RED HILL VALLEY PARKWAY INQUIRY

TRANSCRIPT OF PROCEEDINGS
HEARD BEFORE THE HONOURABLE J. WILTON-SIEGEL
held via Arbitration Place Virtual
on Tuesday, February 21, 2023 at 9:30 a.m.

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Arbitration Place Virtual

--- Upon resuming on Tuesday, February 21, 2023 at 9:31 a.m.

MR. LEWIS: Good morning, Commissioner, Counsel. We have Mr. Brownlee here to continue his evidence today but some issues have arisen over the weekend and we need a 30-minute adjournment to begin at 10 a.m. hopefully. If we can aim for that right now while we have some discussions about that, Commissioner, it would be appreciated.

JUSTICE WILTON-SIEGEL: That's fine. Let's stand adjourned then until 10 o'clock.

MR. LEWIS: Thank you.

--- Recess taken at 9:32 a.m.

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

MR. LEWIS: Good morning Commissioner, Counsel, Mr. Brownlee, we're back.

I would like to open this hearing by acknowledging that the City of Hamilton is situated based on the traditional territories of the Erie, Neutral, Huron-Wendat, Haudenosaunee and Mississaugas. This land is covered by the Dish With One Spoon Wampum Belt Covenant which was

an agreement between the Haudenosaunee and Anishinaabek to share and care for the resources around the Great Lakes. We further acknowledge that the land on which Hamilton sits is covered by the Between The Lakes Purchase 1792, between the Crown and the Mississaugas of the Credit First Nation.

Many of the counsel appearing at this hearing today are in Toronto which is on the traditional land of the Huron-Wendat, the Seneca and, most recently, the Mississaugas of the Credit River.

Today this meeting place is still the home to many indigenous peoples from across Turtle Island and we are grateful to have the opportunity to work on this land.

Now, Commissioner, we are -- apologize for the fits and starts this morning, but as I've advised participants and counsel, yesterday we received some information from counsel for the City, Lenczner's, respecting the 30FE analysis -- that's Mr. Karim's report -- on two issues in the 30FE report which is inconsistent with some information 30FE had previously provided to us and which formed a basis

for Mr. Brownlee's TNS -- of TNS for his consideration and testimony on those points. Those two issues pertain to the 30FE collision rate analysis and analysis of the single motor vehicle and rear end collision comparison that 30FE has in their report.

I think that all counsel agree that the most important thing is putting evidence before the inquiry in a clear and orderly way for your consideration rather than Mr. Brownlee speculating or anticipating what 30FE has done before hearing about it directly from 30FE, and as such, counsel this morning discussed and agreed to proceed as follows, subject to your approval and direction.

First is we will proceed today with Mr. Brownlee's continued evidence but without evidence from him respecting the 30FE collision rate analysis or single motor vehicle versus rear end collision comparison analysis. I will finish up Mr. Brownlee's evidence in-chief today with his opinion respecting the contributory factors to wet road collisions that are outlined in his report, and then participants' counsel will cross-examine Mr. Brownlee on the evidence given to date.

On Thursday Mr. Karim of 30FE is scheduled to testify in-chief and will do so as scheduled, and in the course of that we expect that he will provide the explanation for his analysis regarding the collision rates and the SMV versus rear end collision comparison in his report.

And then to the extent necessary, at the end of the day on Thursday Mr. Brownlee would be available to provide his evidence on those two issues and we'll have to address and consider whether that will require extending the hearing day on Thursday in some information but we expect that we should be able to fit it all in on that day.

And so I will be fairly quick finishing up with Mr. Brownlee now as I described and participants' counsel got their estimates of approximately 30 minutes each for counsel for Golder and counsel for the City, with minimal time, if any, counsel for the Dufferin and the MTO, so I expect we would be done today by shortly after 12 p.m. or thereabouts on a short day.

So subject to your direction, that's how we propose to proceed.

JUSTICE WILTON-SIEGEL: Okay. Well, it's certainly important that we understand Mr. Karim's evidence. If this is proceeding on the agreement of all counsel involved then I think we should adopt that schedule. Let's proceed then with the remainder of Mr. Brownlee's evidence today.

MR. LEWIS: Thank you.

ROBERT BROWNLEE; previously affirmed

EXAMINATION BY MR. LEWIS (cont'd):

Q. So, Registrar, if we could pull up Mr. Brownlee's report, Exhibit 221, and if we could go to image 28, which is page 26 of Mr. Brownlee's report.

So, Mr. Brownlee, you were -- in your report you were asked about your comments on the ranking by Mr. Malone of -- Mr. Malone of CIMA of the greatest contribution to the inordinate number of wet road crashes as he had apparently relayed to Mr. Boghosian, who is a lawyer, and then as recorded in Mr. Boghosian's memo, and that appears in the box in the middle of your page as the excerpt from that Boghosian & Allen LLP letter to the City of Hamilton. And then as noted in your report at the bottom, it was

Mr. Malone -- was reported by Mr. Boghosian to have ranked them in the order shown there in those four bullets.

Mr. Malone, shortly before your report was due, he testified on I think it was October 31st, as is indicated there that Mr. Malone clarified in his testimony that he didn't believe that he ranked those contributing factors in any particular order to Mr. Boghosian although he agreed that they were all contributing factors.

And then if we can go to the next page, Registrar, and if we can pull up the next page and keep this page up.

And then the first two-thirds of that page 27 you set out your views with respect to the ranking of those four bullets and the contribution to wet road conditions -- collisions. We can see your opinion set out there. Does that remain your opinion?

A. Yes, it does.

Q. And if you could please explain what your views are. We can read what it says, but if you can give us your views I would appreciate it. Thank you.

A. All right. So when we're completing collision analysis overall in a road network and at a specific site we typically will look at overrepresentation or dominant collision types of a certain kind and those will help sort of feed into what contributory factors might be leading to those.

So, for example, if we looked at rear end collisions approaching an intersection I would look at a host of different contributory factors. However, if I were to see that wet road surfaces were overrepresented by a significant amount my attention would immediately turn to pavement friction.

So in the four bulleted points of Mr. Boghosian's letter outlining what he felt were meant by Mr. Malone, I agree that compromised road surface conditions or poor road surface conditions, be it whether they are friction of the pavement, bleeding of the pavement, polishing, wetting, something that is compromising the surface of the pavement that may catch motorists by surprise.

So I've been completing reviews over the last 25 years, once I see wet

road crashes being overly represented I immediately turn my attention to pavement surface, among other things, I mean, I'll always keep my mind open to others.

Likewise, when we look at those four bulleted points, the last one relating to closely spaced and the proximity of on and off ramps at an interchange, in general I would rank that near the bottom of those four contributory factors, it's one that is still prominent and still can occur in certain situations but is definitely not one that I would put at the top.

