurement, and we refer (ph) to it as the TES decel for short.

The other class of device is CFME, continue friction measuring equipment. It's quite different in its operational principle in that the measuring wheel is rotated at slightly slower speed than the vehicle or trailer is travelling, usually in the 10 to 20 percent slip ratio zone, and we work with two types of devices, the Findlay-Irvine GripTester which is quite a

small trailer, and then also the -- broadly called the SFT, surface friction tester, which has been built into a range of vehicles and trailers including Saabs, Volvos, Volkswagen Transporters, and then also a trailer-based version.

And we have a lot of familiarity with, represent, and work with all three of those devices and have for many, many years.

Q. Okay. And typically when non-airport road testing is done do you know what device is typically is used?

A. Yeah. So with respect to trailer we would be exclusively using the CFME device, and so either the grip tester or SFT-type device.

At airports there are two different types of reasons to measure friction. One I mentioned with regards to operational friction tester in the winter with wintertime conditions where that's your limiting factor from a friction perspective, and then there's the maintenance friction testing which is done in the summer usually with nothing on the pavement except for water film, and that's to kind of measure the

health and quality of the pavements.

And so for non-airport testing we've exclusively done the second type, the maintenance friction testing.

Q. Now, we know that -- if we go actually, Registrar, to overview document 6, image 71, please.

Paragraph 180, November 6, 2013, Vimy Henderson from Golder Associates contacted Tradewind through its website and she asked to speak to someone about Hamilton's request for friction testing on its urban highways that year. And had Tradewind ever worked with the City of Hamilton or Golder prior to this?

A. Not to my knowledge, and the fact that they are reaching out to us through our website is pretty indicative of that.

Q. Did you have any personal involvement in the arranging of the friction testing?

A. I did not.

Q. Okay. And Commissioner, just for good order, overview document 6, paragraphs 185 to 190 set out the arrangements between Tradewind and Golder that we've heard

about and then 191 and 195 set out the arrangements between Golder and the City with the testing itself taking place on November 20th, 2013 at paragraph 196, and the inquiry has already heard, of course, from Dr. Uzarowski and Dr. Henderson with respect to those arrangements.

Now, if we could go to images 77 and 78, Registrar.

And it's paragraph 196 which, as I have indicated, the friction testing took place on November 20th, 2013.

Now, could you tell us who Michael Hogarth is? I understand he's a field testing technician.

A. Yes. At the time he would have been a primary field testing technician for friction measurement.

Q. And did he operate the grip tester on the testing on November 20th, 2013?

A. Affirmative.

Q. And when you say he was the primary field testing technician, did he operate the equipment?

A. Yes.

Q. All right. And just the

grip tester or all of your equipment at the time?

A. The majority of our equipment at that time, yeah.

Q. And how long had Mr. Hogarth been with Tradewind?

A. At that time, 2013, had to be at least 10 years, if not a dozen.

Q. And is he still at Tradewind?

A. He is not.

Q. When did he leave?

A. He resigned I believe it was 2018.

Q. Do you have any knowledge of anyone from the City or Golder who attended at the friction testing on the day it occurred?

A. I really don't have any personal knowledge of that, no.

Q. Who did Tradewind view as its client for this project?

A. Golder.

Q. Are you aware of any direct communication between Tradewind and the City of Hamilton?

A. I am not.

Q. So to your knowledge was all Tradewind communications with Golder?

A. Yes.

Q. On page 78, paragraph 198, you see that on November 21st, the day following the testing, that the reference to Mr. Taylor there is to Leonard Taylor and Mr. Hogarth wrote what's set out. However, I can tell you that the -- this actual -- the document refers to only Mr. Taylor but it was to you as well. And it's about the friction testing the prior day.

And actually if we can go to the actual document. It's TRW71. There we go.

So we can see that the originating e-mail on the 21st Mr. Hogarth wrote to you and then the exchange is also with the -- between Leonard Taylor and Mike Hogarth. Do you see that?

A. Yes.

Q. Okay. And then your father after receiving the e-mail from -- if you could expand the top one, please, so we can read it:

"Mike, thanks for the date and

update regarding the Hamilton area road testing. Rowan and I will work through the measurement results and let you know if we need further information to put together the analysis and summary report. I agree that testing crosswalks would take a completely different setup. Glad to hear the GTO81 seems to be still working okay."

And if you could then take that down.

Is this -- could you tell us before we get into the specifics of the testing and Mr. Hogarth's e-mail to you, how back at that time you and your father and Mr. Hogarth divided the responsibilities with respect to the testing and the test data, processing it, getting it into a report.

A. Absolutely. So at the time, like I mentioned, the vast majority collection would have been performed by Mr. Hogarth, and following the data collection,

usually within 24, 48 hours he would e-mail a summary to both myself and Mr. Leonard Taylor of the results and some of what I call metadata -- time, date, temperature, equipment number, that kind of thing -- and then it would go into a queue for processing on my end. I was responsible for really all of the data processing before it would then continue up to Mr. Leonard Taylor for the analysis and final report creation.

Q. So Mr. Hogarth would collect the data, provide it to you and your father, and then you would take data and you process it; is that right?

A. Correct.

Q. The graph and charts that appear in the reports, was that your remit?

A. Yes.

Q. And then based on that, once it's put together, your father would do the interpretation and would he write the report itself?

A. Yes.

Q. And did that division of work between you and your father evolve at some point over the years prior to your taking over

general operation of the business?

A. It did. I began to do at least first pass analysis on the I would say smaller or more clear results, leading up to present day where I do the analysis on all of them.

Q. At that time though it's as you described it?

A. Yes.

Q. Thank you. And you've indicated that Tradewind mostly is -- business in terms of friction testing and so forth is airports and then friction testing of airport runways. How is interpreting data from airport runways different from or similar to interpreting friction test data from roadways?

A. That is a very interesting question. The data is the data is the data, so -- and measured with the same test conditions using the same device with usually the same operator, so I suppose it's really more in the analysis, what you're comparing it to, what standards, if any, you are comparing it to. Do you have historical data to compare patterns, and do you have knowledge of types of activities or

processes that can reduce or increase friction on a roadway versus a runway, for instance.

Q. For highway runways -- sorry, airport runways, are there standards to apply the friction test results to?

A. Yes, there are Transport Canada standards for runways in Canada, FAA standards in the U.S., and IKO standards in Europe.

Q. It just depends on the jurisdiction?

A. It does.

Q. And for the airport friction testing, is this something that's done over a period of years or one-off? How does that work?

A. Yes. So as per Transport Canada advisory circular 3012-017 issue 3, the frequency and timing of measurement is actually dictated largely by the results of the previous friction test series. So it's broken down into ranges, and then also things like traffic are factored in. And so in Canada friction measurement has to be conducted for airports with regularly scheduled passenger traffic at a minimum

frequence of every second year, ranging to yearly, ranging to actual monthly in the case of poorer results.

Q. And so there's differences in interpretation as you said. Did your father feel comfortable with his ability to properly interpret and analyze results from grip tester roadway testing?

A. The results absolutely, yes.

Q. How many -- if you can estimate, how many roadway test results do you think that you have been involved with personally?

A. I would think it would be less than five.

Q. Now that your father is no longer actively involved in the business do you anticipate Tradewind will be doing further roadway friction testing and analysis?

A. Never say never, but I doubt it's in the cards.

Q. Why is that?

A. Largely because we're blessed with enough work in the airport domains to keep us occupied.

Q. So you described how many you were involved with. Did your father have more involvement with roadway testing than you had?

A. He might done a couple more earlier.

Q. So you're talking about prior to your involvement in the business?

A. Yeah, yeah. And we have been conducting friction testing in one way or another for about 42 years, so done a few things along the way.

Q. So it's fair that prior to your involvement you're aware that your father had done -- involved with roadway testing but you're not sure of the number?

A. Yeah, and it could be zero.

Q. Now, if we could get back to Mr. Hogarth's e-mail, which is still up on the screen. If you could expand the bottom e-mail there. Thank you.

So this is an e-mail on the 13th of November -- sorry, 21st of November, 2013. And I think you had indicated that Mr. Hogarth typically would set out in his summary e-mails

the -- some of the information about the testing condition; is that right?

A. That is correct.

Q. So that's what we see at the top, "weather clear, 7 degrees, wind calm." GTO81, that's the grip tester?

A. That's the serial number of the Tradewind-owned grip tester, yeah.

Q. Okay. And 50 kilometre an hour testing, that's the test speed?

A. Yeah.

Q. And then water flow 10.4 LPM?

A. Litres per minute which would equate to a 0.25-millimetre depth.

Q. Okay. So he writes: "Tested 17 kilometres of Lincoln Alexander Parkway LINC and Red Hill Valley Parkway starting at the west end at the overpass of Golf Links Road and finishing at the east end at Barton Street exit. Red Hill Valley Parkway is the pavement of concern, and has

the lower friction values. Tested three 400-metre sections of off/on ramp. Tested four crosswalks at 100 metres. Data very inconclusive as I could not tell you where the test wheel crossed the paint and it is not obvious by the graph. Those need to be tested properly, with the appropriate device. The one conclusion is that the paint friction is not radically different from the asphalt. The concern with the crosswalks is that a school crossing guard saw two kids slip and fall on a rainy day shortly after the crosswalks were paints, and registered a complaint." (As read)

So the last really five I guess sentences there are about crosswalks but -- so prior to that we know that Mr. Hogarth tested the LINC and the Red Hill Valley Parkway as well

as three 400-metre ramp sections, right?

A. Yes.

Q. In the fourth line he wrote:

"Red Hill Valley Parkway is the pavement of concern and has the lower friction values."

Do you know if someone mentioned a concern about the Red Hill Valley Parkway to Mr. Hogarth?

A. I mean, I don't personally know that, but it certainly reads that way.

Q. You didn't have any further conversation with Mr. Hogarth about this?

A. No, not that I recall.

Q. Was this a usual or unusual sort of summary e-mail by Mr. Hogarth?

A. Relatively usual. I mean, he's providing field notes, metadata for the testing and anything learned on site or deemed pertinent to the testing.

