

Ottawa Light Rail Commission

Glen McCurdy
on Wednesday, May 4, 2022



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OTTAWA LIGHT RAIL COMMISSION

GLEN McCURDY

May 4, 2022

--- Held via Zoom Videoconferencing, with all
participants attending remotely, on the 4th day of
May, 2022, 2:00 p.m. to 5:19 p.m.

1 COMMISSION COUNSEL:

2

3 Christine Mainville, Counsel Member

4 Carly Peddle, Commission Counsel Member

5

6 PARTICIPANTS:

7

8 Allison Russell, Esq., Kelly Santini LLP

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10

11 ALSO PRESENT:

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13 Eveliene Symonds, Stenographer/Transcriptionist

14 Alicia Sims, Virtual Technician

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1	I N D E X	
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3	WITNESS:	GLEN McCURDY
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6	INDEX OF EXHIBITS	
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8	NUMBER/DESCRIPTION	PAGE/LINE NO.
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1 -- Upon commencing at 2:00 p.m.

2 GLEN McCURDY: AFFIRMED.

3 BY MS. MAINVILLE:

4 1 Q. Mr. McCurdy, the purpose of
5 today's interview here is to obtain your evidence
6 under oath or solemn declaration for use at the
7 Commission's public hearings. This will be a
8 collaborative interview such that my co-counsel,
9 Ms. Peddle, may intervene to ask certain questions.
10 If time permits, your counsel may also ask
11 follow-up questions at the end of the interview.

12 The interview is being transcribed, and
13 the commission intends to enter the transcript into
14 evidence at the commission's public hearings either
15 at the hearings themselves or by way of procedural
16 order before the hearings commence. The transcript
17 will be posted to the commission's public website,
18 along with any corrections made to it after it's
19 entered into evidence. The transcript, along with
20 any corrections, will be shared with the
21 commission's participants and their counsel on a
22 confidential basis before being entered into
23 evidence.

24 You'll be given the opportunity to
25 review your transcript and correct any typos or

1 other errors before the transcript is shared with
2 the participants or entered into evidence any
3 non-typographical corrections made will be appended
4 to the transcript.

5 And, finally, pursuant to section 33
6 sub (6) of the Public Inquiries Act 2009, a witness
7 at an inquiry shall be deemed to have objected to
8 answer any question asked of him upon the ground
9 that his answer may tend to incriminate the witness
10 or may tend to establish his liability to civil
11 proceedings at the instance of the Crown or of any
12 person, and no answer given by a witness at an
13 inquiry shall be used or be receivable in evidence
14 against him in any trial or other proceedings
15 against him thereafter taking place other than a
16 prosecution for perjury in giving such evidence.
17 And as required by Section 33 sub (7) of the act,
18 you are advised that you have the right to object
19 to answer any question under Section 5 of the
20 Canada Evidence Act. Okay?

21 A. Okay.

22 2 Q. So we can proceed. Could you
23 start by explaining your involvement in Stage 1 of
24 what Ottawa's LRT project?

25 A. Sure. So I was -- I'm -- my

1 employer is Parsons Corporation, and under the
2 scope of work that Parsons has with the City of
3 Ottawa, I was asked to contribute to the program
4 starting in 2017 as a subject matter expert for
5 train controls, operations, system integration
6 testing and a variety of things as well as system
7 installation monitor, because it was prior to
8 the -- it was during the stage at which the control
9 systems were starting to get connected and
10 deploy -- we were getting deployed to the field and
11 connected.

12 And so I was brought in to support the
13 Light Rail Systems Operations office -- LRSOI, it
14 was called. It's now called the Rail Construction
15 Program. So effectively the construction side of
16 the City of Ottawa overseeing the construction of
17 the Confederation Line Stage 1 and to provide, you
18 know, on -- on-call and as-needed support,
19 commentary, and oversight to the program in
20 whatever way that the City needed for going
21 forward.

22 3 Q. Okay. And who were you reporting
23 to?

24 A. I was receiving tasks from Richard
25 Holder and Eric Dubé at the time.

1 4 Q. Who was Eric Dubé?

2 A. Eric Dubé was the -- he's now a
3 project manager -- City of Ottawa rail construction
4 program, and he was the -- at the time, he was --
5 his role was group lead for systems and vehicles, I
6 guess is the title now. Now he's a manager of a --
7 I think that still what he's doing. He remains in
8 that role for the extension program or similar
9 role. I imagine he's already been --

10 So he works -- he was in the department
11 headed by Richard Holder and by the director of --
12 and they reported to the director of the rail --
13 LRSOI program, and his name escapes me at the
14 moment.

15 5 Q. And did you say you were also
16 subject matter expert in operations or...

17 A. Yeah, my -- not -- like, at -- at
18 the time, that wasn't the role, because we -- you
19 know, Tom Fodor and Mike Palmer were brought in to
20 specialize in the operations side of it and the
21 operations maintenance side of it. I was more on
22 the train controls integration testing and
23 oversight and providing advice to the City.

24 6 Q. Okay. And when you say "Mike,"
25 you mean Mike Palmer?

1 A. Yeah, Mike Palmer. Yeah, so he
2 was brought in to -- as part of the team on the --
3 on the operations and maintenance focus.

4 7 Q. And --

5 A. But we're all part of an
6 integrated team. So every -- every -- you know,
7 how the function works and who uses it, they're
8 always kind of working hand in hand on issues.

9 8 Q. And was Parsons already involved
10 in the project before you began in 2017?

11 A. Yes, they were.

12 9 Q. Okay. And so what was Parsons'
13 role generally on the project?

14 MS. RUSSELL: Sorry, counsel, I just --
15 if I can just interrupt? If the question to
16 Mr. McCurdy can be specific to his time and his
17 knowledge while he was at -- while -- once he
18 joined the project at Parsons, I would appreciate
19 if the question could be more specific in that
20 regard.

21 MS. MAINVILLE: Sure.

22 BY MS. MAINVILLE:

23 10 Q. Well, I would like to have your
24 understanding of generally Parsons' role on the
25 project, and then you can be specific to what you

1 directly observed in that regard?

2 A. Yeah, like, I would defer to my
3 manager Mr. Hulse and his view on it, because he
4 had oversight as to what everybody else's role was
5 doing.

6 11 Q. Okay.

7 A. And so my role was in support of
8 it honestly by task order with the City to provide
9 expert advice and commentary and to -- to them on
10 an as-needed basis. So that was -- that was the
11 role of Parsons on there.

12 And that is understandably very
13 flexible in this type of a program, because the --
14 you know, a lot of things develop on there, and --
15 and it's hard to foresee, you know, five years
16 prior to the integrate -- you know, the integration
17 stage, you know, where you need to direct your
18 focus and what you need to do.

19 So they brought in -- they brought
20 in -- so I was basically on call, and I did
21 multiple roles that was in response to what was
22 going on in the field and as the project moved
23 through stages, right? So we did the install
24 stage, then the -- and then sub system testing and
25 all the way through.

1 12 Q. And so you also reported
2 internally within Parsons to your manager,
3 Mr. Hulse?

4 A. Yes, I did.

5 13 Q. How -- do you know how large the
6 Parsons team was approximately during your -- as of
7 the time you were involved?

8 A. The Parsons team for the City of
9 Ottawa worked -- we had enter -- many people were
10 only halftime, right, and we moved on and off
11 throughout the programs.

12 So when I started, it was primarily
13 myself, and John was working part time. And then
14 as we moved -- and then as more part of the project
15 came online, like we started testing and the
16 maintenance started and things like that, then
17 other people from Parsons came on to augment the
18 team.

19 14 Q. Okay. And were you embedded at
20 the City?

21 A. I had a desk at the City, and I
22 worked there about three -- three days a week.

23 15 Q. Okay.

24 A. So I worked on the program five
25 days a week, and I was up in the City office about

1 three -- three days.

2 16 Q. Okay.

3 A. Support of meetings and
4 conversations and in-person -- in-person reports.

5 17 Q. Okay. And did you work with STV?

6 A. No, I wouldn't say I worked with
7 them. I worked near them.

8 18 Q. What did you understand -- what
9 did you understand was the difference between the
10 two roles?

11 A. They had a different focus. Like,
12 they -- they -- they brought in -- it was part of
13 the Capital Transit Partners I think was the term
14 they used, CTP Group, and they had a different
15 contract, different scope of work.

16 So they were looking -- you know, I
17 understand their work was, you know, largely on the
18 architecture side and on the vehicle -- and on some
19 of the vehicle side. But I really had no -- I had
20 no insight into their scope of work or their
21 responsibilities.

22 But my work was clear on the train
23 control and the -- and the operations and how the
24 train -- how the train control was being used. But
25 I -- I didn't get into the vehicle side, so that

1 was for STVs. I had teams on there that worked on
2 vehicle focus areas.

3 19 Q. Okay.

4 A. My scope kind of stopped at the
5 train control. They were part of the Capital
6 Transit Partners contract consortium group, CTP
7 Group. But, again, I was only tangentially
8 associated -- working with them.

9 20 Q. Okay. And what is Parsons'
10 expertise, or what is the company about, if you
11 could just give us that?

12 A. Okay. Yeah, Parsons is a large
13 company. We -- we have -- in our group, our focus
14 is rail transit. So rail transit operations,
15 project integration.

16 And so, yeah, so we've been providing
17 on-call technical expertise to rail-associated
18 programs, prior contracts and customers in
19 Washington Metro, TTC Metrolinx, as well as
20 San Francisco Bay area transit, Vancouver transit.
21 And we've also worked for Kawasaki-Hitachi
22 partnered with Alcatel for some programs and
23 provided oversight in others. And also provided
24 oversight integration of train control systems on
25 other programs such as Chicago O'Hare APM and on

1 down the list. But our focus -- John Hulse's group
2 focusses on rail transit, operations integration,
3 quality, and delivery. And --

4 21 Q. And sorry, did you --

5 A. I --

6 22 Q. Sorry, keep going.

7 A. Go ahead. But we're flexible to
8 what the customer -- what the customer is asking
9 for.

10 23 Q. And, sorry, did you say you worked
11 with Thales?

12 A. I -- Thales, T-H-A-L-E-S?

13 24 Q. T-H -- yes.

14 A. Not Telus, Thales. Yeah, so I
15 worked -- in 2010, I joined Parsons. And prior to
16 that, I was a project systems engineer lead at
17 Thales. So I have 10 years' experience with Thales
18 as to the sort of the highest technical level of
19 project responsibility scope. I was lead systems
20 and lead design authority for two programs when I
21 concluded.

22 25 Q. Okay. And I was just about to ask
23 for your background and experience. So could you
24 tell us a bit more about that?

25 A. Okay. So, yeah, so my bachelor's

1 degree in engineering physics, two years sort of --
2 two years' experience with Queen's University.
3 After that, (audio glitch) with Allied Signal
4 Aerospace -- now Honeywell -- on embedded -- on
5 embedded environmental controllers for commercial
6 aircraft -- Boeing, triple sevens, things like
7 that -- doing software in software systems.

8 Then from there, I worked -- I joined
9 Alcatel, now Thales, around 2001, yeah, around
10 2000, yeah, '99. '99/2000, I joined Alcatel and
11 went through multiple roles there both as a
12 contractor/builder, working on commercial proposals
13 and then on the design and then the project
14 deployment. So I rose to the -- I was a lead
15 systems engineer and project systems engineer.

16 And then I put up -- I worked on two
17 programs, Las Vegas Monorail and Dulles APM. And
18 at the end of the testing phase for those programs,
19 I transitioned. I got the opportunity to join
20 Parsons.

21 26 Q. And so, sorry, when did you start
22 with Parsons?

23 A. 2010.

24 27 Q. 2010. Okay. And when you say you
25 were involved on this project in respect of the

1 train controls, do I take it it was in respect of
2 Thales's signalling system?

3 A. Yeah, for the oversight, right?
4 So I was one of the -- one of the items that the
5 City requested some expertise on was providing
6 oversight of the train control system. And so my
7 experience in that dovetailed well.

8 28 Q. M-hm.

9 A. Because the City had a lot of
10 experience on, you know, bridge building and power
11 systems and sewage, you know, City municipal
12 structures. But things like networks and train
13 controls is a very industry-specific item.

14 29 Q. Okay. And when you arrived,
15 was -- what would you say was the state of play at
16 that point in time in respect of the train control
17 system?

18 A. The program was still being --
19 under construction would be the word. So 2017, the
20 track was still being bolted onto the -- onto the
21 rail, and the tunnels were still being built. They
22 had effectively just got two vehicles running and
23 some first rough layouts of the -- and they were
24 installing the wayside -- the wayside control
25 systems into place. So the boxes were going on the

1 walls, the cables -- the wiring -- the wirings were
2 being hooked up.

3 30 Q. Okay. And so what was your role
4 at that point in time?

5 A. At that point in time, it was
6 installation monitoring. So as the electrical
7 installers were going through with the boxes,
8 putting them on, I was basically, you know, sort of
9 doing a daily site visit, going into the control
10 rooms, counting the progress for installing the
11 radio units, the signalling equipment on the
12 wayside and onboard and then providing my advice to
13 the rail construction program on the progress,
14 tracking their progress versus the schedule. So
15 what they said they were going to do that week to
16 say what did they actually do and try to provide
17 contact -- try to provide advice to the rail
18 construction program managers --

19 THE COURT REPORTER: To the -- sorry?

20 THE WITNESS: -- so they have an
21 oversight as to how things were going, are they on
22 schedule, behind schedule.

23 THE COURT REPORTER: To the who?

24 THE WITNESS: To the -- sorry, we call
25 it RCP now, Richard Holder, really, and the -- and

1 the City of Ottawa construction branch.

2 THE COURT REPORTER: There was a word
3 that you said, and I wasn't sure what it was, but
4 that's okay, we'll pass.

5 THE WITNESS: No, yeah, sorry, I keep
6 tripping over the acronyms, the -- because they
7 have the construction group, which is the LRSO --
8 Light Rail Systems Operations and then OC Transpo,
9 which is the operator side. So they -- they were
10 sort of two groups, but the construction of the
11 program was under the construction group.

12 BY MS. MAINVILLE:

13 31 Q. Now, you say you were brought in
14 in part in respect of systems integration.

15 A. Yeah.

16 32 Q. But you said your role stopped --
17 or did not involve the vehicle side. So --

18 A. Right.

19 33 Q. -- do I understand that you
20 weren't overseeing the integration between Alstom's
21 trains and the signalling system?

22 A. Correct. I was not able to
23 scrutinize that as much as I would like.

24 34 Q. And why is that?

25 A. I didn't have the information. It

1 was the -- the vehicle -- yeah, I just didn't have
2 the information, was -- I wasn't invited to it, and
3 the troubleshooting of the vehicle and speed
4 control, it was always an ongoing thing internally
5 between the two companies. And many -- and they
6 didn't really sort of share their progress.

7 35 Q. So when you say you didn't have
8 the information, did you typically receive your
9 information from the City or directly from the
10 subcontractors?

11 A. I really had to find everything on
12 my own. The -- we received -- sorry, as well as we
13 received some submissions from the -- through RTG
14 that were delivered through the City as a formal
15 design submission or CDRL -- commercial document --
16 or CDRL, I forget the term of it -- but they would
17 submit and leave comments on it.

18 The details of the vehicle controller
19 interface to vehicle was not provided as a
20 submission for comment. It was deemed to be, you
21 know, an internally -- item.

22 36 Q. And --

23 A. But I -- but it deemed to be
24 internal to the -- to the -- to the projectco.

25 37 Q. Okay.

1 A. I think we eventually got a copy
2 later on, but at that point, it was all done.

3 38 Q. So it wasn't the case that when
4 you came in, this piece of integration with the
5 vehicle was not part of your scope; it was more
6 that you were not able to perform it?