Dealing with the two sort of central bullet points, number two and number three. While they are worded differently, they both implicate the road user speeding, you know the speeds on the roadway and excessive speed and the horizontal curvature of the roadway. So while the first one appears to speak more to speeding and how that may impact vehicle control around a horizontal curve, the second one talks about the curves first but then implicates the speeds.

So those together most definitely I would rank number two. Horizontal curves in general, they do contribute to more

collisions than you would on a tangent road section. You've got road users that are attempting to go around a curve. Their attention is away from potentially other hazards and things on the roadway. They are challenged to keep vehicle control and lane keeping around a curve. So we know in the industry that having a curve versus a tangent you're going to have higher collision experience at those.

But when we look at mostly -- in my experience when we look at issues around horizontal curves our mind is in many cases turned to the delineation of the curve, how abrupt it is, what the motorists perceive the appropriate operating speed is, the signings, the markings, all those types of things. Rarely do we see snow and slush and other compromised road surfaces sort of coming up as an overproportion of those collisions because most prudent road users when they get in gravel, snow, slush, ice, they are going to adjust their speeds both on the tangents and the horizontal curves. So that usually doesn't rise to the top in a collision history at a curve.

However, when we start seeing

a large proportion of wet weather collisions it's something that they would deal on a routine basis and something that they may not expect to compromise the road surface and the friction available to them to negotiate that curve significantly, all else being equal.

So essentially bringing those two things together, the speed and the horizontal curvature along the Red Hill Valley Parkway and the motorist being potentially somewhat surprised that they can't operate under wet weather conditions typically like they would be able to, would be what I mentioned on Friday, an expectancy violation.

Q. And so if I -- and I'm sure you do -- in your view there is the ranking as you described, although they are nevertheless interrelated because of the question of friction demand in those circumstances; is that right?

A. Yes.

MR. LEWIS: Thank you. I don't have any further questions, except of course on the two areas that I, Commissioner, noted off the top that I will deal with on Thursday. And so I would, subject to any questions by you, turn it

over first I believe with Ms. Roberts who is going to graciously go first, and followed by Mr. Chen.

JUSTICE WILTON-SIEGEL: Okay. Ms. Roberts.

CROSS-EXAMINATION BY MS. JENNIFER ROBERTS:

Q. Well, Mr. Brownlee, we've been here before. I represent Golder.

Registrar, thank you, you can take that down.

I want to first address the issue of design speed and posted speed. You gave evidence in relation to the CIMA analysis in 2015 and their assessment of the numbers of drivers exceeding what they theorize was the design speed of 110 kilometres per hour, and in your report you said based the actual design speed of 100 kilometres per hour, that would mean with the CIMA data that between 34 and 48 percent of vehicles were at or exceeding the design speed given the curvature of the mainline. Do you remember that?

A. Yes, I do.

Q. And that's in reference -- when you're looking at the design speed, and just to put it out there, that is all

in reference to the guidance in the MTO guide of 1985. That's correct?

A. It's -- I don't know how the operating speeds are related to the guidance.

Q. Sorry, the design speed. When I'm talking about the design speed you're referring to the design speed for the curvature given the 1985 MTO guide?

A. Correct, yes.

Q. And you're aware in 2017 that there was a revision in the TAC guidance to design speed and curvature?

A. In terms of -- that's a pretty broad statement. In terms of what?

Q. In terms of the appropriateness of a curvature -- well, let me be specific. One of the curves on the Red Hill is 420 metres. That's correct?

A. Yes, it is.

Q. Radius. And under the 2017 TAC guide, at least as I understand it, that a design speed of 100 would not have been considered appropriate under that modern guidance. Do I have that right?

A. I would have to go back

and take a specific look at that.

Q. Okay. It's not one of the documents before you so I don't intend to belabour the point. Okay. Let's go to the issue of expectation and overlapping -- what I really want to go to is the issue of overlapping expectation violations.

Registrar, can you please go to appendix C, which is the second-last image in Mr. Brownlee's report. Thank you.

You've -- this is part B, the Phillips-designed middle section of the Red Hill.

A. Yes.

Q. And you pointed out, and commission counsel took you to the evidence of the radius of the turn.

So if we're starting on the left side of this page and assuming we're going northbound to the right, we've got a turn before Greenhill which is all of the tangent; it's very open. And then we go into a series of three turns, 420, 450 and then 690 and then again back to 525. Do you see that?

A. Yes, I do.

Q. Okay. In your report on

page 21 -- it's image 23, Registrar, if you can briefly go to that. This is -- southbound Red Hill approaching King and you're looking at the issue of sight lines here?

A. That is correct, yes.

Q. I guess the point is is that you've got an exit ramp you can see to the right and you're saying that there's an on ramp just behind where there's all that foliage that --

A. That is correct, yes.

Q. And the sight distance issue is that as you're driving on the mainline you can't see at this point that there's going to be a ramp going off?

A. That is correct, and also any interactions with that ramp on and off, yes.

Q. I think --

JUSTICE WILTON-SIEGEL: Sorry, going off or coming on?

MS. JENNIFER ROBERTS: Coming on. Forgive me.

THE WITNESS: It would be an entry ramp, yes.

MS. JENNIFER ROBERTS: Registrar, can you please go to Dufferin

Document 2535. I just want to go to the drawings.

THE REGISTRAR: Can you repeat the name of the document, Ms. Roberts, please?

MS. JENNIFER ROBERTS: It's document 2535. There we have them.

BY MS. JENNIFER ROBERTS:

Q. So these are the drawings produced by Dufferin which -- and this is part B to the Phillips drawings, and it's from these drawings that appendix C annotated drawings were taken.

Registrar, can you please go to image 26. Let's go to -- this is coming up to the King Street ramp but maybe let me go forward once just to orient you. Registrar, can you please go forward one image to 28, see if we can't do this. And one more. And one more, please. I want image 27, please.

Sorry. Can you hear me? Okay. Sorry about that. I lost my screen.

So, Mr. Brownlee, can you see this? Just to orient you, this is a series of interchanges around King Street?

A. Yes.

Q. Now, Registrar, can you

go back to 26, please. There we have it.

So this is the mainline as -- to the right it's coming up to King Street, does that fit with -- I expect you've looked at these drawings many more times than I have, Mr. Brownlee. That's what I understand. Do you think I've got that right?

A. Yes, if I have my orientations right, the photo that we were just looking at was sort of from the left towards that exit ramp.

JUSTICE WILTON-SIEGEL: So this is southbound?

MS. JENNIFER ROBERTS: Bottom is northbound and the top is southbound.

JUSTICE WILTON-SIEGEL: But the photograph we were looking at was facing southbound or northbound?

BY MS. JENNIFER ROBERTS:

Q. I actually wondered if it wasn't northbound, but, Mr. Brownlee, why don't we just look at it. I'm not sure particularly anything turns on that particular photo.

A. That would be my challenge, living on the opposite side of the

lake.