Q. And what sort of results would he typically flag? Like, there's certain

things that he mentions here, so what sort of things would he typically --

A. Yeah, so typically he would be flagging results that are lower and/or surprisingly low, especially for airports. And that might encourage us to process the data on a more priority basis, but yeah, really it's just a good capture of the things that are learned or seen in the field at the time by the only person who is actually in the field. You know, the rest is just data files in Excel.

Q. Would he typically report if there were difficulties with the testing or --

A. Absolutely yes. If there were mechanical issues or even if parts need to be replaced prior to or during the testing or if there were any calibration problems.

Q. Okay. And so if there was something that he was concerned affected the reliability of the results?

A. That would have been reported, yes.

Q. Here on the crosswalks he seems to be noting issues with that?

A. Exactly. He's basically

saying it's not possible to test -- and that makes sense. It's far too short a section to test. There are actually other instruments that can be used for shorter, you know, via pushing instead of towing at 50 kilometres per hour.

Q. And then we know it wasn't until late January that Tradewind provided the results and the Tradewind report itself. Is that a typical time lag between testing and reporting or was there something going on at the time that impacted timing of the report?

A. That is a pretty typical lag of about eight weeks or so. We conduct tests at many as 50 or 60 airports in Canada across the summer months, so the backlog of analysis reporting becomes quite real. And yeah, especially at test the end of November, yeah, eight weeks is totally believable and normal.

Q. Do you recall when you first saw the test -- the actual test data? You know, we get into January and we will look at some e-mails and so forth in January and a draft report. Do you recall when you first starred looking at the data and putting it into the draft?

A. I don't specifically

recall but it certainly looks like it was around January.

Q. And then if we could go, Registrar, to TRW92. And actually native format for that, please.

This is referred to in overview document 6, paragraph 229. And this is very small, we'll expand it, but this is, as I understand it, the test data, and maybe you can describe what -- it's an Excel document with a number of tabs and just explain what this document is.

A. Absolutely, yes. So the raw data is -- we load into a proprietary software which then produces textual summary which is what we're seeing here on this raw tab. So then those textual summaries of the data runs are simply copied and pasted into this -- the raw tab just in sequence, and you are seeing basically all the metadata, so date, time, surface name, centre, side, length of test, units, jurisdiction, all that good stuff, serial number, test tire, any operator's messages which are collected immediately following the completion of the test run. And then of course further down you get into

the actual measurement values of speed and grip number along with distance.

Q. Okay. So we'll look at it, but as I've read this what it does is for each test run, whether it be the lanes or the ramps or --

(Speaker overlap)

Q. There's a separate section as you go down and then it sets out results for each of those; is that right?

A. That is correct. Exactly. Each of those test sections is coming from an individual data file, a run file.

Q. And so at the top here in row 2 there's the date, 20 November, '13, and the time, 10:54. So is that the time of what, the start test run?

A. That would be the data and time at the start of the test run as programmed into the test computer at the time. And we work in airports so a lot of time we work in Zulu time so you don't necessarily know the time zone it's in.

Q. Sorry, Zulu time?

A. UTC.

Q. UTC. Got it. 10:54, is that 10:54 a.m. Eastern Standard?

A. There's actually no way to know. It's likely either 10:54 Eastern or 10:54 a.m. Zulu, yeah. Or in the afternoon.

Q. All right. And so is this -- appreciating that each individual test is going to be done at a different location, different date and time, is this the typical way in which the information is generated and placed into the spreadsheet?

A. Yeah, completely typical.

Q. And this first tab is titled "Raw" and then we've got additional tabs which are "Final" and then -- which we will go to briefly, but are those ones that are then pro--

A. Yeah, some sort of processing or even not processing, just arrangement has been done in the other tabs and then of course the graph is prepared based on that.

Q. Okay. And here I see at number 5 it says surface -- row 5 under surface it says "LINC east RT lane." Is that LINC eastbound right lane?

A. That certainly is how I would interpret it, yes.

Q. And in row 28 it states -- if you could maybe expand from row 28 down to the bottom of the page there, Registrar. If you could expand it from operator message at row 28. Are you able to do that? No, you got -- I see that's fine. Thank you.

So we've got the operator message and then row 30 it says LINC eastbound right lane right wheel path. So is that -- did I understand you correctly that that's Mr. Hogarth inputting that information at the time of the testing?

A. Correct. At the time that the test run is completed the operator is presented with the opportunity to enter in a comment, in this case indicating where, what was being tested is very helpful. What's the length of this test run? Is this full 17?

Q. Yeah, so just before we do that, I see that the columns are off, but it gives the distance.

A. Yeah.

Q. So it's measuring at

100-metre intervals?

A. Yeah, these are 100-metre averages is what we're seeing here, yeah.

Q. Right. The average within each segment because it's continuously measuring?

A. Yes, it is, yeah.

Q. And then I think if I've got it, because the columns seem to be off, there's the average speed column -- and actually one over from the average speed; is that right?

A. That is correct.

Q. And then average friction is the -- on the row 39, if we take the very top row, so the speed is 56 on the top row, row 39, and then 0.57, that's the grip reading?

A. Affirmative.

Q. And then converted just to 57?

A. Yeah, friction is a dimensionless number and, you know, often represented one or both ways, either a value from zero to 1 or zero to 100.

Q. Okay. And then if we scroll down, Registrar. Keep going.

This is the entire, for that lane, 1700 metres. There we go. So stop there, please, Registrar.

And then it gives an overall average of -- and then 51 I think, is that the speed again --

(Speaker overlap)

Q. And then 0.5 is the overall average grip number?

A. 0.45, yeah.

Q. For the entire stretch. And that includes here the LINC and the Red Hill Valley Parkway as one continuous test run; is that right?

A. My understanding is that those two roads kind of are the same stretch of pavement. So yes, for the entire 17 kilometre test section.

Q. And then this repeats for each of the lanes tested, which we won't go through each of them because the data is then presented later in the report.

If we could, Registrar, scroll down to row 1208. Way down.

It goes through there's

crosswalk data and 1208 is when we get to the ramps. And actually a little above there to see the -- okay, there we go.

So 1182 gives the same date and a later time of 1639, and then row 1185 says surface Greenhill off, then 1188, set test and actual run 400 metres.

And then down below -- now, if we go to 1208, and if you could scroll down a bit so we can see the results there, Registrar. There's the operator message, "Grenhill off ramp right wheel path" (as read).

A. Yes.

Q. So again Mr. Hogarth is entering that?

A. Yes.

Q. And then it gives the average values there again in 100-metre increments?

A. Correct.

Q. I see on the right-hand side the results are per 100 metres 51, 48, 68 and 77 in column E?

A. Yes.

Q. Okay. Now, if we could

go to row -- scroll down a bit to row 1299. A bit above that as well. That's fine.

This one says again at 1273, same date, 5 p.m. or 1700 hours, and then in row 1276 it says "surface Stone Church off" and gives the same sort of information down there below about the tire and the machine and so forth.

Then under "operator message" it says -- in row 1299 is operator message and in row 1301 it say "Stone Church off ramp right wheel path Red Hill Valley Parkway mix." Again that's Mr. Hogarth?

A. That is correct.

Q. And if we can scroll down a little bit to see the average values. Again there's 100 metre increments for a total of 400 metres and four readings; is that right?

A. Yes.

Q. The readings from the 100 through 400 is 38, 40, 33 and 39. And we heard yesterday from Dr. Ludomir Uzarowski that likely this particular ramp was at the Mud Street interchange, the Stone Church off ramp, and that that was where a test strip using the same surface course for the main line Red Hill Valley Parkway

had been placed.

First of all, do you have any personal knowledge of that one way or another?

A. I do not have any personal knowledge of that.

Q. Okay. And nonetheless, based on what's written here, are you able to interpret what Mr. Hogarth saying and give us your understanding?

A. Yeah, I think with a reasonable degree of certainty looking at this and then looking at a map of the roads in the area, that the Stone Church off ramp would be the one that curves around and heads south to Stone Church Road as opposed to the one that heads more eastbound, so Mud Road or something like that.

Q. If we can go to -- keep this up, Registrar, so we don't lose it. And then pull up RHV930. This is Exhibit 22. It's this -- this where the LINC ends up into the -- north into the Red Hill Valley Parkway. If you are going from the left, part of the image is west and then it arcs up north from the Red Hill Valley Parkway.

And then there's the red image there, and then at the bottom, the road that's

running at the bottom of the image east-west -- more or less east-west there, is Stone Church Road, and Dr. Uzarowski indicated it is likely that the testing from his understanding took place on the off ramp that's marked in red. Is that the one you were talking about there?

A. Yeah, that from my understanding is also likely the same one. It's possible it's the other sort of off ramp or exit, but there it says Lincoln Alexander Parkway as well heading eastbound. But then I don't know why he would cut it to only 400 metres, so presumably some direction on-site was given.

Q. And then Stone Church is on the bottom?

A. That's the other thing too. So yeah.

Q. You can take that down. If we can just go back to the spreadsheet there or the Excel sheet, TRW92. And if we can go to -- just back up a little bit. That's good. Thank you. A little further, up to the next one. There. Thank you.

And this is for the other ramp, again same date, 12, 27, or 20 November 2013

and says "surface Greenhill on," and then down at row 1253 operator message. And then row 1255 the operator message is:

"Greenhill on ramp right wheel path mix change at 260 metres. Last 140 metres same mix as Red Hill Valley Parkway."

And then if you could scroll down a little bit, Registrar. Thank you. So we can see the average values.

So again is that Mr. Hogarth's message that he wrote in at the time that the option is presented to him following the testing?

A. That is.

Q. And then under the average values it shows again 400 metres in 100 metre increments with results being in row E 60, 60, 52 and 42; is that right?

A. Yes. Yes.

Q. And did you ever discuss with Mr. Hogarth his notes and the source of the information for his notes?

A. I did not.

Q. Do you know based on his practices why he's -- if he's putting in a note

like that what he's doing and why?

A. Yeah, he would be trying to provide some context and/or just field notes. That is a pretty specific one talking about mix change at specific test length, so I guess either there's a sign that says mix changes here or it's also possible that the pavement was visually very different. Of course an older pavement is more grey than a newer one. Also reads to me like some information was given him at site.