7 A. Let me clarify. The -- I was to
8 look at the end report on the progress of the
9 installation, the testing, and the delivery,
10 provide insight as to what are the risks, what are
11 the delays, what are the potential delays to the
12 program in terms of meeting this -- in terms of
13 being able to deliver on time.

14 The part of that -- and then so what
15 that entails was kind of left you know sort of do
16 what you need to do. And so part of that is
17 looking at the risk of -- of multiple things.

18 I wasn't going to try to scrutinize the
19 details -- the two pieces of the vehicle talking to
20 each other onboard. I wasn't going to get to that,
21 because that was their responsibility to make it
22 work the best way they could.

23 So I didn't have the details, but I
24 also didn't want them. I -- they just had to make
25 it meet the -- they had to make it function. And

1 so I was trying to oversee -- provide the City
2 advice on how well they were progressing to make it
3 all function properly, you know, as it goes,
4 because the nature of this project as well as many
5 projects was that they deliver the hardware to the
6 field sort of in a rough state and then the
7 software to the field in a rough state and then
8 improve the -- improve the software functions with
9 the real equipment on site.

10 And the vehicle and the train control
11 soft -- like, the computer -- like, the software
12 side of it really started talking to each other
13 directly first time on site in the City, because
14 the City -- because the vehicles are being
15 manufactured there, the test track was there, and
16 so they -- they were -- they were developed.

17 And the Alstom vehicle, this vehicle,
18 and this train control system were built into --
19 into -- by two separate factories by two separate
20 companies. And the first time they touched each
21 other was in the city on the test track, and that
22 is typical of programs like this.

23 39 Q. And you said you were mostly --
24 well, I don't want to put words in your mouth, but
25 I understood you to say you're tracking potential

1 delays, whether they were going to be able to
2 deliver on time. Was that more the focus as
3 opposed to whether the systems were being properly
4 integrated or whether there were gaps that could,
5 in fact -- reliability or other performance issues?

6 A. The question -- the main role was
7 to provide -- and -- and the question to -- sorry.
8 The reports that I provided to -- to the
9 construction office were focussed on delivery to
10 schedule. That was the question they asked. Are
11 they -- are they delivering to schedule?

12 The next question is what are the
13 risks? Right? So what happened last week? What's
14 can happen next week?

15 And then what are -- what's -- what's
16 my assessment of any risks to the schedule? Like,
17 if -- so part of that is looking at is it -- are
18 things falling behind? Is there a -- is there a
19 bug that is -- you know, that they're trying to
20 troubleshoot? Is there -- are there any other
21 technical things?

22 So it was mainly on delivery to
23 schedule, delivery to -- but then also open to
24 anything else I -- I found out and wanted to raise
25 as note as a, you know, potential thing to look out

1 for or ask for more information on or just to track
2 to see if it gets resolved the next week, right?
3 So pretty open -- open definition to free -- free
4 to identify any concerns and raise them.

5 40 Q. Right.

6 A. Yeah.

7 41 Q. But I take it, then, the City's
8 primary focus was own timely completion of the
9 project?

10 A. Yeah. Timely and complete. So it
11 was on the time; it was also on the -- the
12 suitability, right? So it was you could have it
13 all done, but it's got to be up and done and
14 working. So both on the quality and on the
15 schedule. So is it -- is it in there as per the
16 schedule that the projectco said they were going to
17 do? Like, if they're going to have this much done
18 on this day -- you know, like a week before that
19 day, are they 80 percent there? And then is the --
20 are the tests being passed? Are they good quality?
21 Are things being done properly and on the way?

22 42 Q. Okay. So you were keeping an eye
23 or trying to track --

24 A. Trying to track.

25 43 Q. -- the quality of the work?

1 A. Yeah.

2 44 Q. Okay.

3 A. So I was keeping an eye on was it
4 getting done and was it done well and complete?

5 45 Q. Okay. And because you said your
6 reports focussed on delivery to schedule, but I
7 take it, then, they would also address quality
8 issues?

9 A. Yeah. So any -- delivery means
10 delivery and it's working.

11 46 Q. Okay.

12 A. As well as -- but sometimes
13 delivery is just putting a -- putting a box on a
14 wall, so just like this many boxes, this many
15 walls. But then when the whole thing got powered
16 up and put together, you know, is it doing
17 everything we need? Are all the systems they need
18 to talk talking and whatever else is needed?

19 47 Q. Right. Okay. So who did you
20 understand was overseeing this work on the project
21 company side?

22 A. Projectco side?

23 48 Q. The -- and when I say this work,
24 let's start with the -- the integration of the
25 vehicles with the signalling system.

1 A. Yeah, that responsibility was with
2 OL -- OLRTC, I believe it was.

3 49 Q. M-hm.

4 A. OLRT constructors, which was a sub
5 group of the Rideau Transit Group.

6 50 Q. Was there any person in particular
7 that was overseeing this?

8 A. There was a couple of them.
9 Mr. Bergeron.

10 51 Q. M-hm.

11 A. Frank. His name escapes me at the
12 moment. He picked up -- he picked up the work
13 after that. And Mathieu Branconnier. Yeah. Yeah.
14 Mat -- Mathieu Branconnier --

15 52 Q. Okay.

16 A. -- was testing on the vehicle
17 side. Jacques Bergeron was integration for
18 SNC-Lavalin and on -- on the side of the vehicle
19 and the way-side systems.

20 53 Q. M-hm.

21 A. And then Frank -- I'll have to
22 look his name up. Yeah, but he was for OLRTC as
23 well.

24 54 Q. That's fine. So were you -- you
25 were free, I take it, to speak to these individuals

1 and seek information from them?

2 A. Yes. And they were my primary
3 sort of interface as to -- as to -- as to call up
4 the -- the interface manager and ask for -- ask for
5 information.

6 55 Q. Okay. And so do I take it you
7 sought information from them about this interface
8 and integration?

9 A. Effective -- effectively it was
10 site visits, right? So when I asked them -- when I
11 asked them for a document, they go, Yeah, yeah,
12 we'll get back to it and kind of didn't really.
13 So -- and when I -- and when I did ask them to
14 provide me information as to, okay, how many things
15 did you install, they said, No, we're not in that
16 job of answering your questions so, you know,
17 figure it out yourself. Okay.

18 So then I went to -- yeah, actually,
19 that point, I put on my hard hat and safety boots
20 and went down to the station where the construction
21 was going ahead. And a lot of the information I
22 was able to -- I gathered was from sort of just
23 sitting in the back of the room while the
24 construction -- while the -- while the construction
25 designers and -- and testing activities were going

1 on. So I -- I would witness tests and installation
2 work as it was ongoing, but I was on my own to
3 collect information from observations.

4 And occasionally we'd have a site tour
5 as part of the certification reporting structure
6 and the -- and I would be -- I would be in meetings
7 and privy to all the -- all the projectco weekly
8 reports, monthly reports, and their status reports
9 and then as to go and do an independent check, you
10 know, in the field to see if they're delivering --
11 see if -- see if what's in the report is what's in
12 the field.

13 56 Q. Okay. And in that context, would
14 you try to interact with Alstom workers or -- or
15 Thales?

16 A. Yeah. So I would be -- I would
17 interact with them. I would be in the room and
18 observe them. So I would interact in a non
19 invasive way. I would ask questions, we'd chat,
20 but I just basically let them -- observe them in
21 their -- completing the testing and integration
22 work.

23 57 Q. Were they more forthcoming with
24 information than the OLRTC people?

25 A. Yeah, because we -- particularly

1 in fields, What are you doing now? Oh, we're just
2 doing this. That's fine. It didn't cost them
3 the -- Rideau Transit Group, if they had a document
4 in hand, they would hand it over. Or if they had
5 some notes, they would hand it over. But generally
6 if they had to write something, that was a body of
7 work they -- you know, they were very busy doing
8 other things.

9 58 Q. Right. They weren't wanting to
10 create more work?

11 A. Yeah, so I would go collect my own
12 information, write my own report.

13 59 Q. Okay.

14 A. But I did it a lot by walking, you
15 know, putting on the hard hat and safety glasses,
16 going into the -- going into the station as
17 constructed, walking the guideway, walking the
18 tunnel, you know, showing up -- showing up during
19 the day what the testing was ongoing and -- and
20 capturing what I could observe.

21 60 Q. Okay. And I take it you had
22 better luck in other areas than the vehicle
23 integration --

24 A. Yeah. The --

25 61 Q. -- in terms of receiving

1 information.

2 A. Yeah. And the vehicles was also
3 not part of my primary focus, right? We had --
4 there was -- there was a team there -- they had a
5 team working on the vehicle side, pretty well
6 populated, but my -- so I didn't -- I didn't feel I
7 needed to -- to sort of be -- you know, that was
8 already well covered, and my focus was on the
9 systems side.

10 62 Q. Okay. So before we move to the
11 systems side, did you have any concerns or -- or
12 identify any potential issues just based on the --
13 the information you had about the vehicle
14 integration piece?

15 A. I provided updates roughly
16 every -- every -- every week or at least every
17 month in -- in written sort of presentation form
18 that was then sent up to Eric and Richard. So
19 weekly -- biweekly construction update as well as
20 comments on submitted documents and feedback on the
21 schedule. So OLRTC would provide a schedule
22 update -- a project schedule on a -- I think, like,
23 a monthly basis, and then I would provide, you
24 know -- and then my -- my reporting to the City was
25 part of a commentary on the project schedule, you

1 know. They'd say, Oh, yeah, we're done this. Are
2 they done this? They said they're done this, but
3 they're not really. And do it on line-by-line
4 basis, and then the information was provided to
5 construction office and then provided in a report.
6 And they -- and they took that and put it in the
7 report back to -- in a feedback to schedule, I
8 think, was the item from there.

9 63 Q. So did you make observations about
10 scheduling concerns relating to the vehicle and
11 CBTC integration?

12 A. Not detailed ones, because the
13 information was kind of limited.

14 64 Q. Okay.

15 A. Right? So I didn't have a
16 detailed test procedure of what they were doing on
17 the vehicle interface. I didn't have a detailed
18 test plan. I didn't have the detailed interface as
19 to how it was supposed to work or how it was
20 working or what the problems were or what progress
21 and testing they were doing. Detailed test
22 procedures were really not provided, so it was --
23 they -- the -- the viewpoint of OLRTC was, you
24 know, this is their job to figure out, "their"
25 being Thales and Alstom. They were going to do the

1 troubling and deliver it.

2 And by and large, having done that job
3 15 years before, okay, yeah, let's the guys with
4 screwdrivers get -- you know, sort of hammer it
5 out.

6 65 Q. Did you have any sense of whether
7 these procedures existed, or you don't know?

8 A. I wasn't privy to them. I know
9 from the experience with them that they're --
10 they're pretty rigid on it. But it's always a
11 troubleshooting area. So the early systems go
12 together, they, you know, get them working, and at
13 the end of it, they do a formal check.

14 66 Q. Okay.

15 A. So I know the formal -- I know the
16 formal test exists. Those reports were done,
17 because that was always part of -- when I worked
18 with them, it was part of their own company's
19 quality assurance process. But I was never -- I
20 never saw any of these test procedures or the
21 results of them.

22 67 Q. Okay.

23 A. And I issued a couple RFIs in
24 there going, you know, Can you please tell me what
25 the speed profile is on the guideway as it goes

1 through? And after a year later, they kind of gave
2 me some handwritten note of the -- from the civil
3 designer as to what the speeds they were supposed
4 to follow, but I didn't -- never got an answer as
5 to what speeds they were following.

6 68 Q. And RFI is a request for
7 information?

8 A. Yeah.

9 69 Q. Do they -- is the contractor bound
10 to provide information in respect of those?

11 A. I don't think -- well, they have
12 to respond to them. They don't need to respond to
13 them fully. And, yeah, part of that was, you know,
14 my own -- my own checks to make sure at least
15 somebody was looking at that part of the interface.
16 So does that exist? Do they know what it is? Does
17 the integrator know what it is? That was part of
18 my scheduling oversight. That wasn't really
19 something that was part of my -- it wasn't going to
20 help with the schedule work.

21 70 Q. M-hm.

22 A. Or the -- the delivery schedule
23 report.

24 71 Q. Okay. And did this speed issue --
25 did that have to do with journey times and whether

1 those could be met?

2 A. I would not -- I wouldn't say it's
3 a speed issue, it's a speed question.

4 72 Q. Question.

5 A. And that part is to -- to -- they
6 delivered a simulation report. There's a --
7 there's an end-to-end journey time -- an
8 end-to-end journey time, so that's a bit of an
9 item. That's an item I'd been intimately tracking
10 throughout the program and continue to do so in
11 that the -- that -- and then performance criteria
12 and their simulation report, their predictive
13 model -- and this is -- this is in the submission I
14 think delivered in 2016, right, indicated they
15 could complete the trip in 21.5 minutes, right? So
16 boom, boom, boom. Go from doing -- departure time
17 to Blair is 21.5. They only had to meet 23 as per
18 the number, so I was, like, oh, that seems really
19 fast.

20 And what we noticed was that what --
21 what they predicted in the travel time and what was
22 operating in the field when the vehicles and the --
23 and everything started working together, they
24 weren't matching. It's, yeah, we're going to go
25 from -- say it's a long run from, like, Hurdman to

1 Cyrville in, say, 80 seconds, and suddenly it was,
2 like 85, 90, and they weren't showing up. And
3 it's, like, okay. And we know simulations and
4 realities, you have to allow some numbers, but
5 these were kind of always going in the same
6 direction.

7 And we found that there were areas
8 where, like, what speed they were supposed to go at
9 certain parts of the track, they were changing. So
10 what the preliminary speed along -- like, through
11 the curves like at Hurdman, they're supposed to go
12 through there at a certain speed, and then the
13 trains are going through slower. I was, like,
14 Okay, why's that? And they say, Oh, well, we just
15 set them down. Okay. So you just slowed the train
16 down. Did you -- were you planning on telling the
17 City you were doing that? Was anybody monitoring
18 what the impact of this is? Right? And, again, no
19 real answer on that.

20 So there was some reason why they did
21 that, probably a good reason related to speed and
22 curve and vehicle safety, but they would do -- they
23 would make these changes unilaterally without
24 informing the City. And I would only find out
25 after getting on the train, riding it, and going

1 wait a minute, this train is moving slow. And then
2 I ask, What's the speed? And after some time --
3 again, this is in -- part of our responses in
4 record, that they responded that they slowed --
5 they slowed several areas of the track to slow the
6 track down.

7 Which they had freedom to do, right?
8 As long as they ended up meeting the time -- the
9 total PA and met the end-to-end performance, that's
10 part of their design responsibility.

11 73 Q. Right.

12 A. But I thought it was -- one of the
13 things I raised on it was during preliminary
14 design, they said it was going to do this. When
15 they got to the field, it did something less.

16 74 Q. Which raised questions.

17 A. Still within parameters, but
18 should you -- shouldn't they have, like, you know,
19 said they're doing it or had -- like, ahead of
20 time --

21 75 Q. M-hm.

22 A. -- or check that the impact was
23 there? But that didn't seem to -- that -- that
24 piece didn't seem to be there.

25 76 Q. Did you understand that there --

1 these journey times they had to meet, that there
2 was an issue relating to braking, accelerating and
3 braking?

4 A. No. Once the train was
5 accelerating, it accelerated okay. So I couch
6 that. It took a few -- takes a few seconds to get
7 off the mark. That's what it is. And then --

8 77 Q. Did you -- sorry.