Q. Mr. Brownlee, would it help you to look at that?

A. I would have to go in and locate that again.

Q. So let's just -- let me just stick with some points that I'm making. So if we stick and look at the northbound lanes just at first pass, on the left side of this drawing there's what I understand to be a railway overpass?

A. Yes.

Q. So do I understand it then that the site distance for that ramp going off to King Street would also have a sight distance challenge because of the overpass?

A. It may, and that was some of the challenges with looking at design drawings. It's generally what I was showing in my photo there with some of the foliage that was on the inside of the ramp as you're leaving the freeway.

Q. Just for clarity, this is -- if I think I've got it right, this is the point at which we've got the 420-metre radius turn, if you look at the apex of that turn on this

drawing?

A. It appears to be. Yes, it is that location.

Q. Okay. So in terms of you've got -- if you're driving on the northbound you've got the railway overpass, you've got an exit going off to King Street and you've got the tight turns. Are those sort of a summary of the geometric and -- geometric features?

A. Yes.

Q. And, Registrar, can we please go to the next image. Thank you. So then we've gone past the ramp going off and you see here King Street, and you see the ramp going on to the mainline at the bottom of this drawing?

A. Yes. The previous drawing was coming from the left of this one and now there is a ramp that's coming onto the Red Hill Valley Parkway Parkway.

Q. Okay. So on the northbound lanes there's now three lanes because the bottom lane is -- becomes a weaving lane?

A. That's correct.

Q. And just to touch on it, because I think it's -- so if you look at the

southbound side of the mainline here you've got a ramp you can see from King Street going on the mainline?

A. Yes.

Q. And this again is another turn in this area and I think this is the 450-metre radius turn. Do I have that right?

A. Yeah, I think that was the one that went through the interchange and beyond, yes.

Q. Okay. And so just so that I understand it, Mr. Brownlee, when you are coming onto the mainline from that ramp, this is on the southbound side, you're coming on on a turn?

A. Are you talking about the one to the upper part of the drawing or to the lower?

Q. To the upper part. I'm looking at the southbound right now?

A. Yeah. You would be approaching on a curved ramp onto a curved road section, yes.

Q. And does that create itself some challenges in terms of sight distance?

A. Yes. Any time that you're travelling along a curve there's potential for sight distance issues on what the available road is ahead. I haven't been able to measure those from the design drawings, but it would create an additional challenge to a tangent road section, yes.

Q. So a driver trying to enter from King Street on the southbound mainline has the challenge of navigating the ramp, the continued turn, and had a difficulty in actually seeing oncoming traffic on the mainline?

A. Yes, he or she would be entering into traffic trying to make that decision while negotiating a curve and trying to maintain their line and there potentially would be some sight distance issues there.

Q. On the northbound side again you've got a ramp coming onto the Red Hill mainline, you've got that weaving lane we've identified, and you've got on bound traffic negotiating entrance into the Red Hill on that 450-metre radius turn, correct?

A. Yes.

Q. Registrar, can you please

go to the next image. So this one is not so exciting. This one just shows the bottom -- if I say on the northbound we've got three lanes and that shows the weaving lane, the bottom lane, between King and Queenston?

A. Yes.

Q. Okay. And if I understood your testimony that the distance between interchanges of the King and the Queenston are the tightest in the Red Hill?

A. That is correct, yes.

Q. And they are significantly under the recommended guidance of 2 kilometres?

A. Yes, it is.

Q. And just I think to orient you for that photograph that you took, I'm assuming that you took it -- it's on the southbound side, you took it somewhere just past that ramp going off to King Street?

A. Potentially. I either was approaching King Street on the other end or this end, but that would be the southbound direction, yes.

Q. Okay. So that foliage is

somewhere in the -- likely somewhere where that ramp in the mainline is?

A. Yes.

Q. I'm just orienting you, thanks. Registrar, can we go down one image please. Go to the next image.

So here we have -- so this I think is the ramp to Queenston, and perhaps I didn't address it. So when I talked about the distance between the interchange at King and the interchange at Queenston, here you've got the exit ramp going off to Queenston. I think that's right, isn't it?

A. Yes, it is.

Q. And so in that area of the very tight spacing between interchanges you had that weaving lane which was constrained by the distance between those two roads?

A. Yes. We would have individuals who are trying to enter from the upstream ramp and other individuals would be attempting to exit at the ramp we have on the screen right now.

Q. Registrar, if you can please go to the next image. All right. So then

you can -- yes, clearly marked on the top of this drawing you can see, just to orient you, that it's got the Queenston Road, you've got -- on the bottom part of a drawing you've got the ramp from the mainline onto Queenston?

A. Yes.

Q. It looks as though that's a stop sign there; is that right? Is that a light or something at the exchange with Queenston?

A. Off the top of my head I can't remember if that is signalized or not or if it's controlled.

Q. Okay. Not important. And again --

A. It's a [indiscernible] ramp so I would assume it's signalized but it may not be.

Q. And looking at the southbound, so the top of that drawing, there's another ramp from Queenston onto the southbound mainline?

A. That is correct, yes, the -- there.

Q. And again, just as the other one, in this one it's -- I think this is

about where 450-metre radius turn is?

A. It's I think a little further to the --

Q. To the right. Okay. So this is 690?

A. Yeah, that would be -- if I remember correctly, yeah. I don't have the overall plan in front of me but the 450 is through the King Street interchange.

Q. Sorry, it's farther to the north?

A. To the south.

Q. Sorry, yes, you're right. The turn is 690 there and then it goes into 525 on the other side of that interchange?

A. Right.

Q. That's right. Thank you. Okay. So just looking at the southbound, again we've got an issue with a ramp coming onto the mainline on a curve?

A. Yes, it is.

Q. And again, just as you explained when we were looking at the ramp onto King Street, that that creates challenges in terms of sight distance for both drivers on the mainline

as well as for people trying to go onto the mainline from the ramp?

A. If there is -- where the orange markings are, if there's any kind of vertical features there, trees, any kind of structures or anything that's going to block the sight lines, but otherwise if that area is relatively open then the merge would be pretty typical other than it's on a curve as you pointed out.

Q. Thank you, Registrar. You can take that down. Can we please go back to -- can you please go back to the appendix to Mr. Brownlee's report which is the second-last image. I want to look at just the whole thing again. Thank you.

So I took you to the drawings that are the details for individual portions that you can see on this drawing. What I want to try and understand, because your report talks about expectation violations in terms of speed and the radius of the turns and the interchanges.

When I look at this, and correct me if I'm wrong, what you've got though is you've got overlapping expectation -- expectancy

violations, particularly in this area around King and Queenston. You've got a speed at the maximum for the design, you've got tight curvature, close interchanges, tight weaving distances, and although you haven't been able to measure the sight expectancy, you clearly have some challenges in terms of sight distances. So you don't have one issue of expectancy, you have a number of them all at the same time, do you not?