Q. That's based, you assume, on his practices but not based on an actual discussion you have --

A. Correct, I have no firsthand knowledge in that regard.

Q. And if we can go to next at that point, Registrar, "final." If you just scroll up to the top.

And as I understand it these are, and correct me if I'm wrong, the results from the lanes and the -- each of the test runs and the ramps as they then later appear in the Tradewind report; is that right?

A. Yeah, this is the process and the organized data which is used in the

graphs.

Q. Okay. And in this instance -- and sorry, this is your work then?

A. This is my work, yes.

Q. So if you scroll down a bit there, Registrar. This has then been broken up into -- keep going. I'll let you know when. Thank you.

That's the first 10,000 metres. You've broken it up so it's the LINC portion is -- you've demarcated it, and the Red Hill Valley Parkway?

A. Yes, yes, we split the data into approximately I think 10 and 7 kilometres.

Q. And then named it the Lincoln Alexander for the first 10 and Red Hill Valley Parkway for the 7?

A. Yes. And of course, the data was collected, however, in the 17 kilometre continuous run.

Q. And that's what we looked at in the raw data tab?

A. Exactly.

Q. And then just briefly

then, the next six tabs, if we go to the next -- the third tab, there's a number of graphs that are visual representations of the data; is that right?

A. That is correct. So on the X axis we have the airport road we refer to as change (ph). It's just basically metres. In this case zero to 10,000. And on the Y axis we have the grip tester friction number (garbled audio) between zero and 100.

Q. And again this is your processing of the data?

A. It is.

Q. And then just go over to the next one. Again Lincoln Alexander Parkway westbound. Next one. Lincoln Alexander centre reference. And the centre reference is what?

A. My understanding is that's a measurement conducted at the centre of a lane as opposed to the wheel paths. On airport runways we do runs at different offsets from centre line, usually 3 metres where the narrow body traffic is, 6 metres with the wide bodies, and 15 metres for reference. But of course it's quite different on roads that track so much narrower.

Q. And then the next three are labelled as RHV, which are the Red Hill Valley Parkway segments, the 7 kilometre segment; is that right?

A. Exactly. The 10 to 17 kilometre marks.

Q. Okay. And then the next one, Registrar, and the next one. A centre reference as well. And for all of these pieces (ph) if your work plotting it into the graphs?

A. Affirmative.

Q. And this is what -- these graphs then appear in the final report; is that right?

A. Correct.

Q. Thank you. We can take that down, Registrar.

And there's communications between Golder and your father in December 2013 and then early to mid-January where Golder is asking about the timing of receiving the test results and so forth, but you appear on January 21st e-mailing a draft report to your father.

And if we can go to overview

document 6, image 87, please. And it's paragraph 228. 229, we looked at that, that's the spreadsheet containing the friction data that is referred to.

But at 228 you e-mail your father, Leonard Taylor, a draft friction survey summary report for testing done November 20th, 2013, and your covering e-mail read:

"Similar overall comments to the SDG one. As I showed you a while back, the 17 kilometre is split between two graphs into approximately 10/7KM sections corresponding to the Lincoln Alexander and Red Hill Valley Parkways, respectively. I put an extra pin in the GMap" -- is that Google Map?

A. Google map.

Q. "GMap to show this as well. Also note that this is a dual carriageway so I changed the UK ref line to 48."

So if we can go to Tradewind

TRW43 and -- that's the e-mail itself as well TRW43.0001, or might be just .1, which is the attachment.

So can you describe what this -- the document attached is a friction testing survey Summary Report Lincoln Alexander, Red Hill Valley Parkways, Hamilton. Can you describe what this is and how you got to that point?

A. Sure. So this is a amalgamation of the prepared data graphs and tables that we saw there on the Excel sheet added to some kind of baseline Word report template. Looks like we had done another series not too long before --

Q. Sorry, another series?

A. Another road test series not too long before that this was based off of. As you can see it leaves a few things to be entered.

(Speaker overlap)

Q. You're right. And we'll get to that, but just generally speaking what are you doing to put this together --

A. So the data, the graphs, the tables, and then summary information as well,

if there's summary tables in the text. And in a best case scenario we've got a report we have all the standards in and everything like that as well. I'm handing that off for the analysis on Mr. Leonard Taylor's side.

Q. And if go to image 2 of the document on the right. Thank you. And so it's in the first paragraph it does refer to the Lincoln Alexander and Red Hill Valley Parkways in Hamilton, but then it goes on and seems to be talking about something completely different?

A. Correct.

Q. That's a different project?

A. Yes.

Q. And --

A. More a template than a draft I guess.

Q. Okay. That's the thing is you're taking this from another document and modifying it; is that right?

A. Yes.

Q. And I think next someone talking about aircraft -- airport testing; is that right?

A. Yes.

Q. Second paragraph. If we can go to image 3. Under the title "Friction Measurement Results" there's -- the first paragraph refers to the crosswalks and is that what you wrote specific to this project?

A. Yes.

Q. And then after that, though it seems to then be again talking about runways; is that right?

A. It does look that way, yes.

Q. Again, is that from the prior template document?

A. Yeah, looking at this I think it was coming from two, if not three, other documents just kind of getting squished together as the basis.

Q. And then image 4, and on that it appears it starts off on that page talking about, if I've got it right, an airport runway, but then it's talking about roads in York region; is that right?

A. It does appear that way, yes.

Q. And it talks about intersections like Green Lane and Woodbine, Davis and Leslie. And is that what you're talking about, about the sort of amalgam of prior documents?

A. Yes, I don't even recognize those road names.

Q. Is that perhaps a project you weren't involved in?

A. It could be, yeah.

Q. Well, in your e-mail to your father on the left you did write "similar overall comments to the SDG one." What's SDG, do you know?

A. I believe that's Stormont Dundas Glengarry, if I recall correctly.

Q. Is that a different road report?

A. Yeah, I think so. I don't think that's in York region.

Q. I agree. You don't recall specifically, but that's what it refers to; is that right?

A. Yeah.

Q. Okay. But again that's

not an airport project; is that right?

A. No.

Q. And then in your e-mail you referred to about splitting up the Lincoln Alexander and the Red Hill Valley Parkway. You said I put an extra pin on the Google map to show this as well.

So if we could jump forward, Registrar, to image 12.

The first figure 1 is the image of the grip tester. And then if we could expand figure 2, please. And I see there's three pins. There is A at the far left and C at the upper right, which are at the ends of the purple section, and then in the bottom there there's a pin B. So can you tell us what you are describing in your e-mail.

A. Yeah, so I believe we're looking at actual the A to C is a 17 kilometre stretch as measured by our friends at Google, and then with B demarcating the 10 kilometre, 7 kilometre division and I believe this largely lines up with the operator's notes as well. Runways of course are a lot easier to explain where the ends are so I'm trying to add a little

bit of a visual to this one.

Q. And the pin B, that's around Pritchard Road. Doesn't quite show on there.

A. Yes.

Q. Is that right?

A. Yeah.

Q. And then in the far west, the LINC portion that's -- is that at Mohawk Road where it crosses the LINC; is that right?

A. Can't quite see -- yeah, okay. Yeah, appears to be, yeah.

Q. And then in the far north the Red Hill portion, that ends at Barton Street?

A. Yes.

Q. Right. And do you recall what the basis was for dividing them between the Red Hill and the LINC in that particular location?

A. I don't specifically recall, but I would assume there was something in the operator's notes or the covering e-mail that would have guided on that front.

Q. If we can go to image 14. Take that down, Registrar. Appendix 1. This also appears in the final report, right?

A. Correct.

Q. This is a chart showing appendix 1 "Reference Grip Number Data For Roads: UK Investigatory Skidding Resistance Levels (Risk Rating) For Different Categories of Site."

Where did you derive this from and on what basis?

A. So on the practical matter this would have been copied and pasted from a previous report. I've come to understand that the original source is UK publication UKPMS I think. More specifically HD28/94 is where this particular table originates from.

Q. Okay.

A. And here in the bottom it says "it's courtesy of Findlay Irvine," which is the grip tester manufacturer.

Q. Right. And sorry, so you said you would have copied and pasted it from a prior report?

A. Correct.

Q. And at that the time did you have any personal knowledge of the origins and use of that particular chart aside from taking it from a prior report?

A. The origins no; I mean, the use is somewhat self-explanatory.

Q. And was that -- using this one, was that on your own initiative or your father's instructions or do you recall?

A. I do not specifically recall but I would imagine there was a discussion about making that table available in the report.

Q. And then if we could go the next image, 15. Do you see at images 15 through 18, we will scroll to them in a second, but am I correct that this is what we looked at in the second tab on the Excel sheets?

A. It should be identical.

Q. This one is -- the road is Lincoln Alexander Parkway. It shows on the first page the -- if you can just expand the top part there, Registrar, with the first few lines. It's a little hard to read. Thank you.

And so it gives the chain edge on the left side in 100-metre increments and by column lists each of the lane measurements.

A. Yeah. Those would be the right lane, left lane eastbound, and then coming back westbound and centre reference. Yeah.

Q. Yeah, the eastbound R, is that the right hand, the outside lane?

A. Yeah, that would be the right hand, the outside lane.

Q. And L is the left hand or inside lane.

A. (No response.)

Q. And is this a -- appreciating there could be different number lanes and so forth, but is this a typical way of representing the results in the report?

A. Absolutely yes.

Q. Same with runways?

A. Yes, other than instead of lanes we're dealing with just offsets.

Q. Okay. And you can take that down, Registrar, and go on to the next page.

And here it goes to the 10,000 metres. That's the end of the LINC portion; right?

A. Hm-hmm.

Q. Sorry, is that yes?

A. Sorry. Affirmative.

Q. It gives a low at the bottom there -- if you can expand that,

Registrar -- low 100-metre section and then it gives the -- for each lane, and then it says runway average.

A. Yes, so the low 100-metre section is also coming from runways. There's actually different levels requiring corrective action for the runway average as a whole and for 100-metre sections. And with regards to runways, that's usually because of concerns about rubber buildup in the touchdown and threshold areas.