9 A. Go ahead.

10 78 Q. No, I'm wondering if you
11 understood they had to adapt the usual -- not sure
12 if I'm --

13 A. Okay.

14 79 Q. -- saying this correctly, but the
15 speed profile, perhaps, to avoid coasting and --
16 and -- and do the rapid acceleration and braking to
17 meet the journey times. Do you have any knowledge
18 as to what I'm referencing?

19 A. Yeah, I -- I know what you're
20 referencing; I'm not quite sure what the question
21 is you're asking.

22 80 Q. Was this -- do you have any
23 awareness of Thales having to change their typical
24 standard speed profile to -- to accommodate the --
25 the requirements under the contract?

1 A. The -- yeah, so a little bit of
2 context. The train control system on -- is a unit
3 onboard; it provides -- it provides a speed
4 command, right? So it's the driver. It's the
5 driver in your car. If you get into your car and
6 you drop the -- if you drop the gas pedal all the
7 way down, the car is doing the limit of what the
8 car is doing, right? But you don't drive your car
9 like that all the time. You kind of -- so there's
10 a close -- there's a loop -- a feedback there where
11 it will power down until it's going -- until it's
12 going the right speed, and then it backs off,
13 right? And that's the -- the Thales train control
14 side.

15 There -- there -- the purpose of
16 that -- or the way they design that is to try to
17 get up to the speed as efficiently as you can, stay
18 there until you're told to slow down, and then stop
19 at the station, right? Just simple stuff. Get up
20 there, get back down, and get there in a
21 reasonable -- you know, as quickly as you can.
22 Now, as quickly as you can is kind of where it
23 gets -- it gets tricky, because the -- you can't
24 override -- you have to be -- the -- the part of
25 the troubleshooting is you have to be cognizant of

1 the way that the vehicle is set up to respond.

2 So when the train -- what the command
3 says, yeah, go, a whole bunch of stuff has to
4 happen in the vehicle, and the train control can't
5 issue a command that might damage something,
6 overdrive, underdrive, or cause a wheel the slip.
7 So it becomes a bit of a challenging integration
8 and control program.

9 So, again, I have some experience with
10 that. I've been overseeing that on the program.
11 But they're kind of slave to what the vehicle can
12 do.

13 81 Q. Right. So did you observe any of
14 that here where there were issues with slips, with
15 the wheels slipping?

16 A. It took them a long -- it took
17 them a while to troubleshoot it, particularly
18 because the -- in 2017, we only -- they -- Alstom
19 was only able to provide a short -- small number of
20 vehicles that were reliable, right? So when the
21 first vehicle was running and the second vehicles
22 were coming online, they were troubleshooting the
23 vehicle, the vehicles -- and they were changing --
24 Alstom was revising the software on the traction
25 motors, right, because they were still trying to

1 get this new vehicle working on this new rail and
2 new system and factory and everything else. So
3 Alstom was still kind of moving -- was still
4 revising the vehicle while the train control is
5 trying to revise the control of the vehicle.

6 So we saw a lot -- saw some of this
7 through -- and they ended up resolving this
8 eventually, but we did see this through the summer
9 of 2017, 2018. As the vehicles were coming online,
10 the vehicle was also being improved, I guess. They
11 were finding things on the traction motors to --
12 to -- to change their behaviour for that, and then
13 the speed control had to change in response to it.

14 82 Q. Are you aware of, later, wheel
15 flats occurring on the trains after they were in
16 service, were in operation?

17 A. Yes.

18 83 Q. And do you know whether this issue
19 might have contributed to the wheel flats?

20 A. No, I don't believe it did,
21 because what I was looking at was -- is the vehicle
22 being commanded to brake, you know, hard -- hard --
23 get up to speed, stay up to speed, and brake hard
24 enough, right? And that -- so you can get Point A
25 to Point B in the most efficient amount of time --

1 the least amount of time available, right?

2 The wheel flats were occurring, because
3 they don't -- when the vehicle's breaking normally,
4 you don't get a wheel flat, right? It's like, the
5 anti-lock braking system in your car. Da, da, da,
6 da, da. And if it locks, it will release it,
7 right? So that's under normal operation, right,
8 when you're driving your car to a stop light.

9 If you're driving -- driving down the
10 401 and you pull your handbrake on your car, you
11 get wheel flats, right? And all kinds of bad
12 things damage.

13 So that's what was happening when the
14 vehicle would have a fault and it would go into
15 emergency brake mode. So there's a -- a -- a
16 significant fault on the vehicle from the traction
17 power, the brake, or the -- any of the protection
18 circuits. So it would detect if a door was
19 opened -- maybe correctly, maybe incorrectly, but
20 there would be a response. Then the vehicle would
21 go into an emergency braking state and would just
22 slam on -- very rigid hard brakes, and then that
23 would -- that would drag the -- drag the wheels
24 across the rail.

25 84 Q. And what was your understanding of

1 what caused these faults?

2 A. Any number of failures on the
3 vehicle or on the train control detection systems.
4 So we would see -- so when I say the -- like,
5 the -- if the train control halted, it would drop
6 the brakes. If the train control detected the door
7 was open, it would drop the brakes. If the train
8 control checked that the train was going faster
9 than it should, it would drop the brakes. If the
10 train was going to over the track switch and then
11 the track switch would report that it was no longer
12 secured, it would drop the brakes. If they -- but
13 the other one was if the guideway intrusion device
14 system didn't go off. So if they -- if the vehicle
15 was coming, it was going to the station, and a bag
16 would blow through a guideway intrusion device, it
17 would tell all vehicles in the area to immediately
18 drop the hard brakes and -- which -- which on --
19 which, depending on if the vehicle was moving fast,
20 would cause damage to the wheels.

21 85 Q. Is it fundamentally an integration
22 issue between the two systems?

23 A. No. I'm -- not necessarily. It's
24 a -- it's a -- the -- a little bit of context on
25 this. The -- the rail control operation is what

1 they call a vital control system, right? Vital
2 control systems means it's safety related, and part
3 of that is -- is if -- is the philosophy of if
4 anything is at the system -- system runs and then
5 there's another system over it to see if it's
6 running okay, and that's called the automatic train
7 protection. And then if the train protection
8 system detects anything wrong with what it's
9 watching or with itself, it goes into a severe safe
10 mode, fail safe, right?

11 So if the train loses position, like,
12 the train -- so if the train positioning system
13 said -- goes along and says I know where I am, I
14 know where I am, I know where I am, whoops, I'm
15 lost, it would -- it would immediately drop the
16 brakes. It would say whoops, I'm lost. I don't
17 know where I am; I cannot safely proceed. I can
18 proceed, I can drive to Kanata, but if you can't
19 safely proceed, you don't know where you are, drop
20 the brakes now. Stop everything. You know, go,
21 you know -- and then go and get a maintainer to
22 come and find out what happened.

23 So the -- when I talk about wheel
24 damage, if any -- any one small piece goes, you
25 know, buggy or if the detection system itself is

1 buggy, it will drop severe response.

2 86 Q. And so is that all --

3 A. And that's normal.

4 87 Q. But is that all a Thales system?

5 A. Yes. Thales and -- well, Thales
6 and -- and there may be other systems onboard the
7 vehicle that would do that. But mostly that's what
8 the Thales system is -- is designed to do.

9 88 Q. The A --

10 A. That's the -- that's the safety
11 function.

12 89 Q. The ATP system is Thales's?

13 A. Yeah. Yeah.

14 90 Q. But any understanding of why
15 there's -- and tell me if I'm wrong, but would
16 there more faults on this train. Like, why would
17 there ultimately have been these faults that led to
18 wheel flats?

19 A. The vehicle could have had a --
20 there could be -- if there's a failure on the
21 vehicle of -- and, again, I'm kind of going -- I
22 don't know, but if the -- if the -- if there's a
23 failure on the vehicle such that it can't
24 accurately count the rotations of the wheel, that
25 would be a failure of a critical system, and the

1 onboard would drop the brakes and say, wait, it's
2 not safe to proceed. If a door -- if a door lock
3 was reported to be open, it would do that. If
4 the -- and there's probably other -- other
5 functions where if the brakes -- if the integrity
6 of the brakes are in question -- not if they
7 actually failed but if the sensor watching them
8 is -- you know, then they would report back, you
9 know, critical fault and -- and drop the brakes as
10 well.

11 So there's an emergency brake circuit
12 that runs typically through the -- through the
13 vehicle, and that if anything breaks, it would go
14 to severe shutdown.

15 So -- but, yeah, so it's a -- there's
16 software functions, hardware -- hardware checks on
17 the vehicle, hardware checks on the onboard
18 controller, software checks on the onboard
19 controller, and software checks on the wayside that
20 would all -- and that any one of those things
21 can -- will -- will result in an application of the
22 emergency brakes.

23 91 Q. And you don't know the specifics
24 of what in this case led -- occurred in terms of
25 what the exact faults were? Is that --

1 A. Well, it was a kind of multitude
2 of things a multitude of times. The things were
3 still being troubleshooted and developed and
4 tested. The onboard controller was still being
5 tested and -- and -- and updated. The guideway
6 intrusion system was still being installed on the
7 wayside. Switches were still -- you know, need to
8 be monitored. A failure of a switch would --
9 would -- would result in EB depending on where the
10 train was. Fire systems was cause an EB on the
11 train system. The traction system onboard the
12 train. Any one of these things, right?

13 92 Q. My question is in respect of
14 service operations, so after RSA --

15 A. M-hm.

16 93 Q. -- if this issue arose, do you
17 have any knowledge of what, at that point in time,
18 was the occasion in the emergency brake?

19 A. Not the specifics. The emergency
20 brake is not a fault; it's a result of a detection
21 of a fault.

22 94 Q. Right.

23 A. Right? And I'm careful of my
24 words, because the detection might be -- might be
25 the part is wrong.

1 95 Q. Sure. Sure.

2 A. Or might be a fault. But any --
3 any -- any -- part of the safety principle is if
4 any of the critical systems say something could be
5 wrong, stop.

6 96 Q. Right.

7 A. Yeah.

8 97 Q. But I'm saying why were things
9 happening that were going wrong? Why the faults --

10 A. Many reasons.

11 98 Q. -- post -- post RSA?

12 A. Many, many, many reasons.

13 99 Q. Okay. And fundamentally in terms
14 of root cause and why -- why many of these were
15 occurring after service operations, would you say
16 it was a lack of sufficient troubleshooting ahead
17 of going into operations, insufficient running of
18 the trainings? Do you have a view as to that?

19 A. Multitude of reasons. The -- the
20 onboard controller at the time of -- of running
21 into revenue service, the Thales onboard controller
22 was running really quite well. The -- the
23 stability of it, it wasn't prone to any erroneous,
24 you know, halting. Like, it wouldn't -- it
25 wouldn't spontaneously go, you know, whoops.

1 Internal software error. Halt. It was running
2 good. Right?

3 The -- I don't have insight as to what
4 was going on in vehicle in terms of if it was
5 having internal failures. I know that the internal
6 vehicle would have -- I'm kind of -- maybe I'm
7 speculating a bit on this but would have --

8 MS. RUSSELL: I don't want any
9 speculation. If you're able to --

10 THE WITNESS: Yeah.

11 MS. RUSSELL: If you're able to --

12 THE WITNESS: I'm not going to comment
13 on the vehicle side.

14 But there might be faults on the
15 vehicle that would cause that glitch, and that
16 would be something that all the vehicle
17 investigations would have identified later on.

18 The other items are wayside, so switch
19 machines and guideline intrusion devices.

20 And any -- of course any actual humans,
21 you know, running on the track, pushing buttons,
22 opening doors, doing things that legitimately need
23 the train to stop. And when they stop, it would --
24 it would drop -- it would drop emergency brakes,
25 and that would call wheel -- wheel slip, and that

1 would glitch a bit.

2 BY MS. MAINVILLE:

3 100 Q. Okay. Can we talk about overall
4 systems integration.

5 A. Yeah.

6 101 Q. So when you arrived, did you --
7 what -- what did you observe in terms of planning
8 in that regard?

9 A. In terms of integration?

10 102 Q. Yes.

11 A. The -- the Alcatel and Thales
12 teams were working on the -- on the speed, on
13 the -- on the vehicle interface. They mobilise the
14 team on site to, you know, complete the on-site
15 tasks about getting the controller to work with
16 the -- with the -- with the vehicle and -- and
17 troubleshoot that, right? Because the vehicle
18 contains things like sensors, and the train control
19 system would need to know if it's reading the
20 sensors properly. But the sensors are provided by
21 Alstom, right? So that would be a -- how do we
22 tune those?

23 So they were working well on that.

24 They mobilised a very strong on-site team in
25 support of that. So they -- and I went along for

1 for some of their -- some of their testing.

2 The -- and the process for that was
3 pretty formal on both sides where they would do
4 software checks on the vehicle, software checks on
5 the train control, put them out, and then be very,
6 very careful driving it, make sure they're working
7 right and sort of gradually move up. So that
8 was -- that was ongoing on site, because that was
9 where the vehicle -- that's where those few --
10 those two systems were actually in -- in -- in
11 place and actually had a track to run on. So that
12 was going.

13 And that at that point is knowingly
14 informal, right? It was try this, do this, because
15 it's engineering level. And then they moved up to
16 the formal -- to the formal level as part of the
17 commissions when the trains were rolling out. So
18 that aspect was -- was, you know, going as -- as
19 expected.

20 103 Q. Okay. Other aspects?

21 A. The other aspects were they were
22 working to install, test, and -- and tune the
23 systems in the field while the systems -- while
24 some of the functions were still being made in the
25 back office and while the track was still being

1 built. So they couldn't -- so while -- while
2 you -- in the schedule, you planned to have, you
3 know, four vehicles fully -- fully reliable running
4 when you're ready to go and all the functions are
5 done, they were working with partial vehicles,
6 partial guideway, and partial functions. And,
7 again, this happens all the time.

8 The -- I'm working two other programs
9 that are kind of going the same way, and that's --
10 you know, the question is do you schedule it in?
11 And then if the vehicle is -- is delayed or the
12 track is delayed, then your testing is delayed, and
13 the testing always get pushed to the end.

14 And then if there's anything that you
15 find during the testing, your -- your amount of
16 time to redesign and fix are sort of squished. So
17 that's kind of a broad sense of it.

18 Specifically on this job, we had -- if
19 we're running vehicles and rolling out updates to
20 the train control and -- in response to it, we
21 didn't have visibility as to the vehicle faults or
22 into what changes were being done on -- on the
23 systems at a detail level, right?

24 We -- we kind of found out the day
25 after they change -- they would update the

1 software. We would find out afterwards from the
2 City, right? So they would roll -- they roll --
3 they roll a change out, deployed system wide, and
4 we would hear about it sort of over the cubicle
5 wall. We wouldn't even hear about it formally,
6 right, in terms of the City oversight.

7 So it's entirely within RTG's and
8 OLRTC's responsibility to, you know, do the
9 integration, manage the details, and deliver it at
10 the end as the City providing, you know -- having
11 insight into the, you know, week-to-week progress
12 or the week-to-week, you know, functional changes,
13 we were firewalled from it. So we -- we -- we
14 didn't get notification of design changes in the
15 field even when the vehicles were running and OC
16 Transpo staff were onboard.

17 104 Q. Did that cause some concern?

18 A. Well, it -- it -- it -- we really
19 trusted -- even by the structure of it, you had to
20 trust that OLRTC and RTG were doing -- doing
21 everything correctly in terms of due diligence, in
22 terms of safety, in terms of completeness, because
23 we had no way of sort of looking -- we -- we had no
24 way of looking over the shoulder.

25 105 Q. Did you have any concerns coming

1 into it about what had been done on the systems
2 integration side -- on the overall systems
3 integration, whether there had been -- whether
4 there was sufficient plans of sufficient planning?