A. Yeah. This is obviously one of the more challenging areas in the design of the Red Hill, and we are bringing together, yeah, closely spaced interchanges, weaving sections; we're going to have vehicles that are trying to negotiate the curves, they are going to be coming up on vehicles that are entering and/or exiting and they need to monitor their progress and are they going to be in conflict with you as you travel along this freeway section.

And putting interchanges close together is also going to cause potentially congestion, especially if there any kind of turbulence with the weaving sections. So there could be potentially a greater probability of congestion and backup and slowed or stopped

vehicles, speeds that you may not expecting a free flow facility.

Q. And do those factors come together to create a circumstance, as you've described it, as effectively a very high demand on the driver?

A. In this corridor it's the higher demand area of this corridor, yes. In terms of workload yes. I think we're speaking of motorist workload.

Q. I'm trying to understand your language, Mr. Brownlee.

Okay, Registrar, could we please go to Dr. Flintsch's report. That's EXP191. I think it's Exhibit 220, page 7, which I think will be image 9. Thank you.

So in the paragraph just below this figure 2 it looks at the ARA -- Dr. Flintsch starts to discuss the ARA measurements that were taken in 2019 before the Red Hill was resurfaced, and he -- his report says in that paragraph that the average friction remained approximately the same level as when the MTO performed its final testing in 2014 and the average FN(90) for the four lanes ranged between 31 and 35.

Do you see that?

A. I see it, yes.

Q. If -- Registrar, can we please go image 11. So this is a figure where he spotted the ARA -- wait, wait. I've got page 9 please, Registrar. Thank you. I'm trying to stay on your image on the image numbers. It's a bit scrambled between us.

So this is Dr. Flintsch plotting the ARA test results. And again what you can see is he's plotted against locations, and when I look at this it appears that the friction just as he's described is hovering a little above 30, a couple places below, but in that Greenhill/King Street/Queenston on the northbound lane it's in that range. Is that what you see?

A. It's hard to tell from all these points. I think it would be better for Mr. Flintsch to answer the question about what the percentage -- or what the values are in there. It's a pretty random plot.

Q. Okay. So he says in his report that they are averaging between 31 and 35. And my point is is that the friction isn't particularly variable on the Red Hill. The

averages is in fact pretty consistent. Dr. Flintsch and Dr. Uzarowski describe the friction on the Red Hill as relatively low, and Mr. Hein, who is the expert for the City, he disagrees and says well, that analysis is too conservative and that friction is within the norm in Ontario.

My point is is that friction is not changing, but if we go to -- let's just go to a different document, Registrar. Let's go to the roadside safety assessment. That is the Hamilton 54495. Can we please go to page 10 which I think is image 16. It's section 3.1.5, collision by location. Thank you.

So this evidence is in various places and I'm assuming, Mr. Brownlee, that you've looked pretty closely at the location of accidents, haven't you?

A. I think I was looking at different plots in the -- potentially in the CIMA report but yeah, I do see there's a trend here, yeah.

Q. So my -- just a point to the obvious here, is that around the area Greenhill to King and King particularly in the

mainline you've got location of accidents being quite high on this area which we just looked at where there are significant number of geometric challenges?

A. Yes.

Q. So you've taken us through the evidence -- Registrar, you can take that down, thank you.

You've taken us through the evidence of the factors which create expectancy violations on the Red Hill in this area, Greenhill, King, Queenston. The friction -- and we've looked at that and it's clear that that overlaps with significant numbers of accidents, correct?

A. Sorry, I missed that last combination.

Q. The location that I've taken you through which has the high number of expectation violations in the geometry speed that we've gone through in some detail also correlates with areas in which there are significantly higher numbers of accidents, correct?

A. That is correct, yes. Some correlation for sure.

Q. I've taken you to Dr. Flintsch's evidence that the friction doesn't change in those areas, right? So -- and I just want to dig into your conclusion in your report identifying surface friction as the primary contributing cause to the high -- an overrepresentation of whether -- crashes. Friction is not changing so I don't understand how you get there. Do you say that friction should be the primary contributing cause?

A. To wet weather collisions -- or, sorry, wet road collisions, yes. So the reason we're seeing that specific trend in those areas is that's where the greatest demand for friction is. When you're travelling along a straight road section with a relatively gentle grade you're not starting, stopping or turning. When you get into more challenging topography and you want to change lanes and there's others that are doing the same, that is where you're going to be demanding the friction.

The expectancy violation is that during what we consider routine weather conditions, not snowstorms and freezing rain and things of that nature, we have motorists that feel

they are travelling at an appropriate speed and being able to negotiate curves at a -- based on their experience and their expectations in those cases are being challenged.

Q. And that's because the consequence of the expectancy violations in those locations is that there's a very high demand on friction?

A. There's a higher demand on friction when you're going around curves and when you're dealing with interchanges, yes.

Q. Thank you for your patience, Mr. Brownlee. Those are my questions.

A. Thank you.

JUSTICE WILTON-SIEGEL: If I can try -- not trying to put words in your mouth, but effectively you're saying that in those areas use of the threshold of FN30 may not be appropriate because in those areas the friction demand that a highway should respond to would be higher. Is that fair?

THE WITNESS: In general, yeah. I mean, motorists are travelling at speeds that they feel are comfortable for their vehicle, that they have had in the past. When they are

dealing with trying to stop for slowed vehicles to jockey around a vehicle entering onto the highway they are going to be demanding friction and they sort of have an expectation of what that is and the risks they are going to take in terms of how close they are following other vehicles, how aggressive they might turn to get off of a ramp that they didn't realize was happening so quickly, and that would be the expectancy violation that their vehicle doesn't handle like it should because of reduced friction values in part.

JUSTICE WILTON-SIEGEL: Put another way, given the way a driver would be expected to negotiate these areas, that includes speed in particular, you're saying the demand for friction would be higher because there may be more stops and starts or weaving and turning --

THE WITNESS: That's correct. I'm sorry.

JUSTICE WILTON-SIEGEL: That's what you're saying.

THE WITNESS: Yes.

JUSTICE WILTON-SIEGEL: Thank you. Give me just a moment to make my notes. And broadly, if I understand your evidence, there are

two principal factors. One would be, if I can lump them all together, other driver behaviour, weaving, slowing down, congestion which might involve stopping and the like, and the other would be issues specific to a particular motorist that translate into shorter stopping or sight distances and related issues of geometry, negotiating a curve -- upon entering from a curved on-ramp and similar instances. Is that broadly correct?

THE WITNESS: Yes.

JUSTICE WILTON-SIEGEL: Okay, thank you.

MR. LEWIS: I believe Mr. Chen is up next.

MR. CHEN: Thank you, Mr. Lewis. Commissioner, may I proceed?

JUSTICE WILTON-SIEGEL: Yes, please do, Mr. Chen.