Q. I see.

A. In this case yes, runway average means road average.

Q. You can take that down, Registrar. And there aren't any landmarks or anything noted on here, and so -- right. And so is the way -- how does one ascertain the specific location of each 100-metre reading?

A. Good question. So especially on a 17 kilometre test run such as this, I mean, it's reasonable to assume that things can be shifted a couple metres one way or the other so really you have to just go by the start point of the tests and go from there.

Q. Okay. Sorry, so when you

say it can be shifted by a couple hundred metres one way or the other, sorry, what do you mean by that?

A. Oh, like over the entire length of the 17 kilometre test section, especially when you're doing four different lanes, you know, the start position could easily be a hundred metres off coming back the other way, for instance. So all this to say it's not a super exact location for the individual 100 metre averages but nor are they completely inaccurate.

Q. So just to back up, I guess it depends on what the exact starting point is?

A. Yes. Of the run. Of each individual run.

Q. And just why would they be at different locations, the starting points?

A. Just due the dynamic nature of the testing, getting up to speed, getting the water film applied. I don't know what the arrangements were for a safety escort and things during the time of this testing, but that's usually a factor as well.

Q. And so the pin B that we

looked at before that you put in the Google map, is that an exact location or demarcation of the -- for each lane?

A. I would say it's not a super exact demarcation. It could easily be a few hundred metres or a couple hundred metres. I don't even know officially what the demarcation point is on those two.

Q. Right, the actual --

A. (Speaker overlap) it's one road, right. I don't know where the border is.

Q. Okay. If we can go to next image. These are also again the charts that appear in the final report?

A. Affirmative.

Q. And this one then at image 17 is the Red Hill Valley Parkway portion of it?

A. Yep.

Q. 7 kilometres. And it has the same -- lanes are set out in the same way, same manner?

A. Yes.

Q. And as I understand it,

the eastbound is -- because of course the highway does change, that's with the starting point being on the LINC it's running east and then goes north onto the Red Hill, right?

A. Yes.

Q. And relatively westbound for the Red Hill is certainly westbound on the LINC, but when you look at it on a map it's primarily southbound on the Red Hill?

A. Yes. So this would all be referenced. The data would have been arranged in a way, so the beginning point is always on the LINC and on the west end of the LINC, and the ending point is always on the north end of the RHVP.

Q. Right. And when we were looking at the raw data it was calculated in the basis of one test run?

A. Exactly. In the direction of measurement. And certainly with roads people appreciate if you go in the direction of travel.

Q. Right. Take that down, Registrar, and then just go to the next page. Expand the bottom bit. Thank you.

Then the same low 100 metre section for each lane and the runway average which, as you mentioned, is the lane average.

A. Affirmative.

Q. Take that down, please. If we go, Registrar, to overview document 6, image 87.

This is -- I just want to place something in time before we get on to another topic. So in paragraphs 230 and 231, these are e-mails from Dr. Uzarowski of Golder on January 24th, 2014, to your father Len Taylor asking for the friction testing results and indicating that his client needs a comparison of friction numbers on the Red Hill Valley Parkway in Hamilton from 2007 and 2013:

"I have summarized 2007 and need the numbers for 2013. He needs my summary before noon. Could you send 2013 numbers to me."

And then if we could just go to image 93 at paragraph 243. If you expand for us registrar.

Mr. Taylor, which again refers

to your father, on January 26th, two days later, and this is a Sunday, January 26th, 2014, he writes to Dr. Uzarowski. And this is just after he had sent him the Tradewind report earlier that day, and he says:

> "As you will have noted, the data analysis and report for this project has now been completed. I am sorry for the delays in getting this to you and trust that the summary numbers that were given to you by Rowan on Friday were sufficient for your meeting."

Now, take that down, Registrar, and go back to 88, 89. This is back to January 24th at 11:44 a.m. So after the two earlier e-mails that I took you to to your father requesting the information, Dr. Uzarowski e-mails Mr. Gary Moore at the City of Hamilton under the subject line "friction numbers on RHVP."

If we can expand e-mail itself on the two pages, please, Registrar. And again you're not copied on this. It's just to place it in time for you.

You'll see in the bottom of the first expansion there he's writing about that the friction numbers -- in 2013 the friction numbers were measured on the RHVP in both directions and he gives them the numbers by lane.

So do you recall having a discussion with Dr. Uzarowski and providing him with numbers from the Tradewind friction testing?

A. I do not specifically recall that, but looking at the e-mails around that time I don't really see how he could have gotten the numbers any other way.

Q. Okay. And your dad referred you to having made that --

A. Exactly.

Q. Okay. So you don't have any specific -- you actually don't recall it but --

A. I don't, but it's pretty reasonable to assume looking at the --

Q. All right. Did you ever meet Dr. Uzarowski?

A. I believe we met at some trade shows or conferences over the years.

Q. In providing the numbers

to him what would you have told him? Would you have provided any interpretation on it?

A. Definitely no interpretation, and that's -- I mean numbers, they are the averages but that's leaving out a lot of context. So it is somewhat surprising as well that I would have communicated or would have agreed to communicate but....

Q. But if your father asked you to, you would have done so; right?

A. Exactly. And judging by the urgency of Ludomir's e-mails I wonder if that might have played a role.

Q. Okay. And when you say that it's leaving out a lot of context with the averages, what do you mean by that?

A. I mean everything, right; the test date, the equipment, the locations, the division of the lanes, the minimums, the comparison with the LINC, everything. Just the averages.

Q. Right. And just in terms of the lanes themselves, Dr. Uzarowski refers to them as southbound and northbound and we were just talking about it. Do you have any insight as to

what information you would have provided to him about the lanes themselves?

A. I mean, I guess is he referring specifically to the RHVP portion test data?

Q. Yes.

A. And do those averages agree with those in the tables of the reports.

Q. Well, here's the thing, it turns out that they are reversed so what's southbound actually should be northbound.

A. Oh, geez.

Q. Yeah. So I appreciate you don't recall the conversation, but do you have any insight into how you would have communicated the information to him?

A. I mean, I don't think we use southbound and northbound language in the report or the table so I think it would be more likely to have been communicated in terms of right lane, right wheel, left lane, right wheel.

Q. But again you don't have a specific --

A. I do not. I do not.

Q. And also he reports it as

average FN numbers. Is that how you would have reported them to him? Is that your kind of language?

A. I believe I would have been more likely to use GN or grip number or just the generic friction. These acronyms, ways of talking about friction can mean slightly different things depending on the context.

Q. And in his e-mail to Mr. Moore, Dr. Uzarowski refers to friction testing having been conducted by the MTO on the Red Hill in 2007. Did you have any knowledge at the time of that?

A. I did not.

Q. And we know that the MTO used an ASTM locked-wheel tester device at the time, which I briefly mentioned to you, and which I take it from your answer earlier you do have some familiarity with?

A. I'm aware of it in name. Definitely heard about it, but nothing beyond that.

Q. From your experience do you have any knowledge or understanding of how -- the correlation of results between different

measuring devices?

A. Right. How deep do you want me to go?

Q. Not too deep. I just want to know what your experience is. Like, for example, between different measures devices that Tradewind uses.

A. Right. So between, for instance, the grip tester and an SFT (ph) device that correlation is actually very good, and that's why Transport Canada allows either to be used in reference to the standards.

But they use very similar overall test methodologies in terms of the fix (ph) slip ratio and even there is some dimensional sizing between the size of the test tire versus the speed of test and water film depth.

More broadly, correlating different test methodologies or equipment types is quite challenging. There are a huge number of variables at play, from the trivial like air temperature and road temperature, but through test tire composition, water film depth, load on drag on the test wheel, whether it's a fixed slip or locked wheel tester type test. Yeah, there's a

lot that goes into it -- as I'm sure you and everyone are aware, friction is, unlike mass, not an absolute property, right. It's a property of the interaction between two surfaces in motion and any contaminant or lubricant in between them. So the measurements are very much real, but the way those measurements are conducted is a big part of it.

Q. And just in Tradewind's practices with airports, for example, did you switch devices when you're doing the periodic testing over time? Do you use the same device or do you switch devices?

A. In general we try to use the same device or at least same device type for historical patterns. That being said, we've certainly done some tests where we would alternate between a grip tester and an SFT-type device and we're confident in the comparability between those two devices.

Q. Okay.

A. But going from something like a fixed -- a locked-wheel tester to a CFME would be a very different ball game from a comparison point of view.

Q. Okay. If we take that down, Registrar. If we can go to image 91. And paragraph 240, as indicated it was on January 26th, 2014 -- thank you, Registrar -- Len Taylor e-mailed Golder, Mr. Henderson and Dr. Uzarowski, providing the final Tradewind report.

And an introductory first paragraph, and an apology for the delay in the last paragraph. In the middle paragraph he says:

"You will note that while the average grip number friction levels were generally uniform and comparable to or above the relevant reference levels on the Lincoln Alexander Parkway, those from the Red Hill Valley Parkway were considerably below the reference levels and less consistent?"

And before getting into the specifics of that, this is consistent with your father's practice to provide a summary when he provided a report to a client?

A. Yes, just a high level

sort of key takeaway or abstract, if you will.

Q. What would he typically include in his summary or abstract? Like when you say key takeaway, what do you mean?

A. Yeah, the key takeaway I suppose in this kind of testing is the measured results as compared to the relevant standards.

Q. And were you aware, was there any confidentiality restrictions placed on the report by Tradewind?

A. Not explicitly, but in the business-to-business world I mean everything is commercial in confidence, not to be widely distributed. There is nothing specifically on the report.

Q. Right. Well, that is sort from your perspective, right, you wouldn't do that, but in terms of the client were there any restrictions placed on it?

A. Not -- certainly not in writing. Would have been our assumption that it wouldn't be shared widely but --

Q. By shared widely you mean what, like --

A. Like publicly for

instance.

Q. But there was no contractual requirement or anything like that?

A. No, there was not.

Q. And having -- you know, you were involved and crunched the numbers and assisted with the preparation of the report. Do you think your father's summary, does it capture the essence of the report? Is that what you see as the key takeaways?