5 A. Yeah, in terms of the -- like an
6 integration -- like a stage integration plan, we
7 didn't really ever get one. So it was, you know,
8 take the -- it was -- and in terms of a software --
9 like a software update plan, like, we're going to
10 release these functions; you know, through 2017,
11 2018, we're going to change the software five
12 times, we're going to add these functions in as we
13 go, right, this kind of stuff, we never saw
14 anything, right? And I don't think one existed.

15 The project schedule and -- I think the
16 project schedule reports are part of your -- part
17 of your information -- is that OLRT/RTG would
18 deliver a schedule to the City, and that would have
19 integration as one activity right across. So we
20 start here, we end there, one bar graph. I go,
21 Whoa, whoa, whoa. Can you -- there's 10 things in
22 here. You have to do one and then -- you know, do
23 one and then the other one starts, other one
24 starts. Break this down. They're, like, no.

25 106

 Q. Did you get --

1 A. That --

2 107 Q. Sorry, repeat?

3 A. That was just part of the project
4 schedule reports that they provided to the
5 project -- the -- the -- the PMO office, the
6 project management office. Craig Killin was the
7 lead for that with Claudio. No. Yeah. Anyway,
8 that was all under Richard's group. And we
9 provided feedback on that.

10 But one of my main comments every time
11 I got the schedule was the whole testing
12 integration program is two activities: one,
13 integrate, two, test. And so I'm, like, Are you
14 20 percent along? And what does 20 percent mean?
15 And, you know, just they weren't able to give any
16 useful answers.

17 108 Q. And --

18 A. But I know that behind the scenes,
19 they would have to have much more detailed planning
20 to say, We need these people on site to do this
21 work and so on, but that never got presented --
22 that never was made available to the City.

23 109 Q. What was your understanding of the
24 level of understanding of what was required on the
25 systems integration front on the -- on the

1 contractor's side?

2 A. My view is that they
3 underestimated the role of an integrator, right?
4 So when you're taking a new train, a new guideway,
5 a new piece of rail, a new station and you're
6 putting it together, somebody needs to watch the
7 details and -- and, you know -- and make sure that
8 every change on one system gets communicated to the
9 other system. If there's an impact, you get the
10 two working together, right? And the -- and I
11 don't think that was well done, right?

12 So in terms of the -- the vehicle on
13 the train [sic] working together, you know, the
14 role of the integrator is to get these two parties
15 in the room and say, Okay, do you understand what
16 the -- what the -- you know, what level of
17 performance you need? How are you going to get it?
18 Does A understand what B needs to do and what it
19 expects? I mean, is somebody sort of managing this
20 day-to-day? And I don't think -- and that goes
21 for, you know, fire systems, power systems, SCADA
22 system, interface with -- with train controls, how
23 they talk to the user, what displays on the screen,
24 and the -- and of course how the separate systems,
25 you know, will sort of handshake.

1 And -- and will they -- and things like
2 reliability and things like travel time, every --
3 every system -- like, you have 100 seconds to get
4 from A to B, that means the vehicle can take this
5 much time, the doors can take this much time, the
6 train control can take this much time. And A plus
7 B plus D with only equal F, right?

8 Is anybody checking the budget? Like,
9 those kinds of activities just weren't done. And
10 it was -- and so it inputs to -- like, Alcatel will
11 be looking for direction from their -- who was
12 their customer, the light rail constructors, and I
13 don't think they got a lot of information they
14 needed and support on it.

15 110 Q. Sorry, who is Alcatel?

16 A. Sorry, Thales.

17 111 Q. Okay.

18 A. Yeah. But in terms of the
19 integration, right? So you buy the vehicle, you
20 buy vehicle power, rail. You know, do these parts
21 work together was something that was an
22 afterthought. They -- they bought them, and they
23 left them to the -- to the -- to the -- to the
24 individual subcontractors to get the -- the pieces
25 talking.

1 112 Q. Did you understand that anyone was
2 actually performing that role as systems
3 integrator?

4 A. They had one person working on it
5 part time, which I think was underestimating.

6 113 Q. Who did you understand that to be?

7 A. That was Jacques -- I think
8 Jacques Bergeron had the title.

9 114 Q. Okay. And then fair to say he was
10 more focussed on the vehicles?

11 A. I -- no, I -- I don't think I'm
12 comfortable sort of speculating on what he was
13 focussed on. I only interacted with him a little
14 bit, but he -- yeah.

15 But in terms of the -- of the interface
16 between the -- the vendors, the different
17 subsystems talking to each other and talking to
18 their customer, they were not -- not -- they were
19 not -- not -- I don't know. They were kind of
20 operating independently, right? So the different
21 subsystems would take the product, put it on the
22 field, and they're kind of left to make it work.

23 But when I asked questions of how --
24 like, when I asked questions how do these three
25 systems work together to do something, they all

1 kind of looked at each other going, you know --
2 that -- that wasn't their job to answer me, because
3 they were just delivering their piece. But how all
4 three pieces worked together seemed to be an area
5 that was not addressed.

6 115 Q. And --

7 A. Very well, I should say.

8 116 Q. Right. And what implications can
9 that have on performance reliability, ultimately?

10 MS. RUSSELL: Sorry, counsel, I want to
11 interrupt there for a moment, because I do think
12 that question is asking my client to speculate or
13 give an opinion. So maybe you want to reframe that
14 question, please?

15 BY MS. MAINVILLE:

16 117 Q. Right. Do you believe this -- in
17 this project, this may have had an impact on the
18 reliability of the system or the performance
19 ultimately?

20 A. Yeah, I -- I would say there would
21 be an impact maybe not on reliability but on
22 performance.

23 118 Q. But how do you distinguish those
24 two things?

25 A. Reliability is if something fails

1 and has an impact on the overall system.

2 119 Q. Okay.

3 A. But there -- maybe. The -- to a
4 degree as well. Like, if a failure -- if you have
5 some -- you know, you can have some failures that
6 are -- you know, will impact the service and others
7 that don't, right? So if you have, like, a back-up
8 system, two pantographs on the train, one system
9 goes and the other goes, so you have redundant
10 systems.

11 And troubleshooting. If one system
12 fails, you say, oh, that thing needs to be fixed,
13 and you run out and do it. That's how service
14 maintenance runs, right? So system maintenance
15 runs every day, gets beat up badly, things break,
16 and they fix them as they go, right? That's what
17 they call system availability, which is, you know,
18 allowing things to break and then -- but the whole
19 thing keeps running.

20 And then how those things work together
21 is -- it's always a challenge, though, because
22 the -- it gets into when a failure occurs, how do
23 they identify it and how do they respond to it?
24 That comes out -- if you see some of the later --
25 later service -- service faults, there's a response

1 to failure that was -- that was -- it was an item
2 (indiscernible).

3 So that did -- that did start impacting
4 the reliability of -- there's things like when
5 certain failures would occur, were you ready for
6 them? And that question wasn't -- wasn't well
7 done, I think, on the -- on the job, right?

8 It was the test -- testing -- testing
9 procedures, the ones we've seen, were focussed on
10 installation, right? Is the box installed
11 properly? That was one level of tests. And the
12 next level of test we saw were did you meet the
13 project agreement? Right? So is the box there and
14 did you meet 23 minutes?

15 There's a whole lot going on in the
16 middle, right, in terms of failure modes and
17 system -- system safety and safety responses and
18 user interfaces, and we didn't see a lot of that.

19 And when we did see it, it was kind of
20 reluctant, like the -- the -- the SCM -- the
21 requirement traceability when I looked at --
22 started getting involved in 2017, we were looking
23 for requirement traceability and testing to
24 requirements, and they weren't able to produce
25 anything.

1 And then they brought in some
2 afterwards to try to -- try to, you know, connect
3 the -- the safety case and the reliability case
4 after the -- after stuff was already being
5 delivered to the field.

6 120 Q. Okay. Can you explain that to me
7 a bit more, the --

8 A. Well, things -- like, part of the
9 integration process is what they called
10 requirements management, right? So, okay, the main
11 system needs to do this, the different parts need
12 to do this, this, and this. The -- and then make
13 sure every sub -- sub vendor, you know, delivers
14 that part, and the whole thing works together.

15 And you also have a link between the
16 final testing and the -- the -- the -- and what you
17 promise to deliver.

18 And so this is role of the integrator
19 to say, Everything that I've promised to deliver to
20 the -- you know, the -- for the entire transit
21 system, every piece is doing what it needs to do
22 together in support of that.

23 And because there's 1,000 moving parts
24 and 1,000 -- and 100 different sub vendors, you
25 have to have a formal -- you know, track it as you

1 go. And this seemed to be an afterthought when I
2 got involved in 2017, saying, Do you have, you
3 know, traceability of how all these things worked
4 together and how all the requirements are met and
5 that matted out, they weren't able to provide much
6 confidence in that.

7 121 Q. Was this part of the integration
8 testing? Or is this aside from --

9 A. Well, it's a part of quality
10 assurance and integration -- what we call
11 integration management. So do all the sub
12 systems -- you know, when there's a failure of one
13 sub system, you know, is it -- are things notified
14 all the way through? When there ends up a hazard,
15 then -- then, you know, anything that can go wrong,
16 have you looked at it from a safety point -- point
17 of view? Do all the, you know, alarms that one
18 system generates get reported to the others? And
19 you can have a system that says, well, alarms are
20 being sent through, but do you have them all? And
21 what do you call all? So these inputs to the
22 designers is always kind of -- and it's always a
23 challenge in every program to do that. That was
24 part of my -- my prior role was to try to -- try
25 to, you know, keep that stuff together.

1 But it's things like coordinating
2 between the -- the -- the train control, the train
3 power, and the power control and make sure that
4 every sub system knew what it -- every -- every
5 provider knew what they had to do before they got
6 there.

7 And I saw a lot of them were coming up
8 there with what they had available and were
9 figuring it out on site, and so there's a lot of
10 rework and -- rework and rejigging going on.

11 122 Q. Lack of planning is what you're
12 saying?

13 A. Lack of integration, yeah. So the
14 systems were -- things like the -- like the
15 traction power system, right? They said, Okay, we
16 have a pantograph, we have a role. Go and deliver
17 the rail. And they say, How tight does this need
18 to be? I don't know. How quick does the train
19 need to be off the mark? They had no parameters to
20 work from. How fast do the train doors need to
21 open? No parameters, right?

22 So anything that -- yeah, so they
23 basically delivered what they -- basically
24 delivered something, but did it all work together
25 to deliver the performance was -- nobody was kind

1 of keeping an eye on that.

2 123 Q. And who are you -- who are your
3 counterparts here when you're interacting and
4 getting these responses?

5 A. Well, again, my -- the challenge
6 is that the questions were, you know, Show me
7 the -- show me the integration plan. And then
8 nothing. Show me your validation program plan.
9 And we had maybe six meetings where OLRT brought us
10 in and said, This is our testing plan. They put
11 the schedule up there. But we didn't have anything
12 really sort of in writing to -- to read ahead of
13 time. They did those for a few, and then they
14 stopped, because we would ask all kinds of
15 questions, and they didn't -- you know, they
16 weren't well managed.

17 And then, yeah, we just saw -- like,
18 again, my -- my -- my observation of the system was
19 anecdotal, right? So I would watch a program going
20 through and then say, you know, How -- you know,
21 how are these things working together and under
22 what -- what's your -- what requirements have you
23 been given by the integrator to perform to? And
24 nobody was able to provide sort of a clear, you
25 know, indication of what they were required to

1 perform to so in, like, a sub contract or interface
2 document or interface specs. These conversations
3 were ongoing, but we were not allowed -- we were
4 not privy to them.

5 As I mentioned, there were changes
6 being done to the vehicle and to the train control
7 in 2017, 2018, and we could find out after the
8 fact. And we --

9 124 Q. Is --

10 A. Yeah.

11 125 Q. You can keep going.

12 A. They were -- they were really
13 under no -- they were under no obligation to
14 disclose or discuss anything with the City as part
15 of the nature of the contract.

16 126 Q. Is this in the context of RAMP
17 meetings that you're getting this information or
18 making these requests?

19 MS. RUSSELL: So sorry. I don't mean
20 to interrupt. I didn't catch the word you said
21 before "meetings."

22 MS. MAINVILLE: RAMP, R-A-M-P.

23 THE WITNESS: Rail Activation
24 Management Program?
25

1 BY MS. MAINVILLE:

2 127 Q. Yeah.

3 A. I wasn't involved in those.

4 128 Q. Okay.

5 A. I know they were at a higher
6 level, director level. At the engineering level,
7 we'll call it that, Richard was able to get OLRTC's
8 team to do some weekly meetings where they would
9 discuss the validation plan, because we were -- we
10 were to witness the testing. And part of it was
11 to, you know, see the test procedures, get ready
12 for them, watch them, observe them, and witness
13 them.

14 129 Q. M-hm.

15 A. And part of that was, you know,
16 being able to see the -- get some visibility into
17 the test procedures and the schedule from a -- sort
18 of an assurance point of view, that's just, like,
19 the end formality, right? So all the
20 troubleshooting and everything should be working
21 ahead of time, and this is the kind of final stamp,
22 which in order to provide, you know, sort of an
23 oversight as to the quality side, that -- that --
24 it was -- it was still kind of high level.

25 But, so, yes, we just got -- and just

1 kind of final accept appearance, right? So it was
2 once everything was in the final state, they would
3 demonstrate it for us, sort of a dog and pony show,
4 and then that would be their -- their evidence that
5 it's ready to go.

6 So we were -- we -- we brought in for
7 a -- so we had a validation schedule or a test and
8 accepting schedule, and then we test -- test to
9 witness. But even then, the meetings lasted maybe
10 six or seven meetings, and then they got -- just
11 kind of got frustrated with them, and the meetings
12 got cancelled.

13 130 Q. When you say "they," you mean
14 OLRTC?

15 A. Yeah. Yeah. All I know is I
16 was -- again, I was the consultant in support of
17 the City. So when they invited me, I went; when
18 they cancelled, I said okay. But, yeah, they were
19 struggling with the -- the -- the validation
20 meetings in the -- meetings, because they put a
21 plan up there, and we would immediately look at
22 what's on the screen and go, Okay, well, we haven't
23 seen the procedure for this. How is this going?
24 That one -- that -- that thing you said is already
25 done we know you haven't done yet. And we'd

1 challenge them real time.

2 Overall, the engineering levels were
3 very helpful. The engineering level teams were
4 very helpful when asked direct questions. But when
5 we asked for, you know, anything that would show --
6 we asked for, like, a detailed test procedure, a
7 detailed test schedule, they were not able to
8 provide one.

9 131 Q. Okay. And so are you mostly
10 dealing with the engineers at the meetings, or were
11 there project directors and managers?

12 A. Well, I say engineers. I mean
13 Mathieu Branconnier, the manager of testing,
14 Mr. Bergeron, and from the City's side, there would
15 be many people there from OC Transpo, because they
16 were -- they were -- they were kind of operating
17 the systems throughout the testing phase, and as
18 well as construction office. So, yeah, like, the
19 managers -- the test managers --

20 132 Q. Okay.

21 A. -- from OLRTC.

22 133 Q. So you're not necessarily
23 interacting with the project managers and
24 directors?

25 A. No, not -- well, the managers -- I

1 say managers, yes, but not the directors.

2 134 Q. Okay.

3 A. So not -- I forget some other
4 names, but, yeah, not the same --

5 135 Q. Not Eugene Cramer or Matt Slade?

6 A. Matt Slade, yes.

7 136 Q. Yes.