CROSS-EXAMINATION BY MR. CHEN:

Q. Mr. Brownlee, I'm one of the lawyers for the City of Hamilton. If we could just start kind of going back to the understanding with respect to the guidelines, and I wanted to clarify some of those points.

I take it you would agree,

Mr. Brownlee, that the MTO design guide are not guides that municipalities are required to follow.

A. They can choose to follow them. It's the provincial manual, and some choose to apply that manual, others choose to apply other standards and guidance.

Q. And they are therefore guidance. I think that's word you just used?

A. Yes.

Q. Those guides provide what may be typical or the beginning points of a particular design criteria?

A. Yes.

Q. And within that parameter there may be design exceptions?

A. For sure, yes.

Q. And so a particular design criteria would allow for exceeding or deviating from what is typical?

A. Yes, if properly assessed and built into the design, overall design, yes.

Q. And so when we talk about properly assessed, these guidelines permit engineering judgment to be applied to address constraints or obstacles that may arise when

you're applying it to the real world, I think is a word you've used?

A. Yes, that's what I've said.

Q. Adjust to real world conditions, something to that effect, right?

A. Yes.

Q. And it's not always the case that one framework would fit every roadway?

A. No, there's going to be, yeah, variations through your design.

Q. Those are the points I wanted to clarify for the guidelines.

Now, turning to design speed. In your report, and we can bring it up, it is image 6, EXP192. Image 4, sorry about that. Here you talk about the MTO design guide in the context of the roadway speed, and in the first paragraph through say the guide -- in the third line -- the guide does not provide prescriptive guidance on selecting or posting speed limits. Do you see that?

A. That is correct.

Q. And then we can agree that the 1985 MTO design guide was the governing

design document for the Red Hill when it was designed?

A. That's my understanding, yes.

Q. In that guide it provides a general guidance and ranges for selecting design speeds and posted speeds?

A. It provides general guidance.

Q. Doesn't provide prescriptive guidance on selecting or posting speed limits?

A. It provides a range of values that can be provided, and then it provides additional guidance on top of that.

Q. Right. So this kind of goes back to applying a professional engineering judgment in terms of what value, what speed limits to use based on the guidance?

A. Yes.

Q. And so it's recognized that there may be circumstances in which the general guidance set out in the design guide simply can't be followed?

A. There might some

geometric challenges, topography, other constraints on a project where you may not be able to -- for the entire section or very specific areas not be able to meet that standard.

So there's a number of ways of dealing with that is to look at the overall design and the design speed that you're going to choose, or to design a specific component to a lesser value and sign and market it and provide warnings.

So that's the two ways that a transportation practitioner can deal with areas that are particularly challenged.

Q. Understood. But here, as I understand it, you'll agree that the 100 kilometres per hour design speed, it was within the range of the design speed identified for freeways?

A. It was in the range that was permitted, yes.

Q. And as I recall your evidence on Friday, you're not challenging the engineering judgment of the planners of the Red Hill?

A. No, I wasn't there and I don't know what -- I can read what some of their

challenges were, but I -- can't appreciate all the different pieces that they were trying to incorporate into the design while meeting some other high priority criteria for the community.

Q. And then in your report you talk about CIMA and their recommendations and their understanding of the design speed. If we can turn to image 6, please.

So you say in that first paragraph, fourth line, "If CIMA have been advised of the actual design speed they would have identified the significant disparities between the posted, design and operating speeds, and potentially adjusted their assessment scope, assumptions," and so on; is that correct?

A. Yes.

Q. So just looking at table 5, which is right below that paragraph, RHVP operating speeds, the first row states that the average speed of the Red Hill northbound is 95 kilometres per hour and southbound is 99 kilometres per hour, correct?

A. Yes.

Q. And you would agree with me that the change in the assumed design speed

does not impact the average speed identified in that first row?

A. Well, the average speed is something that's measured in the field so -- I'm not --

Q. If there's a change in the design speed that first row, doesn't affect the numbers the first row?

A. It would impact the way you would perceive those numbers. If you have 110 kilometre design speed and you have 50 percent on average roughly doing less than that, that doesn't cause you too much concern. If now you are dealing with 100 kilometre an hour design speed, those numbers now you have 50 percent of the people that are approximately getting close to exceeding that.

Q. That's a separate explanation for a different question. All I'm asking you is these two numbers in the first row will not change. I think we agreed on that. I think you're telling me how they are perceived. I'm just asking you if these number would change if the assumed --

A. They wouldn't change

to -- those are based on what road users are travelling at on the Red Hill Valley Parkway Parkway. They don't know what the design speed is. However, it would change how somebody completing an operational review or a safety review of that corridor would look at those numbers for sure.

Q. No, I appreciate that is your view.

A. So I think you're looking for the first part, which is road user doesn't know what the design speed is. They are travelling at a pretty close speed of what they feel is appropriate and the average speed that you see there is what is a result of those choices.

Q. So I thought my question was simple. The numbers here won't change if the assumed design speed changes?

A. That is correct.

Q. We're the same page.

A. Okay.

Q. All right. Good. So the second row, 85th percentile speed, it's 110 --

JUSTICE WILTON-SIEGEL: Mr. Chen, I don't know that I would like to

interject, but since I've going have this question at the end and it sort of impacts the line of questioning that you're following, I think I should put it to Mr. Brownlee now.

In the paragraph above, as you pointed out, Mr. Brownlee is suggesting that if -- I'm not suggesting the word change of design speed is correct, I think that's wrong and misleading. If in fact CIMA had been advised the actual design speed as 100 rather than 110 he says that could have affected, among other things, potential remedial actions. And if I understand Mr. Brownlee's analysis, that could then have an impact on the average speed. Is that correct, Mr. Brownlee?

THE WITNESS: Depending on the remedial actions, yes.

JUSTICE WILTON-SIEGEL: Depending on the remedial action. A change in the posted speed or large warning signs or something of that sort.

THE WITNESS: Yes.

JUSTICE WILTON-SIEGEL: So there is an interrelationship here that I think the last question and answer didn't really

address.

MR. CHEN: So Mr. Commissioner, my question was simply, looking at the first row and whether that number would change, if CIMA was aware that the design speed was 100 kilometres per hour.

JUSTICE WILTON-SIEGEL: Right. And as I understood that -- understood Mr. Brownlee's answer to be, the answer is potentially.

MR. CHEN: I understand --

JUSTICE WILTON-SIEGEL: If there had been as a result of that CIMA would have recommended remedial actions which, when implemented, would have affected the average speed then the answer is under those circumstances it could have had an effect.

MR. CHEN: I appreciate Mr. Brownlee is talking about the effect and the recommendations. My question is focused on the table specifically, and as I understand when Mr. Brownlee had indicated that the average speed row is simply setting out the measured speed of the study that was --

JUSTICE WILTON-SIEGEL: Why

don't you proceed with your questions.