A. Definitely, yes, especially here where we have two sections of roadway being tested on the same day by the same operator with the same equipment under the same test conditions and yielding quite different results, I think that's a really good highlight.

Q. At the same time the results tell you that the Red Hill and the LINC are different but not why they are different?

A. That is correct.

Q. And at the time of the report were you aware that the LINC had been resurfaced in 2011 whereas the Red Hill had not been and had been originally paved in 2007?

A. No, I don't think I was

aware of the status of the pavement.

Q. Do you have any knowledge of whether your father was?

A. If he did know it would have likely shown up in the report. That's certainly something we highlight in the airport reports.

Q. If there had been --

(Speaker overlap)

A. If there had been remediation, repaving, rehabilitation, yeah, that's generally something that comes into play.

Q. And the report, as we will -- when we go to that now at GOL1113. This is the final report. It's got -- is that the grip tester? Or a version of another machine?

A. That is a grip tester. I don't think that's our beloved 081 though.

Q. Is 081 still in service?

A. Absolutely.

Q. Why do you say it's beloved?

A. It's been around for a long time. Early '90s that one was procured.

Q. So they do last quite a

while?

A. They do. With regular maintenance and care and love.

Q. If we go to the second image, please. So you described your respective roles before. Who wrote the -- this is the final report -- who wrote the narrative in the report?

A. I mean, the 95 percent would have been Mr. Leonard Taylor. I think there was a couple of sentences that had come from my pre-draft.

Q. Right. The one that you sent before like --

A. Exactly.

Q. -- the reference to crosswalks?

A. Exactly. And the -- you know, where the testing was taking place in the first line there.

Q. Okay. And did you have any part in analyzing the results in this case?

A. Not beyond the table and graph preparation.

Q. And what about the recommendations?

A. Not whatsoever.
Q. Sorry, none whatsoever?
A. None whatsoever.
Q. Do you recall if you read the report before he sent it to Dr. Uzarowski?
A. Unlikely before he sent it, given that it was sent out a Sunday evening.
Q. And of course, as we've seen from the data, the testing is done at 50 kilometres per hour or a couple kilometres per hour --
A. And --
Q. And it references in the third last paragraph there the ASTM 1844 test --
A. Correct.
Q. And is that -- it specifies the size of the tire as well?
A. Yeah, so ASTM E1844 standard is for the test tire itself, the size, the composition, inflation pressure, and that's the tire used on the grip tester.
Q. Okay. And is that a smooth tire or a ribbed tire?
A. That is a smooth tread tire.

Q. Does that mean no tread?

A. No tread.

Q. If we can go to image 3, and if we could expand the middle paragraph that says -- first talking about the Lincoln Alexander Parkway and that the values in the outside lane test runs range from approximately 50 to 55 and on the inside lane test runs the values range from approximately 52 to 60, and again that all the readings were above the investigatory level of 48 that was applied. He refers to -- again this paragraph was written by your father as well as the rest of it, is that what you've described?

A. Correct.

Q. He refers to remarkable consistency of the LINC grip number values and that the narrow range in friction levels is notable for a single road surface of this length. Do you have any insight into that comment beyond what's written or is that based on your father's experience?

A. That would be based on his experience but, I mean, it is a narrow range for such a long test section of asphalt. There's no doubt about that.

Q. Take that down, Registrar, and pull up image 4 as well along with image 3. If we can go to -- expand bottom paragraph and then the top one of the other image -- bottom of the left image and first paragraph on the right, which are referring to the Red Hill Valley Parkway portion.

And your father is pointing out here that the Red Hill numbers were found to generally be well below the referenced investigatory level 2 of 48. And then says most of the length of this road had grip numbers in the range of 30 to 40. Only a short section, approximately 600 metres in length of the right-hand wheel track of the right-hand outside lanes near the southwest end of the parkway had friction levels above the UK investigatory level 2. Then refers to most of the results being between 30 and 40.

And then hold that down for one second. Or pull down, please. Expand the next paragraph that says "the data" in the paragraph on the right. And here it says:

"The data from all four test runs in the wheel path areas

of the Red Hill Valley Parkway was quite consistent when subdivided into 100 metre section values, but did show localized variations of 10 to 15 points over relatively short lengths."

Do you know that means? Because, I mean, you describe that the measurements are reported in 100-metre segments with the average of the results continuously taken over the 100 metres. But --

A. Yeah, so he's either talking about comparison between different 100 metre section varying between 10 and 15 points, like in a block in an area, or he could be referring to the underlying more granular data as well.

Q. And in your experience with the grip tester, what does variability of the results denote?

A. It can be a lot of different things. Contaminants, usually rubber, can cause great variability over short lengths. Also the construction of the pavement too, if

there was some different technique applied over different parts of it. You know, direction of paving even can play a role.

Q. And when you talk about contaminants and rubber, for example, is that based on your runway experience?

A. Yeah. So when we're talking about maintenance, friction testing and contaminants affecting the results, most time we're talking about rubber accumulation on runways in the thresholds and touchdown areas. But there are other contaminants that will show up from time to time; sand, dust, in a couple cases pollen actually -- pollen drop can significantly reduce measured friction results.

Q. Take that down, please.

And we see the bottom of the image on the right which is still image 4, -- if you can pull that up. I think it's cutting off a bit there, Registrar. Am I right or no? I think part of that same page cutting off.

A. It is for me as well.

Q. It looks like it's larger, if we go to the bottom of that page.

(DISCUSSION OFF THE RECORD).

BY MR. LEWIS:

Q. And actually I want image 4 and 5. There we go. Yeah, if you could expand that and then the top graph. Thank you.

So this is the ramps that we discussed earlier when we were looking at the raw data tab on the Excel sheet, and the operator comments by Mr. Hogarth. And so this is, I take it, your having collated that information into a chart that we saw on the draft.

A. Affirmative, yes.

Q. Okay. And they -- there's an explanation below. It discusses the investigatory level to apply to the ramps. But something that you said earlier was that -- I think -- without having your exact words -- was that, you know, if there's a difference in the pavement, typically that's something that your father would note. If there was different types of pavement, that sort of thing. Do you recall saying that? Like, you know, that the kind of thing that you would -- that if there was something that affected the results --

A. Oh, oh, oh. If there was knowledge of, for instance, repaving or

remediation, yes, yes.

Q. And so --

A. It's relevant, right, because it can perhaps partly explain results or the different -- difference in results.

Q. Right. And so what I'm wondering is we saw Mr. Hogarth's references in the operator comments there to the -- first, the Greenhill onramp with the last 140 metres indicating that it was the Red Hill main line, and for the Stone Church off ramp, his comments indicating in the operator's note that it was -- I don't have the exact wording, but that it was the Red Hill Valley mix as well for that portion, but there's no reference to that here?

A. No, I don't think there is.

Q. Okay.

A. So I don't know it was considered and left out or not considered.

Q. Okay. You can take that down, Registrar.

And, sorry, before I went on to that, I asked you about the variability of grip tester results, and you mentioned contaminants in

particular, but you also talked about construction of the pavement too or different techniques applied over different parts of it.

A. And wear as well is a big one both on runways and presumably roads as well.

Q. Sorry, the wear being?

A. Wear from traffic, from the weight of aircraft or vehicles actually polishing the surface.

Q. Right. Oh, so you mean the amount of traffic --

A. Yes.

Q. -- on a road or the -- for a runway the volume of --

A. Yes.

Q. -- aircraft?

A. Yes, absolutely. And, you know, the type of aggregate used in the asphalt, how hard it is affects the wear rate as well. We've seen some runways that become polished like a marble countertop from the wear because the aggregate is soft.

Q. Okay. If we could go to image 6, and actually 6 and 7. Why don't we pull them both up.

So these are sort of iterations of the same graph that we looked at on the Excel sheets; is that right?

A. Yes. So this is right lane, right wheel, left lane, left wheel for the two. Yeah, yeah, so this is a -- two continuous test runs then divided.

Q. Right. So this is -- when you say "continuous," so if you start on the left, that's going from the far western end of the LINC --

A. Western end.

Q. -- all the way through, then, on the right image to the red -- the demarcation point that you indicated between the Red Hill and the LINC, and then on the right image is the continuation on the Red Hill; is that right?

A. Correct.

Q. Okay.

A. And for both of these the definition measurement would have been in that direction as well, yeah, because we're doing eastbound, yeah.

Q. Right. Eastbound and

then northbound.

A. Yeah. I can see the confusion.

Q. Okay. And then there we see on the right-hand image, that's the -- what's referred to in the report as the 5- to 600 metres of the Red Hill portion?

A. Hm-mmm.

Q. -- on the outside lane that what's similar to the LINC values?

A. It's quite striking that particular one because, yes, it certainly looks more like a continuation of the LINC surface as compared to the left lane one.

Q. Right. And that's -- again, you don't know what the surface pavement was or the surface mix, but that's something you infer from the results; is that right?

A. That would be reasonable to infer from these results, yes.

Q. Okay. And then if we could pull up images 8 and 9.

And so this is the westbound readings for both lanes, right?

A. That is westbound

exactly. So in this case -- well, south and westbound, so they would have been --

Q. South and westbound.

A. -- recorded from the 17-kilometre mark towards the zero mark.

Q. Okay. And so in that respect they would have started at the northern portion of the -- or far eastern portion, but the northern portion of the Red Hill Valley Parkway and then on to the LINC; is that right?

A. I mean, I don't know 100 percent, but that's very logical to assume.

Q. Okay.

A. Otherwise I suppose they would have had to close the road.

Q. Right. And again, the same continuous reading between the two?

A. Yes.

Q. Okay. And -- then again, we see the -- on the right-hand image we see the approximately 600 metres at the -- which are similar to the LINC readings, LINC portion readings and then dropping off after that?

A. Yes, yes, which is also the outer lane. There's also a bit of a steady

offset between the left and the right lane here too.

Q. Sorry, a steady offset?

A. Like about a 58-point offset between those two which is interesting as well.

Q. Sorry, do you mean in the -- on the --

A. Between the two lanes on the LINC.

Q. Right. And that can -- one is the outside lane -- the lower -- the right lane is the outside lane, right?

A. Yes.

Q. Which would typically have higher traffic volumes or is that something that you --

A. I mean, I can't really comment on that, but....

Q. Okay. Okay. And then image 10 and 11, can we pull those up.

And so this is the centre reference for, again, the LINC on the left and the Red Hill portions on the right. And again, is this the same continuous reading from left to

right?