8 A. Certainly, and Eugene was in the
9 room for some of these, yeah.

10 137 Q. Okay. And then just going back a
11 little bit, when you talked about being reluctant
12 to -- to provide, I think -- correct me if I'm
13 wrong, but to provide some of this, was it a lack
14 of -- this was when you were talking about the
15 failure modes as part of the testing and
16 conditioning. Was it a -- to the best of your
17 knowledge or observations, you know, a lack of
18 time, a lack of understanding of what was required,
19 you know? What -- what informed the --

20 A. Well, in terms of the --

21 MS. RUSSELL: Sorry, I just --

22 BY MS. MAINVILLE:

23 138 Q. I'm not asking for their
24 perspective. I just want your observations in
25 terms of --

1 MS. RUSSELL: No, and fair enough,
2 counsel. I just wanted to be clear, because I
3 think I understand what you're getting at, but you
4 talk about -- you said about them being reluctant
5 or someone. I just want to --

6 THE WITNESS: Yeah, I wouldn't use that
7 word.

8 MS. RUSSELL: -- confirm who you
9 mean -- who you mean when you talk about reluctant.
10 I didn't understand that necessarily from your
11 question.

12 BY MS. MAINVILLE:

13 139 Q. If you could clarify? Because you
14 used the term earlier, "reluctant," and that's what
15 I'm trying to clarify.

16 A. Okay. Yeah, maybe that's a poor
17 choice of word. Yeah, the -- they -- yeah, they --
18 again, we didn't have visibility into it, right?
19 We didn't have sort of commercial rights to demand
20 documents outside of what was in the contract. So
21 the -- the -- to that point, though, we also
22 weren't able to scrutinize or provide, you know,
23 commentary or troubleshoot or highlight any issues
24 around integration or failure mode management,
25 right? So if -- you know, if one system raises an

1 alarm and sends it to the other system, did they
2 action it? When I say alarm, basically fault
3 reporting across all the systems. And was that
4 being, you know, stuck together well?

5 And that was probably the most evident,
6 because the alarm reporting system was provided
7 by -- by the -- the -- what the -- what the
8 controller saw on the screen was the -- Alcatel,
9 you know, displays and the SCADA displays, but
10 they're getting inputs from a bunch of other sub
11 systems, right? The fire, the stations, the power.

12 And so they were, you know, always --
13 this question of should this be a report? Should
14 this be alarm or should this not be, nobody was
15 kind of putting that together. So when a sub
16 system raised a -- they raised -- went beep, the
17 message went through, and what do you do with it?
18 I don't know. And that -- that -- so that was one
19 sort of very visible point of where the integration
20 of the systems was not managed. Because we raised
21 a couple of points, Somebody needs to look at this
22 and they go, Okay, when this system send this line
23 over here, what should we do with it? And that
24 kind of just -- that went no, right? Or they
25 just -- like, it just dragged and dragged and

1 dragged. Because the different sub system vendors,
2 again, they delivered their thing and they
3 commissioned it, installed it, said, Yeah, we're
4 good, and then, you know, nobody -- nobody told
5 them up front how it should work in terms of
6 corresponding with other systems. And then if they
7 got -- made any changes afterwards, then that's a
8 change, and that might delay things, so...

9 140 Q. And --

10 A. But yeah.

11 141 Q. -- I just want to be clear, every
12 time you say Alcatel, you mean Thales?

13 A. Thales, sorry.

14 142 Q. Because they changed names?

15 A. They changed names. I worked -- I
16 worked for 10 years -- 10 years for -- I worked for
17 nine years for Alcatel and one year for Thales.
18 That's on me. Sorry.

19 143 Q. That's okay.

20 A. But to that point, the Thales team
21 was doing everything right given what they were
22 instructed to do from their customer anyway.
23 That's my -- that's my sort of assessment on it.

24 144 Q. Do you know why SEMP was brought
25 in?

1 A. The SEMP consultants. I wasn't
2 part of that advice. That occurred just about when
3 I first started with the program.

4 145 Q. Do you know what they brought to
5 the table?

6 A. I would be speculating a little
7 bit to answer that.

8 146 Q. That's fine. What did they bring
9 to the table?

10 A. Fundamentally, the safety case, I
11 think, because they were asked to clean it up, as
12 the multiple different vendors had, you know,
13 hazards that, you know, existed and potentially
14 operates through multiple systems and there was --
15 and they needed to get things in order to manage
16 that better. And the -- you know, every -- every
17 vendor doing their own thing leaves a lot of
18 opportunity for stuff to fall in between, So that's
19 why it's important to have them -- have a -- an
20 integrated safety hazard mitigation strategy as
21 well as requirements, you know, through the
22 different systems and through the different
23 companies that are providing those systems. And so
24 somebody needed to put that together.

25 And I think SEMP had to come in,

1 because it wasn't done during the -- it wasn't
2 done -- it wasn't well managed during the design
3 phase. They were brought in late, and so they had
4 to generate documentation, you know, on systems
5 that were already in the mail.

6 147 Q. And what --

7 MS. RUSSELL: Sorry, I don't want to --

8 THE WITNESS: I'm kind of speculating a
9 little bit on that.

10 MS. RUSSELL: Yeah. Please --

11 THE WITNESS: I know.

12 MS. RUSSELL: -- I don't want you to
13 speculate or to guess in respect of any of your
14 answers.

15 THE WITNESS: All right.

16 MS. RUSSELL: Sorry, counsel, I didn't
17 mean to interrupt. I just have my eye on the time,
18 and I just realise we have been going for about an
19 hour and a half now. I was just wanted to check in
20 to see if Mr. McCurdy might require a break or --

21 MS. MAINVILLE: We'll take a break
22 regardless. Let's go off the record.

23 (ADJOURNMENT)

24 BY MS. MAINVILLE:

25 148 Q. Testing, can we talk about testing

1 and conditioning and what the plans were when you
2 come in?

3 A. Okay. So I'm just pulling up
4 some -- some notes and items here, because there is
5 a Testing Commissioning Working Group.

6 149 Q. Were you part of -- were you part
7 of that?

8 A. Yes, I was.

9 150 Q. Okay. And --

10 A. There was a series of meetings --

11 151 Q. Sorry. I just want to clarify.
12 Was that a City working group?

13 A. Hosted by OLRT constructors.
14 They -- a -- a large audience, including
15 Frank Fitzgerald, Jacques Bergeron,
16 Mathieu Branconnier, John Selke, Jonathan Hulse,
17 and myself, so almost too many people. But it was
18 basically a schedule review of the Testing
19 Commission activities and around 2018, so end of --
20 end of 2017, early 2018. So I'm just pulling up
21 some notes here. They have testing on there, and
22 it was to -- I imagine these were part of the
23 document trove.

24 152 Q. These are notes you took at the
25 time?

1 A. No, these are the official minutes
2 by the OLRT --

3 153 Q. Okay.

4 A. -- constructor's group.

5 154 Q. And do I take it that, being part
6 of the group, you -- you -- you had the -- you had
7 access to the information you needed for testing
8 and conditioning?

9 A. I had access to the integration
10 that was made available, which was largely this
11 meeting.

12 155 Q. Okay. So tell me about that.

13 A. So, yeah. So they delivered
14 verbal reports on the status. So they would
15 deliver an issue -- in the minute -- in the -- in
16 the meeting, they would put up a testing schedule.
17 And then they would check it off, saying, Yeah,
18 this is what -- this is what we've done, this is
19 what's outstanding.

20 But it would be largely high level, so
21 it would be sort of a checklist of what they have
22 accomplished, what their updates are, and what
23 tests have been completed.

24 So they would say -- like, for example,
25 one note here, it said CBTC -- which is the train

1 control -- Zone 3, Maturity 0, test completed.
2 Right? So I was, like, Okay, so what is Zone 3,
3 Maturity 0? And then they go well, Oh, well, you
4 have to go -- and so we'd get sort of a rough
5 schedule saying, Okay, well, it's these tests. I
6 go, Okay, can you give me the content of those
7 tests? And they go, you know, No, no, this is kind
8 of -- this is kind of all it is. Right? So it's
9 kind of like a title. Just scheduling and updates,
10 but the details of what was tested and what it was
11 tested against and the past criteria were --

12 156 Q. So can I --

13 A. -- was -- was not challenge --
14 was -- was included in the meetings.

15 157 Q. So can I clarify? Are you
16 witnessing any of the testing, or you're just
17 receiving these updates about it?

18 A. Okay. You raise a very good
19 point. No, I'm not witnessing these tests.

20 158 Q. Okay.

21 A. Right? So they -- when I -- when
22 I sort of, you know, go out there and watch,
23 they're doing testing. And I say, Can you share
24 me -- and I -- can you show me your results? And
25 it's kind of, like, No, no, no, we are just

1 recording them on the hard drive. We're going to
2 take them away and write up the report. Which is
3 fine; that's normal.

4 But then the reports, they weren't sent
5 to the City. They were sent to -- they basically
6 stayed within their companies and still never --
7 never seen the reports from any -- from -- from a
8 lot of these testings.

9 159 Q. Didn't they need to be approved if
10 not by the City then by the independent certifier?

11 A. No. The -- the detailed level of
12 the functions -- any -- the functional tests and
13 the maturity level test, right, so is the -- is
14 the -- is the software functioning in the field?
15 Is the train tracking? Is the signal getting
16 through? Those type of things, those were never --
17 well, hang on. Both kind of yes or no. The --
18 the -- the functional tests, we have not -- we have
19 not seen the procedure. The detail -- the lower
20 level functional test, we have not seen the
21 procedures, and we have not seen the final report.

22 160 Q. Do you know --

23 A. The -- and -- and --

24 161 Q. If you could just pause sometimes,
25 because your answers are very long, and I -- I do

1 need to ask some --

2 A. Okay.

3 162 Q. -- clarifying questions.

4 A. Sure.

5 163 Q. Do you know of anyone at the City
6 who received this?

7 A. No. They haven't -- if they
8 haven't -- they were supposed to come to me when
9 they come in.

10 164 Q. Okay.

11 A. And they were supposed to be
12 delivered as part of the package for substantial
13 completion.

14 165 Q. Right. So you're basically -- you
15 were designated as the person in charge of the
16 testing and commissioning for the City?

17 A. No, I was -- I was not in
18 charge -- I was not in charge of testing and
19 commissioning for the City.

20 166 Q. So why would it come to you if
21 anybody --

22 A. Well, I was oversight for the
23 train control system. You raise a good point.
24 When you say who was in charge of testing for the
25 City, nobody really had that role. We were -- we

1 were witnessing -- the rail -- the rail
2 construction office was the witness formal
3 acceptance tests, right? And so that is the
4 highest level checklist, right? So, like, the
5 end-to-end, yeah. That -- so there was a list of
6 the higher level tests.

7 But anything sort of below that, like,
8 are these two systems working right or if a failure
9 occurs, does the alarm go through, those are -- we
10 were blind to those.

11 167 Q. So am I right to say, then, that
12 you/the City --

13 A. M-hm.

14 168 Q. -- received everything that was
15 required under the agreement in terms of --
16 required to be produced to the City in terms of the
17 formal acceptance test, you just didn't see the
18 sort of more granular testing results?

19 A. We were -- any ability to assess
20 the -- the -- the functionality of the -- and
21 the -- and the -- okay. Two -- two points. We
22 didn't -- we -- we -- in -- in many areas, we
23 didn't know what the systems were going to do until
24 we saw them, right? So for the -- the -- like, the
25 train doors, the -- the alarm messaging and things

1 like that, you go, you say what messages is played
2 at what station at what time? If you want to find
3 out, you have to go to -- you have to wait until
4 they install it and then go to the station and try
5 it. But we couldn't get a list of what it was
6 supposed to do before it went to the field and was
7 installed.

8 So the City's ability to say, yes, this
9 works, no, this doesn't, or you've totally missed
10 the requirements on this, we were not able to
11 effectively evaluate if the design sort of worked
12 for the users, the operators, the passengers,
13 because those aspects were only -- we had a very
14 high level design review material five years ago --
15 like, 2015, 2016 -- what was actually delivered in
16 the field, sometimes the -- something slightly
17 different. There was no mechanism for updating the
18 new function to the City.

19 If the vendor's provided that to OLRTC,
20 it didn't get through, because they would only
21 submit through what they were required to.
22 Everything else, you know, they just didn't,
23 because they weren't required to.

24 169

Q. And --

A. And this was an issue for me in

1 the -- trying to, you know, see -- try to see if
2 the -- the -- the images on the screens, the
3 service reliability in case one thing goes wrong,
4 can you go around it? The messages on the wayside,
5 the response to the guideway intrusion, were they
6 going to work in the field? We didn't have the
7 details as to what the systems were doing, were
8 supposed to do, or what they were doing until we
9 went out there and -- and looked at it after it was
10 installed.

11 So this is why -- and then at that
12 point, we would say, Wait a minute, there --
13 there's a deficiency here, and they go, Well, it's
14 too late, right? We're going -- if you want,
15 we're -- you know, it's already installed. And so
16 it was very frustrating in that area, and that's
17 why we continue to have a list of deficiencies and
18 concerns that would -- that would -- so after
19 substantial completion, there was a list of
20 outstanding, you know, items raised by the City
21 saying you haven't done these, we haven't seen the
22 test reports, these functions aren't there,
23 you're -- you know, you have the documents for
24 it -- for that.

25 And, yeah, and then they -- they --

1 the -- any -- ideally, an integrator, risk
2 management, oversight in the City would identify
3 these concerns early on when they could be
4 resolved, and that was our goal in doing that. I
5 think to a certain degree, it was within the
6 constructor's goal to do that as well. But a lot
7 of things got -- you know, we just didn't have
8 visibility on them until after it was already
9 built.

10 170 Q. Okay. And so as I understand it,
11 these were in relation to things the City had to
12 sign off on?

13 A. No. We didn't sign off on
14 anything.

15 171 Q. But -- but you couldn't -- in
16 terms -- and that goes to your point about having a
17 list of outstanding items at substantial
18 completion; right?

19 A. Well, sorry, can you clarify that
20 question?

21 172 Q. So I guess I'm trying to
22 distinguish between what, on paper -- not -- you
23 know, the City should have been able to sign off on
24 versus --

25 A. Okay.

1 173 Q. -- what you were actually able to.
2 I'm just trying to understand.

3 A. Okay.

4 174 Q. Like, the City was supposed to
5 sign off on these, were they not?

6 A. The -- the -- the contract only
7 had the high level acceptance procedures, right?
8 It was at the City -- because we -- we did receive
9 the top level test procedures and commented on
10 them, but the City didn't have approval over them.
11 So if we had a -- a concern, saying, you know, This
12 isn't good enough or you missed a spot, they kept
13 going and were under the rights to do so. Right?
14 They were submitted for -- for comment but not
15 approval. So we could have a comment, but they
16 were not required to do anything with our comments.

17 175 Q. So is it your understanding
18 that --

19 A. Provided they were fully compliant
20 to the project agreement, which was very high
21 level.

22 176 Q. Okay. And was it your
23 understanding that they were -- what was deficient
24 and the list of deficiencies and concerns that
25 you -- you referenced at substantial completion,

1 these were not things that could prevent the
2 substantial completion? Like, were they just
3 comments as opposed to --

4 A. Well, there -- there -- there were
5 many of them. Many of them are the -- the tests
6 weren't completed, right? The testing weren't
7 completed successfully, we don't know what it does,
8 we don't know if it does to the right requirement.
9 It just wasn't done.

10 177 Q. And --

11 A. And the -- the question of, you
12 know, is that something that they want to -- you
13 know, substantial completion under the contract
14 allows for things to be carried past it.

15 178 Q. Right.

16 A. Some things subject to mutual
17 agreement.

18 179 Q. Right. Again, that's what I was
19 getting at. These were things the City ultimately
20 agreed to defer, but think didn't have to. I'm
21 trying to --

22 A. That's -- that's something I can't
23 make a statement on. I provided my -- I provided
24 my list of concerns as part of the substantial
25 completion assessment in 2019, and they were taken.