BY MR. CHEN:

Q. Am I correct about that, Mr. Brownlee, that the average speed would be providing the measured speed at the time of the -- that's what this table is --

A. Yeah, that's essentially the speed, the average speed of those making choices of their operating speed on the Red Hill Valley Parkway Parkway and most of the motoring public doesn't know what design speed is. They know that they can exceed the design speed by a certain amount within a reasonable margin of safety, but if I asked anybody what the design speed was outside of this script today they probably wouldn't know.

Q. When you say had CIMA known about the design speed being 100 kilometres per hour and you've provided the additional statistic of 33 to 48 percentage of vehicles, perhaps that role would change. But the 85th percentile speed, the average speed, those two are measured speeds, they would have changed?

A. Those are based on what motorists are making choices on, yes.

Q. Right. Then the third row, exceeding speed limit, that shows 60 percent for northbound and 72 for southbound. That's referring to the posted speed limit?

A. That is correct, yes.

Q. And I think we can agree that the correct posted speed at the time, and CIMA knew, was 90 kilometres per hour?

A. Yes, they documented that.

Q. Looking at the last row in this table, exceeding 140 kilometres per hour, that states that over 500 vehicles a day are travelling at speeds exceeding 140 kilometres, correct?

A. That's what it suggests, yes.

Q. Again, this is another line that would not be impacted had CIMA known that the design speed was 100?

A. It's measured but it is a pretty stark contrast to 100 kilometres per hour design speed. 40 kilometres over the design speed would definitely heighten my interest and I think most transportation practitioners.

Q. And it's 50 kilometres per hour, if I have my math right, over the posted speed limit?

A. Heighten attention to that particular component and how it may impact collisions, yes.

Q. And 30 kilometres an hour over the design speed would be also significant, would you agree?

A. I would agree, yes.

Q. We talked about the disparities and -- by looking at rows 1, 2, 3 and 5, we can agree that based on that CIMA would have seen a relatively significant disparity between at least the posted speed and the exceeding 140 kilometres speed?

A. Yeah, yes.

Q. So CIMA would have had all that information and could have taken that into account when developing the recommendations that they made in the 2015 CIMA report?

A. They would have taken into account or they may have paid attention to more specific things, such as geometry, knowing that some of the components were designed to --

right down to the minimums of the design speeds of the day. But not everything is based on operating speeds. You're looking at a number contributory factors along this corridor, everything from surface conditions, clear zones, geometry, all those things. So had they been aware of the design speed of 100 kilometres an hour they may have focused on some different areas, including geometry.

Q. I take it we can agree that the geometry on the roadway, the markings, the barriers, they are what they are on the Red Hill Valley Parkway Parkway regardless of whether -- at the time of CIMA doing the assessment, regardless of whether they understood the design speed was 100 or 110, right?

A. Well, if that was what was constructed -- I mean, that's what we're trying to agree on, so it's out in the field, yes.

Q. When it comes to selecting a design speed I take it we can agree that the common practice is the selected design speed of 10, 20 kilometres over the posted speed limit for a paved roadway?

A. Yes, that's -- I've

written that in many reports.

Q. Including your primer. I actually took it from your primer.

A. Yeah.

Q. We can agree that that common practice would be known by CIMA; they have been in the industry for some time?

A. Yes, they would be aware of it.

Q. That common practice is likely why CIMA assumed the design speed to be 110?

A. The common practice of posting higher order roadways such as arterials and freeways 20 kilometres and over is where -- I assume that they made that assumption. Sorry for the double assumption.

Q. No problem.

I take it you agree that it would be fairly obvious that the percentage for those travelling at or exceeding the design speed would increase if the design speed was lower than what was assumed.

A. That is correct, yeah, all else being equal.

Q. You wouldn't expect that the percentage to go down if you lowered the design speed?

A. No, because the operating speed is what it is and -- if you change the other one it's going to change the percentage.

Q. Can we agree that CIMA didn't state in the report that if their assumed design speed is incorrect that their conclusion would change?

A. Generally -- I mean, while we always make provisions in our reports if things change that our conclusions may change, I don't know if you would -- I would have expected them to comment on if the design speed changes. They had an assumed design speed that they were evaluating and that's what they carried through their report. I'm not sure they would -- I've never seen somebody that didn't say well if the design speed changes and the posted speed changes my opinion is going to change. I generally don't see statements of that nature.

Q. Mr. Brownlee, I put it to you that if CIMA was in fact concerned about their conclusions changing because the design speed --

there would be a change the design speed of 100 kilometres instead of 110, they would have identified that to the City in the report going to them.

A. They are working forward on an assumption that they thought was correct. I don't know if they would need to put all those provisos in there for every component of their evaluation.

Q. It was an assumption. It was an assumption. They assumed the design speed?

A. It was assumed, yeah, based on industry practice.

Q. Just moving on the interchange basic, Mr. Brownlee.

A. Yes.

Q. You comment that the majority of interchanges on the Red Hill were spaced less than specified?

A. Yes.

Q. In your report when you say less than specified, you mean that the interchanges on the Red Hill Valley Parkway will have space less than the general guidance in the design guide?

A. That's correct.
Q. And we've agreed that design guide is not prescriptive?
A. That is correct, yes.
Q. And that concept applies to the general ranges for interchange spacing as well, right?
A. Yeah, there's always going to be occasions where you make a deviation for a specific interchange spacing.
Q. And just with interchanges, one of the constraints that may apply is the reality of the locations of the pre-existing arterial roadways by which traffic will access?
A. Yeah. That's recognized in the manual, yes.
Q. And in the case of the Red Hill at the time that it was built the City's system of arterial roads is already in place, or by and large it was in place?
A. Yes.
Q. So not all the roadways, the City roadways, but which traffic needed to gain success to the Red Hill were ideally spaced

at two to three kilometre intervals as a result of that?

A. That's correct.

Q. During your evidence last Friday you were shown a table of the interchange spacing for other urban freeways. I take it you agree that on other urban freeways we've seen cases where they are less than the two kilometres from the MTO design guide?

A. Yes, there are interchanges that are closer spaced, albeit they are not in some cases full interchanges.

Q. Understood. Moving on to the contributory factors topic that you touched on last week and today. So your point relates to the overrepresentation of specific collision attributes for wet weather collisions, correct?

A. Yes.

Q. As I understand it, overrepresentation has a specific meaning in road safety?

A. Yes, it does.

Q. So when you're assessing whether there's an overrepresentation you are looking at whether there is an inordinate

frequency of a specific collision attribute when compared to payer transportation facilities, correct?

A. That is correct, yes.

Q. So just to break that down, of course you -- in order frequency. So can I interpreter that to mean arterial discrepancy of some sort?