A. This would be, yes. And I don't recall there -- I think it was mentioned there -- which lane it was conducted in. I believe it was on the outside lane.

So if we go to I believe -- we'll go back to it, but it says -- it's at image 4, it says that the grip tester measurements from the centre of lane reference test run on the outside lane.

A. Perfect.

Q. Which we know that. Okay.

A. So we're seeing that same approximately 600-metre section there.

Q. Right. On the outside lane?

A. Hm-hmm. Which is consistent with the right-hand wheel path of the right-hand lane as well.

Q. Right. And there -- yeah, the reference is there in the -- what the Registrar pulled off in the middle paragraph.

A. Perfect.

Q. Okay. Thank you. Okay.

And if we could go to image 14.

Is the same appendix 1 that we talked about from the draft, from the U.K. investigatory skidding resistance levels.

A. Yes, I believe it's unchanged.

Q. Right. And the grip number of 48, I think you had indicated that it was -- and the report indicates that it was for dual carriageway?

A. Yes, which is a very British term --

Q. Yes.

A. -- for divided highway.

Q. It is. What about motorway? What's the difference? Do you know? It gives the same rating. It gives the same --

A. I guess the motorway is the M-class roads.

Q. Okay. But is it -- from your reaction is it fair to say you're not sure?

A. I'm not really sure, no.

Q. Okay.

A. And presumably single carriageway is like a two-lane divided road.

Q. Right. Would you have gotten direction from your father on that? Do you know?

A. I might have.

Q. All right. And then just to go to images 15 and 16. Yeah, 15 and 16.

Very small, but these are the -- on these pages the Lincoln Alexander Parkway detailed results from the zero to 10,000 metres.

A. Okay.

Q. And again, these are the same ones we looked at earlier, is that right, in the draft?

A. Yes, I would imagine they're identical.

Q. And the next two images, Registrar. 17 and 18.

And this is the Red Hill, the correlative Red Hill portion from 10,000 to 1,700 metres.

A. Hm-hmm.

Q. If we could go back to image 13 and pull out the middle -- sorry, the first and second paragraphs. Yeah.

Conclusions and recommendations. Did you have any part in formulating the recommendation?

A. I did not.

Q. Okay. And did you have any discussion with your father about the recommendations that you recall?

A. Not to my recollection.

Q. Okay. And after setting out the results, in the last sentence there it says:

"We recommend a more detailed investigation be conducted and possible remedial action be considered to enhance surface texture and friction characteristics of the Red Hill Valley Parkway based on the friction measurements recorded in the current survey." (As read)

And do you know basis for his recommendation?

A. I would imagine the basis is on the measured results in comparison with the

U.K. standards. As noted in the report we're not aware of any Canadian friction standards for roads, and I'm sure, partly informed by our knowledge of the standards for runways here in Canada, those results are concerningly low.

Q. But it's not a runway?

A. It is not, no. And I guess you could make the argument that less friction is required on roadways as compared to runways.

Q. But your father did have, as you indicated, some experience with roadways?

A. Yes.

Q. And what sort of remedial action might be contemplated there, again, if you know?

A. Yeah. So that really depends on the underlying cause of the low recorded results. In the case of rubber deposits you have two main methods available to remove the rubber: One via chemical application and essentially dissolve and sweep away the rubber, the other would be actual just mechanical brushing it away versus if the -- if it's a texture, you know, microtexture macrotexture polishing-type

issue that's causing the reduction. Generally it's called shot blasting where little steel balls are fired at the pavement to actually chip it away and try and recover the macrotexture.

Q. And again, you're speaking about runways from your --

A. Yes. I would assume that similar techniques would be applicable to roadways, and I mean, I suppose that resurfacing is also an option.

Q. Right.

A. Grooving actually, yeah. There's -- on runways occasionally, especially recently grooving is another approach that has been taken.

Q. That's where they are actually -- I don't know --

A. Diamond cutting grooves, yeah, yeah. It -- that does --

Q. Diamond grinding, is that --

A. Yeah, yeah. And I mean, that will drastically improve the drainage properties for sure, so to the macrotexture but even more than macro because they are usually

about an inch apart or so.

Q. And what about -- do you know what he meant by "a more detailed investigation"?

A. Not specifically but, you know, whether that be ongoing or frequent, more frequent or measurements all the way through to -- yeah, what is the actual problem here? Is it the pavement? Is it the wear? Is it the contamination? Yeah.

MR. LEWIS: Commissioner, it is -- I'm just going to move on to the Golder report. It's just before is 11:30. Would this be a good time for the morning break?

JUSTICE WILTON-SIEGEL: Yeah, why don't we take our break. We'll stand adjourned until quarter to 12:00.

--- Recess taken at 11:27 a.m.

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

BY MR. LEWIS:

Q. So, Mr. Taylor, we know that Golder -- just put some context for you -- sent the Tradewind report to the City of Hamilton as an appendix to a draft report by Golder, and in the inquiry we generally call it the Golder

report. And then the entire Golder report, including the Tradewind report appended to it, was marked -- watermarked as "draft."

Did you know -- or -- did you know, first of all, that Golder was using the Tradewind report as part of a broader analysis? Is that something you had any appreciation of?

A. I don't believe I knew, and probably we didn't specifically know it was going to be copy pasted into a different report going to the next person in the chain.

Q. Okay. When you say "we," you mean your father and --

A. Yeah, yeah, we at Tradewind.

Q. And do you know if there was any appreciation that it was going to be marked as draft. We've heard that it was an error that it was marked as draft, but do you have any knowledge of that?

A. Again, I don't, and also I doubt that we did, and furthermore upon being e-mailed on Sunday the 24th of January, it was by no means a draft from our point of view. It's very rare that we would ever modify after

distribution to the client.

Q. It was a final report?

A. Yeah, absolutely. Yeah.

Q. And it was actually the 26th?

A. Oh, sorry.

Q. And do you recall when you first became aware of the Golder report?

A. Of the Golder report. That's pretty recently through this inquiry process.

Q. Through the inquiry process?

A. Yeah.

Q. Okay. And if we can go the Golder report. It's at GOL2981. And if we could go to image 10, please. And so in section 5.0, friction testing, if you could expand that whole section for us, please, Registrar. Thank you.

So here's the summary, and the summary numbers are the same ones that were in the e-mail we looked at earlier. And you've had a chance to review this in the context of the inquiry?

A. Yes, I have.
Q. Okay. And did you have -- do you have any views on the summary in relation to the Tradewind report?
A. It's fairly short.
Q. Yeah.
A. In my view, leaving out quite a bit of context. So I guess there's an argument (indiscernible) an appendix. One can also just read the appendix. And then, furthermore we've got a different naming convention for the lanes which perhaps that's a no-more-road kind of naming. But I wouldn't immediately know which one is lane 1 and which one is lane 2. But of course we get back to this north, east, west, south issue as well.
Q. Right.
A. But if the whole report is included as an appendix, you know, perhaps that's standard practice from --
Q. Okay.
A. -- (indiscernible) part.
Q. All right. What about the -- there is no reference to the -- there's a reference to the LINC in the testing, but it

doesn't actually provide those results. Do you have a view about that?

A. Yeah, that is curious. I mean, I've been a bit curious. The original work we were contracted to do, was it -- why were both pieces of pavement tested. It was only -- was only the RHVP of actual interest, were we testing other as a comparison. That's been a curious one as well because like you say it's sort of missing half the data from our point of view from the data we collected.

Q. Right. Now, in fairness this is a -- the Golder report is about the Red Hill itself?

A. Right. So I guess then question is why was data collected on the LINC.

Q. Okay. Okay. And if we could go to Golder GOL4370. And this is the Tradewind invoice to Golder dated January 24th, 2014 for $4,925 plus tax for the testing in the Tradewind report.

Were there any further pavements received from Golder by Tradewind in respect of this work?

A. We did a review of the

accounting system and did not find any other payments, no, or invoices.

Q. Okay. And has Tradewind been contracted by Golder since then?

A. Not to my knowledge.

Q. Take that down, Registrar. And if we can go to overview document 7, different -- overview document 7 and image 82, please. And paragraph 257, if you could expand that for us.

And so in this one on December 17, 2015 Dr. Uzarowski responded to your father's January 26th, 2014 e-mail with which he sent the Tradewind report originally, and he asked questions about the standards and -- for the testing, and if there's any correlation between GTN grip tester number and FN friction number and indicated that the GTN limits you gave in the report are from the U.K.

Do you know what limits are typically used in the U.S. or Canada? And you were copied on this e-mail. It doesn't mention it in the overview document, but I can tell you that you were copied.

A. And this is about

23 months after the report was sent, right?

Q. No, it's under two years, so this is December 17, 2015, so I guess it's -- oh, sorry, you said 23 months.

A. Right.

Q. Yeah, 23.

A. Yeah.

Q. Your math is better than mine because you're an engineer and I'm not. Or rather -- I'm definitely not a engineer. So --

A. Me neither.

Q. Yeah, exactly. That's why I took it back. So you did receive this, but prior to this, between the sending of the Tradewind report and the receipt of this e-mail, do you recall or know if there were any communications with Golder in the interim period?

A. I do not know or recall. I mean, Len used to get a huge number of e-mails, but no, I don't believe so.

Q. Okay. We don't any record of any --

A. Yeah, yeah.

Q. -- communications, so if you're aware of any calls or anything of that

nature.

A. I'm not.

Q. Okay.

A. It's a pretty specific question to be asking almost two years later.

Q. Fair. To your knowledge until this e-mail did Golder ever raise any questions about comparing friction testing methodologies or standards to apply to the testing?

A. Not to my knowledge, no.

Q. And did you yourself ever discuss these issues with Dr. Uzarowski following this e-mail?

A. No.

Q. And we do have e-mails later, if we could go to images 113 and 114, paragraphs 361 through 364. You don't have to expand them.