1 And the City and the constructors then -- then --
2 then took those -- took those items along with the
3 rest of the teams, right, the architecture team,
4 the vehicle teams, and they took those forward as
5 part of the substantial completion, submitted it to
6 independent assessor, and it was out of my hands at
7 that point.

8 180 Q. And you submitted your input to
9 Richard Holder?

10 A. Yeah.

11 181 Q. Okay.

12 A. Yeah, Richard, Eric, and that --
13 that team to then put into an ultimate response to
14 the substantial completion request and -- and
15 manage that.

16 182 Q. And did -- what discussions did
17 you have with Richard Holder about this or -- or
18 Eric?

19 A. Well, part of the substantial
20 completion -- let me pull up a few notes on -- on
21 it; and, again, this should all be documents that
22 are already part of it -- is they submitted a set
23 of -- trying to find the deals here. Yeah, so they
24 submitted a set of documentation with their claim
25 that they are substantially complete. Yeah. So

1 April -- 26th of April, 2019, substantial
2 completion notice.

3 183 Q. You mean by "they," RTG?

4 A. Yeah, Rideau. Yeah. So that was
5 sent to -- so they submitted that and we -- we
6 responded -- or I -- I provided inputs into their
7 response.

8 With that, they -- they -- formal --
9 formal notice that they feel they completed all
10 contents of the contract, and then here is their
11 evidence to do so. And then we were asked to open
12 the evidence and identify it if everything was
13 there or not.

14 184 Q. Okay. So you had input into
15 whether substantial completion was met and the
16 various items there?

17 A. Yeah. So I -- I identified a
18 number of -- of items of concern, provided them to
19 our -- Richard and Eric's teams to -- to -- and
20 compile.

21 185 Q. And --

22 A. And --

23 186 Q. -- just so I'm clear, because
24 Rideau Transit Group applied twice for substantial
25 completion, and I don't have the dates in front of

1 me, are you referring to the first time or the
2 second?

3 A. First time.

4 187 Q. And, in fact, at that time,
5 substantial completion was not achieved?

6 A. Correct.

7 188 Q. Okay. If we move to the second
8 date, did you provide the same input at that time?

9 A. No, I did not. I was -- I was not
10 requested to.

11 189 Q. Okay. And when -- I don't think
12 we -- I asked you, when did your involvement on the
13 Ottawa LRT project end?

14 A. The project concluded when they
15 went into revenue. So I continued to provide
16 supervision on the program through to September,
17 October 2019, but I also continued -- I continued
18 on, and they -- an ongoing basis, you know, offsite
19 providing -- to assist Richard with the resolution
20 of the outstanding deficiencies as they pertained
21 to the train control.

22 And also I've been working to support
23 the system for scheduling, so for train schedules,
24 and also provide oversight on post revenue design
25 changes and updates.

1 190 Q. Okay. And -- and until when? Are
2 you still involved at all?

3 A. I'm still -- I'm still involved
4 with it, yeah.

5 191 Q. Okay. Got it.

6 A. I think we've concluded that --
7 yeah, so I'm still involved once a month to support
8 Richard in -- in trying to conclude technical
9 deficiencies from the Stage 1. It's minor -- you
10 probably -- you're aware of the -- what they --
11 what they refer to as the deficiencies list.

12 192 Q. The minor deficiencies list?

13 A. Yeah.

14 193 Q. Are some of those deficiencies you
15 would not consider to be minor?

16 A. I'm -- the minor/major is more of
17 a commercial definition that I don't wish to
18 comment on. I do see them as deficiencies, but I'm
19 just focusing my attention on the train control
20 aspects, usability, some functions that were
21 deferred.

22 194 Q. It is a pretty extensive list;
23 correct?

24 A. M-hm. Yeah.

25 195 Q. And --

1 A. I'm only tracking a small set of
2 them.

3 196 Q. Right. Okay. And is that the
4 case for your earlier input on substantial
5 completion? Is that focussed on train control or
6 was that more --

7 A. Yeah, I was focussed on the train
8 control.

9 197 Q. Okay.

10 A. There -- there was a -- there was
11 a large team there working on tunnel vent, power,
12 vehicles, and so I was provided the train control
13 on --

14 198 Q. So even your involvement on
15 testing and commissioning was focused not on
16 overall testing and commissioning but on train
17 control?

18 A. Yeah, on the train controls and,
19 by extension, things that the controls touched,
20 right? So headway, throughput, travel times.

21 199 Q. Okay. Are there any -- well,
22 first of all, you were -- you say you were not
23 asked for substantial completion for input. Do you
24 know if anyone else --

25 A. On the second one.

1 200 Q. Yes. Sorry. Do you know if
2 anybody else was?

3 A. I don't know.

4 201 Q. Okay. And you --

5 A. They -- they could have taken my
6 input from the first and done, but I also -- I also
7 didn't receive an updated package. They gave a
8 package of their test -- of their test -- of their
9 evidence of completion, test report, I guess,
10 validation evidence, and I've not seen an updated
11 validation evidence. So whatever I saw in April
12 was the last test valid -- was the last test report
13 that I've seen.

14 202 Q. April 2019?

15 A. Yes.

16 203 Q. So did you not provide later input
17 into the minor deficiencies list?

18 A. Yes, I did.

19 204 Q. So what was that based on? Like,
20 what --

21 A. We're -- well, one of them was a
22 lot of the tests were still not -- I have no
23 evidence that the tests were done, and I have no
24 evidence what these tests are. And so, yeah. And
25 so they're saying everything's, you know -- all the

1 testing is completed, and the City doesn't know
2 what the test -- what the -- you know, we only know
3 the top level test procedures, but we don't know
4 the detail -- we don't know the sub system test --

5 205 Q. What --

6 A. -- what they were, were they done,
7 or were they done successfully?

8 206 Q. What would you consider the most
9 significant tests that you're not sure were -- were
10 performed or that you have no evidence of -- of
11 being performed or of the results?

12 A. Well, the most significant one is
13 the -- is the -- the current performance of, like,
14 the speed control and the current performance of
15 the failure management. We are left to -- we
16 are -- we are trusting that the integrators and the
17 sub vendors have done everything diligently in
18 terms of -- of safety and fault management. And,
19 you know, having worked with them, I don't have any
20 doubt to that, because they're very, very careful.

21 But in terms of the -- you know, the --
22 the -- the fault reporting and the speed control
23 resolution and the travel times and, you know,
24 those items, they were still kind of being
25 modified, and we never saw evidence of a final

1 conclusion.

2 So from my -- I'm looking at it more
3 not did the test fail but did they have clear pass
4 criteria, right? And what did the system do when
5 you do this, this, and this? And we kind of don't
6 know.

7 And I'm looking at obscure scenarios,
8 right? We know normal scenarios: You know, leave,
9 go to the next station. That's fine. We watch --
10 we witness it every day. But it's the -- the --
11 what we don't do -- what we don't use it for every
12 day. We don't know what it does until we try it --
13 we try it out. So we ask operators in the field
14 to, you know, send a command and see what it does,
15 because we don't know what -- you know, under
16 what -- there's conditions of the details that we
17 don't have visibility into from the design -- from
18 the test -- from any test report.

19 So we should see the -- the vendor,
20 the -- the integrator should, you know, check the
21 system out, put it into a -- a test result and get
22 the test result to the quality checks. And
23 somewhere in that pipe, we as the City, we're --
24 we're -- still have not seen the test -- like, the
25 full set of test results, so we can't scrutinize

1 them.

2 207 Q. And what discussions did you have
3 with Richard Holder or Eric Dubé about that or
4 others in the City?

5 A. They know.

6 208 Q. What was the response?

7 A. I just provided my observations.
8 It's not -- it's not for me. They don't owe me a
9 response.

10 209 Q. No, but did they respond? Did
11 they say they would follow up? Did they say they
12 were not concerned? Did they -- like, was there a
13 response?

14 A. They wouldn't respond to me. I --
15 I didn't ask them to. I said, look -- in my -- in
16 my summary submissions there, I said, Look, we
17 haven't seen the final test results for -- for the
18 detailed stuff. We have test results for the
19 completion. That was submitted as part of the
20 process for substantial -- claim of substantial
21 completion and the notice of readiness for revenue
22 service under the P3 contract.

23 And I wasn't -- I wasn't part of the
24 decision to, you know, evaluate those when they
25 came through.

1 210 Q. Are there any items on the minor
2 deficiencies list that could have impacted
3 performance reliability or safety of the vehicle?

4 A. Not safety. They were very --
5 they were very cautious on the -- ensuring that
6 safety hazards were -- were resolved --

7 211 Q. M-hm.

8 A. -- on there, and that -- that
9 continues to be an ongoing thing. I think in terms
10 of reliability and fault management, I've raised a
11 couple items of concern where the vehicle would
12 have to default back to manual condition, and then
13 the operators would take it from there. But we had
14 those workarounds operating in place.

15 But as an ongoing level, we want to get
16 those systems, you know, not relying on manual
17 override so much.

18 212 Q. Okay.

19 A. So they're -- they're safe -- safe
20 to run with currently, but we'd like to see them
21 resolved before we close out the final program.

22 213 Q. And did you convey to the City --
23 well, let me first ask you this.

24 A. Okay.

25 214 Q. What input did you have about

1 this -- this fault management issue being on the
2 minor deficiencies list?

3 A. Yeah, just to provide regular --
4 regular update. I think after revenue, we -- we
5 met with the OLRT constructors on a monthly basis
6 to -- to review them to -- to sort of try to
7 explain why we raised those comments and where the
8 issues were so they understood them and then asked
9 for action for our -- prior to -- prior to
10 resolving. And we still have those meetings down
11 once a month.

12 215 Q. What I mean is did you have
13 concerns about that item not being resolved prior
14 to revenue service availability?

15 A. The items that are currently on
16 there are -- are mainly related to scheduling. So
17 they -- the trains are running. They're not
18 running as well -- as sufficiently as they should
19 turned contract, but they are running. And so we
20 continue to try to get action to improve those --
21 improve the accuracy of the scheduling.

22 216 Q. So you mean the -- the journey
23 times being met and such things, the performance?

24 A. Yeah.

25 217 Q. Okay.

1 A. Yeah.

2 218 Q. What about vehicle availability?

3 A. That's not an area that I provide
4 input on.

5 219 Q. Okay.

6 A. Right? So when you look at the
7 vehicle -- vehicle faults or vehicle going into a
8 shutdown mode, that's not -- there's a team working
9 on that, and I'm not part of that. I'm -- my focus
10 is on the control and operations.

11 220 Q. Okay. And did you -- did you
12 convey concerns about any items on the minor
13 deficiencies list being on the list and not being
14 resolved prior to revenue service availability from
15 a -- particularly from a reliability standpoint,
16 right, that could impact the performance of the
17 trains or the reliability of the train?

18 A. None would rely -- none would
19 impact the reliability. None would cause a failure
20 or -- or change the response to a failure on there.
21 It's more in terms of travel time, headway,
22 throughput, and functionality.

23 There was one -- there was one item
24 that we -- that was held open for six months that
25 was impacting the reliability, but it was

1 addressed.

2 221 Q. What was that?

3 A. Around the switches.

4 222 Q. Right.

5 A. Yeah.

6 223 Q. So you mean it was addressed
7 after -- six months after revenue service?

8 A. After revenue service, yeah.

9 224 Q. Okay. And what was that --

10 A. As a -- as a post revenue update.

11 225 Q. Okay. And what was that issue?

12 A. It was around the reliability of
13 the switch machines or -- or not -- sorry, not the
14 machines. Reliability of the switches to report
15 locked status, right? So when a -- when a
16 switch -- when a -- a little bit of background is a
17 track switch has to have two rails that are in --
18 in contact with each other, right? So that's when
19 the train goes around and takes a corner. But they
20 have to be locked, and there's another circuit on
21 them to ensure that they're -- that they're -- that
22 they're -- you know, that they're all the way over
23 and that they're immobilised, right? So if they're
24 a little bit open like that, you don't want your
25 train driving into them, because that will cause a

1 derail. So there's a circuits on there that -- so
2 a switch can be in place but reported to be maybe
3 not fully verified. And that's what they call --
4 and that goes into this thing called the switch
5 disturbed state.

6 And so through the switch machines, you
7 know, maybe not making connection or maybe having
8 some on-site problem, they would show as -- as not
9 fully secured, locked. And then the response to
10 the system is to say don't drive a train over this,
11 because we're not 100 percent sure that it's safe
12 to do so, right? And 100 percent actually means
13 like a double check.

14 So if there's any -- so the circuitry
15 verifies that the switch is all the way over and
16 that it's locked. And if it's anything less than
17 that, it won't allow the train to go over.

18 And with this guideway, if -- with two
19 tracks running parallel for 12 kilometres, if
20 one -- if you have a switch problem, then -- sorry,
21 every -- every train runs over every piece of track
22 and every switch. So when one switch goes down, it
23 causes a lot of haywire in the system. And that --
24 and that can be from a -- a -- a reduction in
25 service, right -- they have to switch tracks and

1 switch back -- or complete suspension of service,
2 right? You just -- you can't get -- you can't get
3 through either tracks.

4 226 Q. And did that occur following
5 service?

6 A. I think we saw a lot of -- I think
7 we saw several events in 2019 --

8 227 Q. M-hm.

9 A. -- through the first eight months
10 of service. But I wasn't tracking the reliability
11 reports on those. That was all within RTM and RTG.
12 I was sort of -- I taking a back -- I was off the
13 program substantially at that point.

14 228 Q. Are these reliability reports from
15 Alstom, do you know?

16 A. This would be the switch machines.

17 229 Q. Okay.

18 A. So they would be from our -- they
19 would be Rideau Transit Maintenance, RTM --

20 230 Q. Okay.

21 A. -- would be managing those in
22 terms of work reports and then the remedial effort
23 to -- to -- to improve reliability of the switches.

24 231 Q. And was that an item that you
25 expressed concern about being on the minor

1 deficiencies list?

2 A. Yeah, for 2019, they were, and two
3 components of it. One is the -- the mechanical
4 reliability of the switch and then the system
5 response to the failure. So they both need to be
6 improved. So that's also tied in -- and, again,
7 the switch is a complicated -- the switch is a
8 complicated machine, right, because it's -- it can
9 be affected by electrical concerns, it can be
10 affected by lack of oil, it can be affected by ice
11 or a -- or a heater not being fully tuned and --
12 and optimised, right? And they with work reliably
13 all day, and then you walk away, and they fail in
14 the middle of the night.

15 So it was a bug that the -- has been
16 plaguing the system a lot through the commissioning
17 and testing phase. So even a year before opening,
18 we knew the switches were -- were having
19 reliability problems. And so, yeah, that's
20 reported in many of our -- of our reports.

21 232 Q. And do you know what the response
22 was to that or why it wasn't resolved?

23 A. The engineering team was working
24 on it, and it was a combination of factors. I
25 wasn't privy to the final conclusion for it, but it

1 required an upgrade in maintenance procedures,
2 upgrade to the track switch heaters, and the -- and
3 the software change on zone controller.

4 233 Q. On the --

5 A. But they were -- all -- all those
6 substantial changes were done after revenue
7 service.

8 234 Q. Okay. Okay. But you don't
9 know --

10 A. I wasn't privy to the details on
11 those. That would be under the -- the RTM and the
12 OC Transpo groups were managing that afterwards.

13 235 Q. Okay.

14 A. So it was reflected in
15 Michael Morgan's deficiency letter and the remedial
16 plan.

17 236 Q. Okay.

18 A. But I wasn't involved in those
19 directly -- or indirectly. I was -- I was -- so --

20 237 Q. Were you aware of the terms sheet
21 that was signed to go into revenue service?