A. Yes.

Q. And then when we say specific collision attribute, that could be rear ends, wet weather, that type of thing?

A. Yes.

Q. And then a payer facility would be a roadway or a segment of a roadway with similar characteristics to the one you're concerned about?

A. It could be. There's different comparisons you can make like to the overall experience in a community or within a road network or to very specific attributes that are related to the signalized intersection.

Q. And so the -- can we bring up image 29. It's a bit small, footnote 58, Mr. Brownlee. That's the definition when you

think of overrepresentation?

A. Yes.

Q. Thank you, Mr. Registrar. Throughout this -- we've been using the phrase you want to compare apples to apples. I take it you agree with that?

A. Yes.

Q. If you don't have -- if you don't compare payer transportation facility event, given the definition, you can't conclude that there is an overrepresentation, right, as that term is used in the road safety field?

A. Depending on the analysis and the attribute that you are actually looking at, you can make comparisons without having payer transportation facilities that are exactly the same, like looking at rear end collisions approaching a signalized intersection, is good example.

Q. Right.

A. To have exact same attributes between them and to do a before and after study, if I see 50 percent of the collisions occurring on one approach of a signalized intersection there's something potentially going

on beyond regular motorists' operations. There's geometric or other attributes that are contributing to that specific dominant collision type. I don't need to do a university-based 50-sight evaluation to tell you that's an overrepresented dominant collision type.

Likewise, something more familiar to this. If I see 50 percent, 40 percent wet weather collisions at an intersection on a road section, on a freeway, that's going to peek my interest. That's not something I see every day in my analysis. Do I need a study of peer locations to tell me that that's something pretty substantial? After 25 years, no. That's something that would speak to me right away.

Q. Correct me if I'm wrong but I think what you're saying is that you may not always have the ideal circumstancing. You might not always have the full data segments, correct?

A. Sorry, I misunderstanding the question.

Q. Let me try to rephrase that. We've talked about your definition which is set out in footnote 58, correct?

A. Yes.

Q. When we're doing an overrepresentation analysis we have to at least look at a payer transportation facility, correct?

A. Yeah, system of transportation facilities, yes, so --

Q. Understand.

A. System of transportation facilities, yeah, like a network. And your experience in dealing with other networks and analysis over period of time to look at the dominant -- or the percentages, the distribution of collisions over days of the week, surface conditions, lighting conditions, et cetera. Likewise -- I mean, that's a good example, illumination. If there's a large percent of collisions that are occurring during dark lighting conditions we generally know where that should sit in the grand scheme of things when we're looking at an intersection, or a road section, and whether it's overrepresented or not.

Q. But we can agree that when you're looking at the roads in those networks you should at least have similar characterizations, going back to the apples to apples concept, right?

A. Certain -- yeah, if you're dealing with certain small amounts but there's some that -- yeah, generally you would like to have a good peer transportation facility to compare it to and --

Q. -- yes --

A. -- getting at, yeah.

Q. I think we're on the same page.

A. But do we need the exact replica, 10 different sights to be able to compare that to? Not necessarily. Some of the collision attributes will speak from the data that are inordinately out of the range that we typically would expect them on any component of the road network.

Q. I'm just trying to understand your word, perhaps you can clarify it for me. Your report doesn't provide an overrepresentation analysis of wet weather collisions on the Red Hill, correct?

A. No, we weren't asked to do any independent analysis. We relied on the five-year collision analysis that CIMA had prepared.

Q. I'm a bit confused by -- so you didn't undertake an overrepresentation analysis?

A. No, I relied on others that prepared that on behalf that of the City of Hamilton.

Q. So I know I've seen in the CIMA report reference to provincial and municipal averages. Is that what you're referring to when you say you relied on other analysis?

A. Yes. They looked at the statistical significance between those data sets and the Red Hill, yes.

Q. And those talk about all roads, right? Those provincial averages, they are all roads?

A. That is correct, yes.

Q. You made a reference to various statements of expectancy violations and the Highway Safety Manual on Friday. Do you recall those statements?

A. Yes.

Q. Mr. Brownlee, I take it you have some familiarity with that manual then?

A. Yes, I do.

Q. Could we call that up, HAM64754. Perhaps we can go to image 3. Do you see that?

A. Yes, I can.

Q. Perfect. Just in the first paragraph, A.1, purpose of the HSM. Just generally, do you agree, Mr. Brownlee, that the focus of the HSM is to provide quantitative information for decision making?

A. From a safety perspective, yes.

Q. In other words, it's a way to make data driven decisions?

A. You got the right term, yes.

Q. Just jumping to the next paragraph, be A.2, first sentence says:

"Prior to this addition of the HSM transportation professionals did not have a single national resource for quantitative information about crash analysis and evaluation."

Do you agree with that

statement?

A. Not a single national source, no. The components were spread out, essential.

Q. So this Highway Safety Manual, the Highway Safety Manual was developed in around 2010?

A. Yes, it was.

Q. So you and I can agree that from a timing perspective the Highway Safety Manual was not available as a resource when the Red Hill Valley Parkway was designed?

A. Not in its packaged state but some of the industry knowledge definitely would be in and around then. It didn't just pop up. It's been stuff that was percolated for a number of years and research studies that had been around for years and they were packaged together, in addition to some new research as well.

Q. And I don't intend to take you through the entire 1,000 page manual.

A. I hope not.

Q. There is a history section of how it all came together.

A. Yes.

Q. But if we can go to image 4, the fourth page, make sure I have it right here. Starting at line 77, Mr. Registrar, 77 to 87. If we could call that out.

Mr. Brownlee, starting the fourth line. It says that there's no such thing as absolute safety. I take it you would agree with that general proposition?

A. Yes.

Q. And that:

"There is risk in all highway transportation, a universal objective is to reduce the number and severity of crashes within the limits of available resources, science, technology and legislated mandated priorities."

Is that fair?

A. That's what it says, yes.

Q. Now just turning to one of the purposes of the Highway Safety Manual. As I understand -- we can bring this down, thank you, Mr. Registrar.

One of the purposes of the

Highway Safety Manual is to identify factors that contribute to crashes. Is that one thing it does?

A. Yes.

Q. My apologies, Mr. Registrar, I just meant the call out. If you can bring that document back up at image 238 and 239.

The bottom left of your screen there's a section called contributing factors for consideration. Do you see that?

A. Yes.

Q. It starts with:

"Examples of contributing factors associated with a variety of crash types that are provided in following sections and the examples may serve as a check list to verify that a key contributing factor is not forgotten or overlooked."

Do you see that?

A. Yeah, it says "examples" so it's not meant to be a complete list. I know they quote a check list but it's very high level.

Q. Right. But it does say it's a check list to verify that a key contributing factor is not forgotten. It's not purporting to set out every contributing factor if you read on.