There's communications between -- on February 19th through the 22nd there are e-mails between your father and Dr. Uzarowski, Dr. Uzarowski follows up from earlier e-mail, and then there's back and forth.

Do you recall if you were

aware of these at the time?

A. The exchange? I mean, I don't specifically recall the exchange.

Q. I don't think you're -- I'm going to check. I don't think you were copied on those e-mails, but I don't want to misspeak so just give me one moment.

A. Comparison between grip tester and E274 locked-wheel friction measurement trailer. Interesting.

Q. Yeah, so you're not copied those e-mails.

A. Okay.

Q. But you're -- if you know --

A. Too bad. I would like to see that document.

Q. And do you recall any discussions with your father about those at the time? Did he make you aware?

A. I don't, no, no.

Q. Okay. And as you -- you're probably aware through the inquiry. How did you learn that the City had concerns about whether the information in the Tradewind report

had been appropriately shared?

A. I mean, exclusively through this inquiry process.

Q. Okay. Do you recall when you became aware?

A. What year was that? Was that late 2018 or --

Q. No.

A. -- late 2019.

Q. February 2019 was when it came out in the media, early February 2019.

A. Yeah, yeah.

Q. So is it around that time when it came --

A. Yeah, around that time, yeah.

Q. Did you learn about it through the media?

A. Yeah, I think it was a phone call into our office as from some media outlet.

Q. Oh, from the press?

A. Yeah.

Q. Okay. And did anyone at the City contact you or your father about this?

A. Yes. My understanding is that maybe a couple of weeks after it was in the press, the City auditor had a phone conversation with Mr. Leonard Taylor.

Q. Okay. But you weren't --

A. I was not party to that.

Q. Okay. You can take those down, Registrar. And if we could go to RHV889.

So this is a letter dated June 17, 2021 responding to a letter as indicated there dated May 31st, 2021 from Rob Centa, our former partner and lead commission counsel, and wrote a letter asking a number of questions which you then responded to in this letter by repeating the questions and then providing the answer. Do you recall this letter?

A. I do. They were getting closer to the present day.

Q. It always helps to be closer?

A. It helps a lot.

Q. Usually does. Okay. And you wrote this letter?

A. Yes.

Q. Okay. Could we -- this

is not in the overview document. If we could mark this as an exhibit, Commissioner. It would be Exhibit 103.

JUSTICE WILTON-SIEGEL: Thank you.

THE REGISTRAR: Noted, Counsel. Thank you.

MR. LEWIS: Thank you.

EXHIBIT NO. 103: Letter dated June 17, 2021 to Robert Centa from Rowan Taylor; RHV889

BY MR. LEWIS:

Q. And the questions asked were to respond to some issues arising from the work conducted by CIMA, and specifically a memorandum to mayor and council dated February 4th, 2019 and a final report dated May 2020. And I understand from your letter that in answering some of these questions you consulted with the manufacturer of GripTester which is Findlay Irvine of Scotland?

A. That is correct, yes.

Q. Okay. And so there's some overlap in the questions. I principally just want to talk about the investigatory level chart

that your father and used in the Tradewind report to establish the investigatory level of 48.

So if we keep the letter up, and then if we could pull up HAM12842 which is the CIMA February 4th, 2019 memo to mayor and council. And if we could go to image 4 of that memo. And it's the last two paragraphs of that page which was what we asked you about in question 1, responded to in your letter.

So -- and this is about the reference table showing the threshold levels and where that was from. And then -- one second -- and the point that CIMA makes is Tradewind used a different chart than is typically applied.

If we go to the next image on the right-hand memo. It's a little -- if you just -- perfect there. Yeah. Thank you.

And CIMA says a more -- this is a different chart that should be used, and it's the U.K., PMS table which for dual carriageway shows a 41 or 47. You see that?

A. Yes.

Q. Okay. And if we go back to your letter, if we look at image 2. Yeah. Go to the next image, please. Thanks. And then the

top -- if you could just expand those last top three paragraphs. Thank you.

If you could explain -- if you could just explain what you ascertained from your discussion with Findlay Irvine and your review.

A. Absolutely. So in speaking with Findlay Irvine, it looks like the original table in our report comes from the same U.K., PMS source, but specifically HG2894, so 1994 is where that comes from, those numbers come from. There -- at the time of the report was created, there have since been -- have since been an updated version, HG2804, 2004, which is -- my understanding is the ones in the CIMA reports. And so they are similar, but they are not identical.

Q. Right. And the investigatory level is lower?

A. So, yeah, for dual carriageway in the 2004 version investigatory level appears to be either 41 or 47 as opposed to the 1994 version which is 48. A little unclear me even today what you're supposed to do with a range when using it as a threshold.

Q. Okay. And were you and

your father in 2014 not aware of the more recent 2004 version?

A. I certainty was not, and I don't believe Len was either.

Q. Okay. And would Tradewind's recommendations in the Tradewind report have changed in your estimation had you applied the more recent investigatory levels that CIMA identified?

A. I don't think they would have changed much at all, we tend to analyze data on the more conservative side, so we would've used the 47 number which is, you know, one point down which makes very little difference to the analysis and conclusions.

Q. Right. Well, what if it was the 41?

A. The 41 I guess you're closer to the thresholds on the RHVP, so, yeah, perhaps.

Q. Well, it's still below, though?

A. Still below, it's just less below, right, so....

Q. Okay. And does it change

what the test results themselves are?

A. It in no way changes the measured test results.

MR. LEWIS: One moment, please. Thank you very much. I do not have any further questions.

So counsel have indicated that -- at least two counsel that they have questions, and I'm not sure who wants to go first, as the longer estimates were for Ms. Contractor for the City and Ms. Roberts. We didn't discuss who was going to go first. So perhaps Ms. -- I think Ms. Contractor was expecting to go longer, so perhaps she could go first.

MS. CONTRACTOR: Certainly, thank you. Mr. Commissioner, may I proceed?

JUSTICE WILTON-SIEGEL: Yes, please proceed, Ms. Contractor.

EXAMINATION BY MS. CONTRACTOR:

Q. Good morning, Mr. Taylor. My name is Delna Contractor. I'm counsel to the City of Hamilton. I'm just going to ask you a couple of questions with respect to some of the matters that commission counsel took you through.

And, Mr. Registrar, could we

please go to TRW71.

And so commission counsel took you to this e-mail from Mr. Hogarth. And, commission counsel -- I wonder if we could make it a bit bigger. Or just call out the body of the e-mail perhaps, and particularly the e-mail at the bottom.

And so this e-mail from Mr. Hogarth to Mr. Leonard Taylor in which Mr. Hogarth says then the Red Hill Valley Parkway is the pavement of concern and has the lower friction values. And I take it from your evidence this morning that you don't recall any further discussions with Mr. Hogarth regarding what he meant by "pavement of concern."

A. I do not, no.

Q. And I take it that he may have just been referring to the difference in friction values between the Red Hill and the LINC?

A. Yes. I would say that there are two interpretations there. That is one of them. The other is that he was advised on-site that the RHVP was of more concern than the LINC.

Q. So he was advised on-site. Who would have advised him of that?

A. He may have been. Who -- I mean, anybody else who was on-site at the time.

Q. I understand. And I take it that you're not aware of any City staff that were on-site?

A. I actually have no idea who else was on-site at the time.

Q. And you typically -- you also stated that typically Mr. Hogarth flags the results that are lower which may encourage Tradewind to process the data on a more priority basis?

A. That is correct, yes.

Q. And I believe you stated that an eight-week turnaround time approximately, which is what we see here is your typical turnaround time?

A. Not unusual.

Q. Right. So fair to say that Tradewind did not need to see -- did not have any need to prioritize the review of the Red Hill data on a priority basis?

A. I don't know if it's fair to say we didn't need to, but we certainly don't appear to have prioritized it.

Q. Right. You didn't identify as something that needed to be prioritized at the time?

A. I'm saying we didn't -- we did not appear to prioritize it at the time.

Q. Okay. And you've stated that one of the key findings of the Tradewind report was the difference in friction values between the Red Hill and the LINC. And I take it that generally speaking friction values of a roadway decrease over time?

A. I don't know how much I can comment on friction values on roadways in particular and their trends over time, but certainly that's something that we see in the airport runway data.

Q. Okay. And I understand from your evidence this morning that at the time that Tradewind was preparing the report, they were not aware that the LINC was resurfaced in the summer of 2011?

A. That is my understanding, yes.

Q. And so the -- when Tradewind tested the friction levels on the LINC,

that was just over two years before -- sorry, after the resurfacing was completed?

A. Okay.

Q. And the Red Hill on the other hand opened in 2007, and so that testing was completed nearly seven years after it opened. And this morning you stated that knowledge of repaving or remediation of a roadway is important and usually included in your reports because it could explain -- help explain the difference in results.

And so based on that, is it fair to say that in 2013 the LINC would be expected to have higher friction levels than the Red Hill given that it was resurfaced in 2011?

A. I think that you have to consider a lot of factors there in addition to the age, right. If all else being equal, that is the same pavement applied in the same conditions, you know, by the same folks with the same traffic levels over the amount of time, then, yes, you could draw that conclusion, but there are a lot variables at play there.

Q. Certainly a lot of variables, and one of those is how recent the roadway was resurfaced, correct?

A. Yes. And in some case a brand new paved job can actually result in decreased friction levels that then improve over the first year or so in service.

Q. Right. And did you understand the LINC to have pavement that would have lower friction values that would increase over time?

A. I don't have any specific understanding in that regard.

Q. Okay. And if we could go to Golder -- sorry, I'll just -- I'll add that given that the LINC was resurfaced two years -- at least or almost two years before the testing, any kind of early age friction issue wouldn't be contributing to the results at that point?

A. Yeah, in our experience that is correct.

Q. Okay. And would be go to GOL1113, please. And image mean 6 and 7. Thank you.

Commission counsel took you to these graphs and noted the difference in friction values between the Red Hill and LINC and again asked whether it was reasonable to infer that

surface mix might help explain some of that difference. And I think you stated that it would be reasonable to infer that. And again, I take it that the fact that the LINC was resurfaced two years prior to the time testing versus seven years for the Red Hill, that could also help explain the difference or at least help explain some of the difference.