22 A. I was aware that there was one,
23 but I've not -- I'm not privy to it.

24 238 Q. So you were not asking for input
25 to it?

1 A. No, not directly. I provided my
2 inputs to Richard, he provided it to Michael, and
3 Michael did the terms sheet. So I was asked for
4 my -- my -- my items and -- and supported OC
5 Transpo and the City in its decision-making, but it
6 wasn't -- I -- I wasn't privy to the final result.

7 239 Q. What do you mean by -- like your
8 items? On what were you asking for?

9 A. Well, part of the -- just the --
10 just the regular status reports. You know, what
11 items are outstanding that are affecting the
12 system? I provided my evidence to Richard, and he
13 provided it up to the appropriate people within the
14 City.

15 240 Q. Okay. And --

16 A. But I -- I wasn't -- I wasn't
17 involved in it after that.

18 241 Q. Okay. And then in terms of items
19 outstanding, did you have concerns about any of
20 them -- about going into revenue service
21 availability with -- with the items you identified
22 as being outstanding?

23 A. The things I identified, they --
24 there was a -- there -- it's -- there were manual,
25 like, workarounds, right? So if switches aren't

1 reliable, you get somebody out there, you know,
2 manually addressing it, right? And it's -- it's --
3 and the risk is -- it was identified and, you know,
4 the -- and the -- the appropriate contractors
5 recognised it. And from what I saw, they were
6 doing what they -- they were taking reasonable
7 action to try and mitigate it.

8 But, yeah, no, I didn't have any
9 concerns about the -- you know, the impact to the
10 system --

11 242 Q. And --

12 A. -- at that point. It was
13 always -- you know there were always -- you know,
14 like, with any one of these system going -- going
15 open, we knew that -- we knew that issue was there,
16 and we knew it would impact, but we didn't know --
17 there's no way to know to what degree and to --
18 and -- and how it -- and how -- or to what degree
19 it would be mitigated in service.

20 243 Q. Which issue are you referencing
21 right now?

22 A. Again the switches, probably the
23 biggest one, yeah. So they have a problem with
24 the -- so the switches are reporting out -- out of
25 status. Can you get -- can you get somebody out

1 there to get it back in status, you know?
2 Probably. By and large, the failures weren't --
3 like, the thing didn't actually break, right? It
4 just got wobbly.

5 244 Q. Right. Is it fair to say it was
6 clear to everybody that there would be enhanced
7 pressure on maintenance following --

8 MS. RUSSELL: So --

9 THE WITNESS: I kind of can't talk to
10 that.

11 MS. RUSSELL: Yeah, sorry. I just
12 wanted to make a point that Mr. McCurdy can't speak
13 to what was clear to other people.

14 MS. MAINVILLE: Yeah.

15 BY MS. MAINVILLE:

16 245 Q. Was it clear to you that there
17 would be significant pressure on the maintenance
18 teams after revenue service?

19 A. I can't really answer that one way
20 or the other in terms of what the maintenance --
21 what the design is. There were -- you know, I
22 identified the concerns, and they were communicated
23 through the City to Rideau Transit Group and Rideau
24 Transit Maintenance, and, you know, they were the
25 competent -- they were the competent group and

1 responsible to manage them. Their ability to do or
2 not to so, they -- they -- that was part of, you
3 know, going on. We did see improvements, you know,
4 trending well through. Like when we first
5 identified the failures of the -- of the -- of
6 the -- of the switches in the vehicles in 2018
7 going forward, we did see a steady improvement in
8 them. They -- they were really quite frequently
9 failing when they first went out for, again, a
10 multitude of reasons. They were new, a lot of
11 things moving around still, still very much an
12 active construction site, things were still being
13 tested. So that was expected.

14 And then as we -- as they used them and
15 we ran the trains over them and we got more milage
16 on the system, we did see an improvement of
17 reliability all the way through 2019.

18 246 Q. Were you ever --

19 A. Trending -- so things were overall
20 trending in the right direction.

21 247 Q. Were you asked to provide an
22 opinion as to the readiness of the system or -- or
23 the train control system for operations?

24 A. Yeah, so I identified the --
25 the -- the items in the -- in the -- they were

1 captured in the deficiency list and the response to
2 the substantial completion package, right? So
3 what -- what were things in there that were still
4 missing? What were things we saw from the field?
5 What were things we saw from, you know lessons
6 learned from, you know, recent site failures?

7 And they were -- so they ultimately
8 were captured and managed part of the outstanding
9 terms sheet to a degree -- I haven't seen it -- and
10 the -- and the minor deficiency list.

11 248 Q. Did you provide an actual opinion
12 as to whether -- in considering those outstanding
13 items, whether the -- you thought the system was
14 ready for -- to go into service?

15 A. I don't provide comment as to
16 whether it was -- whether the whole system was
17 ready, but were there items of functional
18 reliability deficiency related to the train
19 control? I identified a number -- those through
20 the substantial completion responses and to the --
21 to the -- to the deficiency -- to the minor
22 deficiency list.

23 249 Q. And what -- what were those aside
24 from the switches?

25 A. Primarily the switches and

1 primarily the -- sort of the outstanding risk of
2 not having a final test.

3 250 Q. Okay.

4 A. Procedures or evidence or results.
5 So we don't know what it -- we -- so aside from
6 what we saw it do, we don't know if it -- what --
7 we don't -- we don't --

8 251 Q. M-hm.

9 A. -- have the pages to -- if it's
10 doing what it's supposed to do and if it's doing
11 everything that it -- if there's any outstanding
12 test, you know, failures on that.

13 252 Q. So based on what you were able to
14 observe, are you able to say whether the
15 integration testing was sufficient?

16 A. The integration testing was kind
17 of done by experience. So they put the state of
18 the power, the vehicle, the train control together,
19 and they ran it, right? And if the whole thing
20 runs, you're integrated. Right? So instead of --
21 it was done by demonstration of integrating it and
22 running it. So that's how, you know, you know if
23 your -- if your speed control is running the train
24 right is you actually do it and then watch it.

25 253 Q. But what's your view on the

1 sufficiency or adequacy on that?

2 A. Overall, it's -- no. Well, you've
3 asked a question about, you know, how -- how was
4 the integration testing done. The answer is you
5 integrate it and then run it. And then if the
6 overall -- and the -- and the end result is
7 successful, then your integration is successful.

8 And so that's always been -- that's
9 always been the procedure on these systems for --
10 you know, in -- in my experience. The final -- you
11 know, the final proof is in the field.

12 254 Q. Did you get a result for -- like,
13 was there -- did it pass the integration test? Did
14 you get that information?

15 A. We got test results from a
16 number -- we got -- we got a substantial set of
17 test results. The -- on the overall -- on the
18 overall system. So, like, the end-to-end travel
19 time results, we got a result for that.

20 But there were also functions in there
21 for, like, alarm disposition, schedule delay
22 recovery -- like if there's a delay, did that
23 recover -- that test was never really done. The --
24 as a follow -- as the form of commissioning tests,
25 that was never done. Were the trains departing in

1 the right amount of time that we expected them too?
2 Nobody really checked that.

3 So OC -- so you know, working with
4 OC Transpo, we basically started running a test on
5 the system as well to demonstrate what it did.

6 255 Q. Did --

7 A. Or -- or -- or if those tests were
8 done, we don't know about them, because they
9 weren't -- we didn't get the detailed procedures
10 nor the detailed test report.

11 256 Q. Okay. Did Thales express concerns
12 about the sufficiency of the integration testing?

13 MS. RUSSELL: Well --

14 THE WITNESS: No.

15 MS. RUSSELL: -- only --

16 THE WITNESS: I'm not privy.

17 BY MS. MAINVILLE:

18 257 Q. To you.

19 MS. MAINVILLE: I asked if anyone from
20 Thales expressed concerns to him.

21 THE WITNESS: No. And this was -- this
22 was their tests, right?

23 BY MS. MAINVILLE:

24 258 Q. Right. But do you know in terms
25 of the time that they were given to run these

1 tests, did that seem sufficient to you, or was it
2 very compressed?

3 A. Oh, they had time. The -- the
4 concern -- was there was certainly a pressure on
5 delivery to schedule, 'cause you remember, do you
6 live -- you -- you -- do you --

7 259 Q. In Ottawa?

8 A. Do you -- do you live in Ottawa?

9 260 Q. I know Ottawa, yes.

10 A. You know Ottawa? Were you in
11 Ottawa in 2018, 2017 walking around? Okay.
12 Anyway, there were signs on Queen Street saying
13 O Train 2018, right? 12 foot high all the way down
14 the street, O Train 2018. So 2018 came and went.
15 The -- there -- and there was certainly a
16 pressure -- a schedule pressure, right? And it
17 was, okay, we got it -- what -- and everything --
18 the -- the delivery and schedule, and you can see
19 this in schedule update, is they didn't put the end
20 schedule -- they didn't rebaseline the -- the
21 testing program to say, you know, the vehicles are
22 coming in here, the track's coming in here, your
23 testing window is now, you know, end of 2018,
24 beginning of 2019. The schedule said, you know --
25 again, you can find -- I sort of -- I don't have it

1 in front of me, but the schedules were always very
2 optimistic. You know, it was, yeah, everything --
3 30 days, we'll be ready to go. Plan -- plan to
4 launch end of 2018. We're going to make the end
5 date. So they would move six months, six months,
6 six months, six months. And so there was a
7 pressure to, you know, finish in six months, and
8 then it would move.

9 261 Q. M-hm.

10 A. And -- but, again, some -- and --
11 but at the end of it, it's -- they were looking for
12 a reliable vehicle, a reliable switch, a reliable
13 switch, and then they could test the train control,
14 because the train control ties everything together.
15 And so the track, the train, the switches, and the
16 power need to work first; then you can check out
17 your train control and run it to -- to demonstrate
18 reliability.

19 And so by delay in having vehicles go
20 out and then break in the middle of the test, you
21 lose -- you lose -- you lose the day, right?
22 Having a -- a switch machine fail, you go out, you
23 try to run a test where you got five trains out on
24 a run, one of the trains fail and the switch
25 machine fails, then you those week. And so they

1 were -- and you lose any benefit from that test.

2 And yeah. And, again, this happen --
3 again, I've commissioned five different systems
4 this way, and this is really quite -- this is not
5 abnormal, but it was -- you know, it was -- it was
6 a challenge in the way -- you know, they tried to
7 manage the unknown, right? Because, like, you have
8 a -- the -- go out, the vehicle has a problem, you
9 bring it back, you fix it, you put it back out, and
10 then you try to fix it again.

11 And there was a period where they were
12 doing -- doing a lot of that, but things were
13 slipping in terms of schedule.

14 But the -- so the -- the integration
15 testing was, I think, under some pressure because
16 of late reliable performance of the track and
17 the -- and the -- and the vehicles to support the
18 testing program.

19 262 Q. And did that last till the end of
20 the integration testing period or -- or -- or even
21 beyond?

22 A. They were able to complete the
23 tests, but it delayed -- you know, that was part --
24 that was part of the -- the -- the delay. And then
25 certainly there was a, you know, desire for RTG to

1 enter service.

2 263 Q. Right. And --

3 A. And so --

4 264 Q. And the City, I take it?

5 A. -- they got pushed, right? So
6 they got a -- you're -- you're sort of start of
7 testing gets sort of delayed by the sub systems,
8 and your end date is under pressure as well.

9 265 Q. Fair to say the City was also --

10 A. I -- I don't -- I'm not going to
11 comment on that.

12 266 Q. Well, you just commented on RTG,
13 so I'm just wondering on what basis are you able to
14 say that versus --

15 A. Because I saw the schedules that
16 RTG was sending.

17 267 Q. Okay. And you're not --

18 A. Yeah.

19 268 Q. -- able to say whether you
20 witnessed whatever you want to call it -- pressure,
21 incentivised, you know, or -- or sense of urgency
22 to be part of the City --

23 A. Yeah.

24 269 Q. -- to get to revenue service?

25 A. Yeah, their -- their -- their

1 desire was to gain the substantial completion
2 milestone at the first opportunity. And I could
3 see this by the -- by the letter they sent in
4 April.

5 270 Q. "They" being?

6 A. Rideau Transit Group.

7 271 Q. Okay. No, but I'm asking about
8 the City. You're not able to say -- you didn't
9 witness anything about whether the City was eager
10 to get to revenue service?

11 A. No, nothing outside of what the
12 mayor put in his press releases and things.

13 272 Q. The signs on Queen Street, were
14 those City signs?

15 A. Yeah, the City -- City of Ottawa
16 OC Transpo communications stakeholder management.
17 They were very excited to -- to -- to show the --
18 you know, in -- in 20 -- in 2013, they put up signs
19 saying revenue 2018.

20 273 Q. Right. Did -- in terms of full
21 integration testing --

22 A. M-hm.

23 274 Q. -- I understand in terms of the
24 trains running the full line, that was --

25 A. Right.

1 275 Q. -- only able to be done later
2 in -- well, fairly --

3 A. I'd have to --

4 276 Q. -- (indiscernible)?

5 A. -- check the schedules and that,
6 but, yeah, they didn't get the full end-to-end
7 running until 2018.

8 277 Q. Was it into 2019?

9 A. I'm thinking summer -- summer --
10 or -- or late -- late 2018, I think they got the
11 track in, track and power, and then -- and then the
12 vehicles started coming online.

13 278 Q. Was there from your perspective
14 enough time to -- to run the trains across the
15 whole line?

16 MS. RUSSELL: Sorry, counsel.

17 Mr. McCurdy may understand the question, but I
18 don't really understand your question. What do you
19 mean, enough time to run the train across the whole
20 line?

21 BY MS. MAINVILLE:

22 279 Q. Well, let me ask you first.

23 What -- what would be from your perspective the --
24 the amount of time that you would want to see the
25 trains running on a new system like this in terms

1 of dry running and -- and -- and going around the
2 full line prior to entering into service?

3 A. It's hard to say if the -- we
4 know -- I worked on a program -- let's see. I --
5 it's very -- it's really quite hard to say. You do
6 want to be able to have enough mileage or hours
7 running on the vehicles to shake out any -- any
8 hidden failures.

9 280 Q. M-hm.

10 A. Right? What that number is, it
11 would be the subject of a sort of more detailed
12 reliability analysis. And I think the schedule --
13 so I -- I'm not going to comment on that, but
14 the -- I think the schedule accounted for adequate
15 time to prove out the vehicles for -- before
16 revenue. The schedule -- the original schedule.

17 What it didn't factor in was sort of
18 any -- any unreliability issues on the vehicle
19 that -- that may be -- may be outstanding,
20 expecting -- but the vehicles have to perform up to
21 that reliability standard early. And then it's
22 just a matter of proving out the -- the -- the
23 reliability demonstration, right? So it's a matter
24 of -- and so once -- once they're operating well,
25 then there's a certain amount of time to prove it.

1 281 Q. Right.

2 A. They were a bit late in getting to
3 that level of performing.

4 282 Q. M-hm.

5 A. And so between the level of
6 performing and the level of proving, you can kind
7 of see where things are going there.

8 283 Q. Was the --

9 A. And so the schedule had enough
10 time for it --

11 284 Q. Okay.

12 A. -- if they were reliable at the
13 start.

14 285 Q. Okay. So, in fact, was there --
15 was there sufficient time to shake out all those --
16 the bugs on this before revenue service on this
17 project?

18 A. They -- you're kind of asking me
19 to look a bit in hindsight a bit on that. At the
20 time -- at the time, I don't think anybody can make
21 a confident call one way or the other.

22 286 Q. Okay.

23 A. Because we knew there were -- we
24 knew there were some bugs, but how big they were
25 going to be in the future would have been a call at

1 the time looking forward.