A. That is correct.

Q. If we can turn now to image 240. This shows Exhibit 6-3, possible crash contributing factors along roadway segments.

A. Yes.

Q. If we go down one, two, three, four, crash type, you see wet pavement?

A. Yes, I do.

Q. It lists out four possible contributing factors?

A. That is correct, yes.

Q. The first one is pavement design, e.g., drainage and permeability; second is inadequate pavement markings; third is inadequate maintenance; and the fourth is excessive speed.

A. Correct.

Q. That's what you see?

A. That's what I see.

Q. And we can agree that friction is not listed as one of the key

contributing factors that the HSM has identified?

A. Well, the AG does not contain it only to those two factors they are putting in there. Pavement design, you've heard from Mr. Flintsch, includes pavement friction, includes drainage and includes permeability, cross slope, a whole lot of things. So I realize that somebody that isn't within the road safety field, or hasn't been very long, may construe that to be strictly drainage and permeability, but I can guarantee you that a transportation practitioner with sufficient experience when they look at wet pavement conditions as being overrepresentative would not turn their mind away from the surface conditions.

Q. I take it you're referring to me when you were talking about someone not in the industry. But perhaps I can point out to you that in this particular exhibit you'll see the reference to slippery pavement as a separate --

A. -- yes.

Q. You agree with that?

A. Yes. And one of the areas that it's identified is single vehicle run

off the road collisions.

MR. CHEN: Mr. Commissioner, if I can have five minutes to have a look at my notes?

JUSTICE WILTON-SIEGEL: By all means. It's 12:35. We'll return at 12:40.

--- Recess taken at 12:35 p.m.

--- Upon resuming at 12:41 p.m.

MR. CHEN: Mr. Brownlee, just a couple of questions on a different topic.

JUSTICE WILTON-SIEGEL: Go ahead.

BY MR. CHEN:

Q. Mr. Brownlee, you talked about the concept expectancy violation and in particular with respect to design speed.

A. Yes.

Q. Just to go back. When we talk about expectancy violation we're referring in part to the expectation of drivers that are formed by what they see on the roadway and the environment; is that correct?

A. Yes.

Q. So that would include things like curvature as an example. You see the

curve coming up so you process that?

A. Yes.

Q. And is it fair to say that a driver forms an expectation of how fast they should be driving on a given roadway based on what the see around them?

A. Yes. The alignment of the roadway, the distances on the side, widths of a lane, all those types of things, yes.

Q. So with respect to the speed it's formed -- it's based in part on the physical attributes of the roadway?

A. Yes.

Q. Is it fair to say that a main way of addressing a potential expectancy violation with speed, at least, is to put up speed limit signs along the highway?

A. It assists to a certain extent, yes.

Q. And the posted speed on the Red Hill which we covered earlier, not now but before, was 90 kilometres an hour?

A. That is correct.

Q. And the posted speed on 400 series, that's typically 100?

A. Yes, it is.

Q. Would repeating speed limit signs along the highway serve as a consistent reminder to the driver?

A. We would hope so, yes, but the motorists still make the decision based on what they think their tolerances are, the conflicts around them, and the roadway environment.

Q. But they are there for that purpose?

A. They are there for that purpose, yes.

Q. When we're thinking about speed limit signs as providing warning, putting them near or close to physical attributes like a curve, that may also help to manage expectations?

A. If the posted speed is appropriate for that curve and they understand their operating speeds if they can travel through that curve, yes.

Q. In addition to speed limit signs, I take it the presence of speed enforcement would also manage driver expectation?

A. When it's present, yes.

Q. Can we agree that drivers who drive onto the Red Hill Valley Parkway from an adjacent highway would encounter a road sign that says Red Hill Valley Parkway?

A. Potentially they may. I'm not sure. I haven't done an evaluation of the guide signs but...

Q. Well, all I'm saying is a driver knows that they are entering the Red Hill Valley Parkway.

A. I actually don't know if they have signs that say Red Hill Valley Parkway. I apologize.

Q. Fair enough. Just before I leave that point, a sign that says -- whether it's the Don Valley Parkway or the Red Hill Valley Parkway, that may be something that impacts the expectancy of the driver?

A. I don't think a road name is going to change their opinion. Most people don't know if they're driving on a provincial highway or a county road. They don't make that distinction. They base it on physical attributes of the roadway and what they feel is appropriate for the conditions they are driving through and

any kind of hazards they may encounter and what the appropriate operating speed is. They are going to take into account the posted speed in that evaluation but it's only one of the considerations.

We see it on freeways where they've got an 80 kilometres per hour posted speed for construction zone. I challenge you to find anybody who is doing 80 kilometres an hour if there is no pertinent reason, geometric feature or operating condition that's going to make them change their speed.

Q. But if the sign is there that says Red Hill Valley Parkway, that forms -- and they see it, that forms part of their expectations, correct?

A. Potentially if they live in Hamilton or they watch the news, but anybody who's not familiar with Hamilton I would be challenged to -- for them to understand there is actually Red Hill Valley Parkway and it has a certain difference than other freeways that they would drive on on a regular basis. The motoring public is not that knowledgeable, I don't think, unless, as I said, you're local to the area.

Q. I would like to give them a bit more credit than that. Someone who sees a sign that says Red Hill Valley Parkway is not going to think they are driving on like a 400 series, right?

A. It looks like a 400 -- it's a controlled access freeway which has a certain flavour to it. They don't need to worry about stop signs and traffic signals, they have interchanges that would be coming up and would be well signed so they have advance warning, they are going to select a speed that they feel comfortable under a controlled access freeway environment.

Q. And along the Red Hill Valley Parkway, and we've touched on this, there are certain notices and markings or speed limit signs that are doing what they are supposed to do in terms of providing notice?

A. They're definitely notified that it's a 90 kilometres per hour posted speed, yes.

Q. It's not -- is it fair to say it's not an individual sign, it's kind of the cumulative effect or the combination of different signage and markings that can work together to

manage expectations; is that fair?

A. I'm not sure what markings you're referring to.

Q. I just mean the speed limit signs being repeated, speed enforcement, seeing that a curve is coming up. When we talk about driver expectation we're not focused on a singular effect, we can also think about it in a cumulative effect.

A. Yes, they are taking all those things into consideration as they're driving down roadway and selecting their speed.

Q. Thank you, Mr. Brownlee, those are my questions.

JUSTICE WILTON-SIEGEL: Mr. Lewis?

MR. LEWIS: I don't have any questions.

JUSTICE WILTON-SIEGEL: Well, then, I take it that we're through for the day and we'll adjourn until tomorrow at 9:30.

Before we go, thank you Mr. Brownlee for attending yet again. I gather you may still be required on Thursday. So we'll wait to see whether there's any further testimony

we require from you, but in the meantime thank you very much for your assistance and your testimony. We'll stand adjourned then until 9:30 tomorrow morning. Thank you.

--- Whereupon at 12:50 p.m. the proceedings were adjourned until Wednesday, February 22, 2023 at 9:30 a.m.