A. It could. Of course, it's also possible that a piece of pavement is resurfaced with pavement with worse friction characteristics, right. It's not a guarantee they're better than what is already there.

Q. Right. And do you have any reason to believe that the LINC was resurfaced in 2011 with pavement with worse friction characteristics?

A. I do not.

Q. Okay. I understand that generally Tradewind does friction testing in the summer through to October. Does that sound right?

A. Yes.

Q. And you stated as well that contaminants on the road could throw off the friction testing results?

A. Absolutely.

Q. Okay. Would that include brine or other materials that are laid down on the road as a preventative winter control measure?

A. Yeah, yeah. I mean, a liquid brine, if it's of a substantial depth, could certainly affect the results. Even residue from the salt from the brine could be foreseen to affect the results.

Q. Thank you. And could we please go to TRW36.

So this is the initial e-mail from Dr. Henderson at Tradewind requesting friction testing on the Red Hill and the LINC. And I appreciate that you're not on this e-mail, but just wanted to pull it up so you have a sense of the initial communication.

Do you recall whether Golder at any point advised Tradewind that the reason that the City wanted to conduct friction testing was as a result of comments from the police that the slipperiness of the pavement was contributing to collisions?

A. I do not have any knowledge or recollection of that, no.

Q. And did anyone at Tradewind advise, you or your father, for example, that they were given that information from Golder?

A. I don't believe so, no.

Q. Okay. And, Mr. Taylor, I take it that repeat friction testing is usual in assessing the friction patterns over time?

A. Yes. And I believe I alluded to that earlier my testimony about the frequency at least for airports is definitely a -- a one shot is -- it tells you -- it gives you data, but it doesn't help you at all with trends.

Q. Right. And so that comparative information provides important data about how the road is doing from a friction perspective?

A. The pavement, yeah, definitely.

Q. Right. And then we can go to it if you'd like, but we know that the recommendation in the Tradewind report with respect to the Red Hill was that a more detailed investigation be completed?

A. That is correct, yes.

Q. And am I correct that one

such type of investigation would be to compare the friction testing data over time?

A. That would definitely be one of the arms, yes.

Q. Okay. And if we go to Tradewind 36 -- oh, which are at. Sorry, I have the wrong reference. But I'll ask you, and if you need to go to the e-mail, we can certainly do that.

Commission counsel took you to correspondence from Dr. Uzarowski to Mr. Leonard Taylor prior to the Tradewind report having been issued and provided to the client in which he stated that his client, the City, was looking for comparison between friction testing data that was done in 2007 and the testing that Tradewind did in 2013. And at that point when Dr. Uzarowski sends your father the e-mail, the Tradewind report is not finalized.

I take it that no one from Golder provided Tradewind with the 2007 testing data to compare it to the Tradewind data?

A. No, and I don't think we've seen it as yet.

Q. Okay. And if the City

understood that the 2013 results were higher than the 2007 results, that would be -- as you agreed to earlier, that would be part of the investigation, the additional investigation that the road -- that the report recommends?

A. Yes. I mean, that's how many years. That's six years even before you get into the different test methodologies, but it's a piece of the puzzle for sure.

Q. Okay. And is it fair to say that based on that comparison, they may come to the conclusion that additional remedial measures may not be required; that that could be a reasonable conclusion based on that comparison?

A. Who is "they" in this context?

Q. The City.

A. The City. I mean, we can't really say what the City should or should not be concluding.

Q. Is that a reasonable conclusion? If the 2013 results they understood were higher than the 2007 results, the recommendation in the report is to do further investigation, and you've --

A. Okay.

Q. -- told me comparison is one such investigation?

A. Yeah, it's one of a few different elements of further investigation.

Q. Right. And am I right that the report doesn't identify specific kinds of investigations, correct?

A. It does not, no. Because it could range from further measurements to an investigation of the root cause for the low friction values.

Q. Right. And am I correct that Golder did not ask Tradewind to do any additional follow-up friction testing on the Red Hill?

A. That is my understanding.

Q. And do you know whether Tradewind ever contacted Golder just to follow up to see whether they needed any more friction testing.

A. I do not know, but I -- knowing us, I doubt it.

Q. And I would like to go GOL113 and to image 13 specifically.

THE REGISTRAR: Sorry, Counsel, do you mind just repeating the doc ID for me.

MS. CONTRACTOR: Certainly. GOL1113, and image 13, please.

BY MS. CONTRACTOR:

Q. So this is the conclusion and recommendation section, of course, of the Tradewind report. And again, as we discussed earlier, the recommendation with respect to the Red Hill was that a more detailed investigation be completed.

The report does not provide a timeline by which the investigation should be completed; is that fair?

A. That's fair.

Q. And that reflects the fact that friction measurements that are at investigatory levels are not a definitive indication that a location is unsafe; is that fair?

A. I think in general. I can't really speak to the safety or lack thereof of a pavement surface.

Q. Certainly if the -- if

Tradewind thought that the investigation needed to be done urgently or that there was -- it was a time sensitive matter, it would have stated that in the report?

A. I don't how we would ascertain the urgency in this case especially with the lack of standards in Canada to compare it to.

Q. Understood. So --

A. For reference, in the airport standards there is actually -- there are levels at which remedial action must be taken, must be programmed. So there is more of a timeline in that case.

Q. Right. And there being no such timeline here, none was included in the report?

A. Correct.

MS. CONTRACTOR: Mr. Commissioner, may have a moment to consult my notes?

JUSTICE WILTON-SIEGEL: Absolutely, Ms. Contractor.

MS. CONTRACTOR: Thank you, Mr. Taylor. Those are all my questions. Thanks for your time today.

THE WITNESS: You're most welcome.

JUSTICE WILTON-SIEGEL: Ms. Roberts, please go ahead.

MS. JENNIFER ROBERTS: Thank you.

EXAMINATION BY MS. JENNIFER ROBERTS:

Q. Mr. Taylor, I'm Jennifer Roberts. I'm counsel for Golder. I have a very short series of questions.

You mentioned a couple of occasions contamination on a surface in the form of rubber.

A. Yes.

Q. And I take it that's something that's experienced on runways in particular?

A. Yeah, that is one of the most -- one of the highest concerns on runways, especially those that are heavily trafficked. In fact, a normal size aircraft leaves about a kilogram of rubber behind on every landing, and obviously, you can do the math, that can add up quite quickly.

Q. Got it. So do I

interpret from that that you would find contamination in the landing zone on a runway?

A. Correct. They call it the touch down zones, just in from the two ends.

Q. Okay. And perhaps it's an obvious point, but just for clarification I take it that that is not an experience that roadways are -- that roadways have?

A. I mean, I would imagine that there would be some rubber deposits especially around -- if there were braking zones or acceleration zones or cornering zones, but I would also I take it that it's much less of a concern on roadways.

Q. And in -- okay. So do you have any experience in testing where contamination on a runway was discovered. Sorry, let me rephrase that, where a contamination on a roadway was something that was observed?

A. Contamination on a roadway, no, I don't believe we have any specific experience there.

Q. Okay. And particularly contamination in the form of a rubber deposit on a roadway?

A. Correct.

MS. CONTRACTOR: Okay. Those are my questions. Thank you.

THE WITNESS: That was short.

JUSTICE WILTON-SIEGEL: Okay.

MR. LEWIS: On our break counsel for Dufferin indicated that they would not have any questions, and counsel for the MTO reserved five minutes if necessary. Mr. Saad?

MR. SAAD: I can confirm the MTO has no further questions -- or no questions rather.

MR. LEWIS: Mr. McKay, do you have any questions?

MR. MACKAY: No, I have no questions.

MR. LEWIS: Thank you. I have I believe two very -- well, maybe three questions on two quick documents.

EXAMINATION BY MR. LEWIS (cont'd):

Q. If I could take you -- Registrar, if we could go to GOL1113 which the Tradewind report, and if we could also pull up TW92, Tradewind 92.

And while we're doing that,

Ms. Contractor asked you about whether brine laid down on the road in the context of late season testing and so forth, whether that could affect the results, and you indicated that it could or even -- I think you said even salt residue potentially could have an affect. And --

A. Yes. With brine because if it's in the liquid phase it could be adding to the film depth, and then if it's evaporated then you definitely have a fine particulate of the salt. It would definitely affect the results. I mentioned previously pollen drop actually can --

Q. Right?

A. -- (indiscernible) friction results as well.

Q. Okay. And in the Tradewind report if we could go to I believe it is image 17. Let's try that. No. Sorry, Registrar. It's the native document for Tradewind 92. Yeah, and go to the raw tab. Great. Okay.

And so the first thing is -- if you had -- on the document on the left this is from Tradewind report and specifically the Red Hill -- no, let's just stick with that.

The Red Hill at the top, if

you could expand to that portion. Yeah. Great.

And I see the temperature is given as 7 degrees.

A. Yes. That would be the air temperature.

Q. Okay. And it says the same thing for LINC portion as well.

And then if we go, then, to the other document Tradewind 92 in the native, please. Yeah. And if we could go to the top of the document.

We could go through each of them, but I see in line 19 -- row 19 it says "ice level NA."

A. Oh, okay.

Q. What's that mean?

A. That's an FAA thing. I think it's at .25 they consider the runway to be below like an ice threshold, but yeah, it's nothing to do with actual measured or observed ice.

Q. But if there -- is there any indication in any of the materials from Tradewind that there was any ice or residue of a concern in any way?

A. None that I've seen, no.

Q. Okay.

A. No. And I mean plus seven is pretty safe, not going to be any ice.

MR. LEWIS: Yeah. Okay. Those are my questions. Thank you very much.

JUSTICE WILTON-SIEGEL: Okay. Mr. Taylor, thank you very much for attending the inquiry.

THE WITNESS: My pleasure.

JUSTICE WILTON-SIEGEL: You're excused.

I don't think we have anything else we have to address with counsel today. That being the case, we'll stand adjourned till Monday morning at 9:30. Thank you very much.

--- Whereupon at 12:29 p.m. the proceedings were adjourned until Monday, June 27, 2022 at 9:30 a.m.