2 287 Q. Were you involved in trial
3 running?

4 A. Loosely. So I wasn't involved in
5 the -- I was on site during the trial running, and
6 I was -- when -- I was requested to be very hands
7 off during that period and let them -- let them
8 run.

9 288 Q. Were --

10 A. So not to be in any control rooms,
11 not to be in any rooms, not to do anything more
12 than just ride the train sort of as a passenger,
13 right, unless -- unless I may inadvertently ruin
14 things.

15 289 Q. Who made that request of you?

16 A. Well, that would be -- that would
17 be Eric Dubé. I said, Yeah, can I go in? As I
18 mentioned before, I would go on the site and
19 observe in the control room. But during the test
20 procedure, they asked nobody in the room that
21 didn't need to be there. And so I, you know,
22 politely said I'll take another step back and just
23 watch outside.

24 And that was also -- that was the
25 way -- that was the process of the trial running

1 was, you know, you run it like you're running
2 passengers, and when you're running passengers, you
3 don't have people doing site visits.

4 290 Q. What were your observations of
5 issues that the trains were encountering during the
6 trial running?

7 A. Limited. As I said, I wasn't in
8 the rooms, and I wasn't privy to the reports at the
9 end in terms of the, you know, reliability
10 failures.

11 291 Q. Okay.

12 A. I was still providing, you know,
13 feedback on the -- on the -- on the train control
14 testing, and I was available to be on -- on call to
15 provide support, and I think I visited a few sites
16 just to check on the status of some other elements
17 unrelated to the operations like telephones.

18 292 Q. Were you consulted about any
19 issues during the trial run?

20 A. No.

21 293 Q. So you weren't provided with
22 performance data reliability reports?

23 A. No, those were -- those were part
24 of the reliability demo team, and I was not privy
25 to any of those documents. I still have not seen

1 any of the reports -- of the results of that except
2 that trial running test.

3 294 Q. Okay. Do you know whether there
4 was automatic train control testing or train ATO
5 testing or...

6 A. The whole system was running in
7 automatic mode with this -- with all -- with all
8 the -- all the automatic scheduling and operation
9 functions.

10 295 Q. Would you expect Alstom have been
11 involved in that testing?

12 A. Alstom?

13 296 Q. Yeah.

14 A. Sorry. Can you clarify the
15 question?

16 297 Q. Well, aside from -- I take it --
17 of course Alstom would provide the trains --

18 A. Yeah.

19 298 Q. -- for testing. But aside from
20 that, would you -- would they be -- would you have
21 expected them to be involved in the -- in the
22 actual testing?

23 A. They -- they're -- they -- they
24 would have done -- I'm kind of speculating here.

25 MS. RUSSELL: Okay. If it --

1 THE WITNESS: It involved --

2 MS. RUSSELL: I don't want --

3 BY MS. MAINVILLE:

4 299 Q. But the question doesn't ask for
5 speculation.

6 A. Okay.

7 300 Q. Well, let me ask you first, did
8 you --

9 A. Okay.

10 301 Q. -- was Alstom involved, to your
11 knowledge, on -- in this testing beyond providing
12 the trains?

13 A. Okay. The testing being trial
14 running?

15 302 Q. No, no. The -- is it ATC or ATO
16 testing?

17 A. Well, the -- the -- the train
18 control is sometimes called CBTC. That's -- that's
19 the term they use. It's all same thing. It's the
20 train control. That is the -- like, the -- the
21 train control operates every -- like, sort of kind
22 of operates everything, so every -- every -- every
23 piece like the vehicle, the tracks, switches, the
24 power system, they feed into the train control, and
25 the train control then gives commands. So they all

1 have to be working before the train control can
2 operate effectively.

3 303 Q. M-hm.

4 A. Because if, you know, some parts
5 breaks, the whole thing stops.

6 The -- and Alstom was providing the
7 vehicle, and so they're responsible for delivery
8 and -- and the safe -- the consistent reliable
9 operation of that.

10 The overall tying of the trial running,
11 OTC was providing the operators onboard and at
12 central, and they provide the trains. And then the
13 trial running demo was, you know, let it go or --
14 or let it --run the daily service plan as you would
15 with passengers onboard.

16 304 Q. I don't think that was my
17 question.

18 A. Okay.

19 305 Q. Was Alstom involved in the CBTC
20 testing beyond providing the trains?

21 A. I don't know how to answer that.
22 I -- I -- in -- provide -- Alstom? They would do
23 their tests. They would not be doing the train
24 control test, because that would be a different
25 company.

1 306 Q. Okay. So --

2 A. And then -- yeah.

3 307 Q. So you wouldn't necessarily expect
4 them to be more involved with Thales on that
5 testing?

6 A. No, not beyond their own work,
7 which is -- not beyond their own scope, which is
8 the -- which is the vehicle operation and -- and
9 delivery of that.

10 308 Q. What knowledge do you have of
11 the -- any winter dynamic testing?

12 A. Yeah, 'cause I was there in
13 January 2019. That was a hoot. Well, I know it
14 was ongoing, but again, we weren't really invite to
15 witness the test, which was unfortunate.

16 But the winter dynamic testing, I don't
17 think much was done. We checked the reports --
18 we'll check the information on it, but they did
19 have a winter operations demonstration requirement.
20 And I don't have a test; I wasn't involved in the
21 oversight of those tests. I think OC Transpo had
22 people on site for that.

23 But, yeah, largely their -- their
24 winter management plan was to clear the snow off
25 the track before driving the train down, right? As

1 opposed to driving the train through the snow.

2 309 Q. Would you have expected to see
3 more for Ottawa's climate?

4 A. I don't think I can quite comment
5 on that. I expected to see more or less in winter
6 operations? If the track is clear, the train is a
7 train, right? It's -- it's okay. It became a
8 snow -- it became a snow management question. But,
9 yeah, there was -- you know, but this -- yeah,
10 the -- the performance of the train to operate
11 under a certain amount of snow was certainly part
12 of the project agreement.

13 And it would be interesting to
14 scrutinise that test result, because the vehicle,
15 as we saw, would -- when it encountered a bit of
16 snow would have problems continuing operation. So
17 it was incumbent to clear the snow before the train
18 went through, and I think that's reflected in the
19 maintenance procedures.

20 310 Q. Do you know when a decision was
21 made to reduce the number of trains running during
22 peak periods from 15 to 13?

23 A. I know roughly.

24 311 Q. When --

25 A. Because -- yeah, let me -- let me

1 double check this. Mr. Charter was involved in
2 that.

3 312 Q. Mr. sorry?

4 A. Charter. Troy. Troy. I'm sure
5 you've -- he's going to be a key --

6 313 Q. M-hm.

7 A. Yeah, he was in the meeting for
8 that -- for those discussions. I was sort of
9 brought in afterwards to try to look at the
10 scheduling, because I was -- I was doing the sub
11 work for the scheduling and delivering the service
12 plan, and so I was requested to modify the service
13 plan for a 15-train peak operation to a 13-train
14 operation and resolve how that work with launches
15 and recoveries.

16 314 Q. So do you -- do you recall whether
17 that was before trial running? Like, whenabouts
18 roughly?

19 A. That's a good question. It was
20 before revenue. Was it before trial? Good
21 question.

22 315 Q. Okay. What reason -- maybe let's
23 start here. What reason were you given, if any,
24 for the change?

25 A. Well, again, I wasn't really --

1 they didn't really owe my any reasons.

2 316 Q. It's not about that, but did you
3 receive --

4 A. Yeah.

5 317 Q. Did you --

6 A. I don't want to speculate to
7 somebody's else's decisions.

8 318 Q. I'm not asking you to speculate;
9 I'm asking what reason you were given.

10 A. That it was decided to open with
11 the 13 trains and hold back the last two. They
12 just weren't -- the vehicles weren't ready and they
13 weren't ready and running reliably. So they --
14 the -- the contract and project agreement said that
15 we needed a certain count. We needed 15 -- 32
16 fully revenue-ready trains to get completion. And
17 so how do you get -- so in order to carry
18 passengers with less than 32 trains, they needed to
19 modify that.

20 319 Q. And was that Troy Charter who
21 conveyed that to you?

22 A. Yeah, Troy -- Troy through
23 Richard, right? For the scheduling stuff, I was
24 kind of working for Troy's group on the operations
25 side. So I was asked to provide a -- a -- a

1 revised daily -- daily schedule plan that would
2 operate with 13 trains.

3 320 Q. Okay. But in terms of -- you said
4 Troy through Charter -- I'm sorry. I'll try that
5 again.

6 A. Troy -- yeah, Troy Charter and
7 Richard.

8 321 Q. Yes.

9 A. Right? Because they were the
10 two --

11 322 Q. Yes.

12 A. -- you know, operations and
13 construction side -- asked me to deliver a
14 schedule, because I -- I was delivering the
15 schedules at that point, for -- to command the
16 train control system to run with 15 trains during
17 the morning service or -- and to deliver them a
18 version that was modified that would only operate
19 with -- that would operate with only 13 -- that
20 would deliver service for the day having only 13
21 trains available plus spare.

22 323 Q. Right. In terms of the -- the --
23 the two trains not running reliably, was that
24 conveyed by Mr. Charter or Mr. Holder or both?

25 A. I didn't ask further.

1 324 Q. No, but who conveyed that?

2 A. I'd say Troy. Troy Charter.

3 325 Q. Aside from this reduction and the
4 number of trains, were you consulted about the
5 possibility of any progressive start or soft start
6 to an opening?

7 A. No. The -- the idea of a
8 commercial opening --

9 326 Q. Yes.

10 A. -- was something that Mr. Manconi
11 was not excited about, right? He was working
12 towards a full opening on -- on time, on schedule,
13 and challenging the Rideau Transit Group to deliver
14 that.

15 327 Q. How --

16 A. See, that was in -- part of --
17 that was part of a couple of his service
18 communications events. He says, We're going --
19 we're going -- we're -- we're -- we want to have
20 everything. But that was early. That was, like,
21 2018.

22 328 Q. What's the service communications
23 event?

24 A. Maybe it was just a meeting I was
25 in with him, and he was talking to somebody else.

1 But it seemed like, no, they were not -- they were
2 not in -- you know, he made a promise to -- he was
3 keen on delivering to the City full service, right?
4 And if there was going to be an adjustment to that,
5 you know, that hadn't -- that hadn't been -- yeah.

6 So I -- I'm -- yeah, let me just think
7 about this for a second. Yeah, so, no, there was
8 no discussion about opening partial service or
9 halfway service or what could we do getting out the
10 door. We weren't trying to negotiate internally as
11 to, you know, how can we carry -- how can we -- how
12 can we roll something earlier? That was not --
13 that was not conversation within the City. It was
14 not contemplated.

15 329 Q. It was a non starter?

16 A. That was a non starter, right?
17 We -- our objective with the -- with the City
18 oversight group was to oversee and verify full
19 delivery of the system from Rideau Transit Group as
20 per the contract.

21 330 Q. What do you know about the
22 decision not to have the yard be automated
23 ultimately?

24 A. I wasn't involved in that, but I
25 understand it. There was a -- it was a limitation

1 that the -- the vehicle factory was still there,
2 right? And so the maintenance building and the
3 factory and the yard were the same facility.

4 331 Q. M-hm.

5 A. And in order to get the vehicle --
6 get the yard up to automatic operation, you needed
7 to test it. In order to test it, you need to get
8 all the trains and all the maintenance work out of
9 it for a little while. And this continues to be
10 one of the barriers today. Oh, and you had to get
11 the construction team to stop tearing it apart,
12 because they expanded the yard halfway through the
13 program as well.

14 So in order to get the yard in
15 automatic operation, they needed to get the -- the
16 vehicle -- they needed to get the factory, the
17 maintenance, and some of the storage trains out of
18 it so that the -- the -- the top -- the -- these --
19 these -- like, the -- the wiring checkouts -- like,
20 the cable-by-cable checks could be done.

21 And you also needed a -- a substantial
22 period of time to prove out reliability on it, and
23 it was hard to do that when it was still being
24 used.

25 332 Q. Do you know whether this would

1 have impacted the later -- the derailments in the
2 yard? Like, the fact that -- could it have
3 contributed, the fact that it was not automated?

4 A. The -- well, as I talked about the
5 protection system and the protection system about
6 the -- the switches when they're -- when they're
7 firmly placed and locked, the train control
8 system's job is to make -- is to give permission
9 for a train to cross a switch among -- one of --
10 one of its jobs.

11 So when the switch is in place, the
12 train has permission to go across it. While the
13 train is going across, that switch can't move,
14 right?

15 333 Q. M-hm.

16 A. So that's -- that's -- that's the
17 protection function that it provides. So when the
18 passengers are driving around Hurdman, they go by a
19 switch, there's a large system that makes sure that
20 that whole track has solid integrity and the road
21 is clear.

22 That system in the yard is turned off,
23 so it's -- you can move a switch and a train
24 anywhere.

25 334 Q. Did you have any interactions with

1 Roger Woodhead from the engineering joint venue,
2 the RTG engineering joint venture? Or he -- he was
3 with SNC?

4 A. No, I don't know that name.

5 335 Q. Okay.

6 MS. RUSSELL: Oh, counsel, sorry, I
7 just wanted to pop in for a minute. I'm just
8 looking at the time and wanted to get a sense of
9 where you're at.

10 MS. MAINVILLE: I have five more
11 minutes, given that we took the time for the
12 spelling instead earlier, I would ask.

13 MS. RUSSELL: Yeah, no, I'm not saying
14 that -- asking you to stop. I'm asking you what's
15 your sense of how much more timing you have.

16 MS. MAINVILLE: I would say five more
17 minutes.

18 MS. RUSSELL: Okay. Thank you.

19 BY MS. MAINVILLE:

20 336 Q. Can you tell me, you've worked at
21 Thales and you're -- you're an expert in the CBTC
22 system as I understand it. So can you tell me
23 how -- whether this was a new design for Thales on
24 this -- on this train?

25 A. No, it's a very established

1 platform. The -- the system -- yeah. So it's a
2 very established platform. So the product that
3 Alcatel delivered is probably -- well, it's -- it's
4 a thing -- they do a thing called baseline. So
5 take a product that's been delivered in revenue on
6 a prior project and then will customize it to the
7 particular site.

8 337 Q. M-hm.

9 A. Right? So they have a common --
10 what they call a common product, but effectively
11 the product evolves through different field
12 deliveries.

13 So they took the same train control
14 product -- like, the -- the fundamental part of it
15 is what they delivered in Shanghai, Singapore,
16 Edmonton, England, right? Those guys. The -- and
17 they have some mileage on them, right? So that's
18 how they know the interlocking works, how the
19 switch machine works, and basically they have a --
20 a -- 70 -- 70 percent of it is sort of off the
21 shelf or pre -- pre established. And a similar
22 thing with hardware, the switch machines. The
23 switch machines are using a product that's been
24 delivered for 20 years.

25 Of course, every time you build

1 something, you kind of -- you know, you may not
2 have the same factory where you built the last one,
3 so you kind of have a little bit of a different
4 factory. You may have different screws, right, to
5 use a very -- so there's little manufacturing
6 variances going forward. And then they customize
7 it to the new guideway, the new customer, then the
8 new -- and the new train. So it's -- the product
9 baseline is very -- is -- is -- is -- is mature,
10 it's been used in another program, it's
11 established, but then they bring it over here, and
12 they start modifying it to the new system.

13 338 Q. And did this project require more
14 customization than the usual project -- the typical
15 project?

16 A. I wouldn't -- I don't know. You
17 can't -- more or less, I -- I wouldn't say
18 anything -- I wouldn't say no. Actually, this
19 is -- compared to some of their other programs, it
20 required a minimum amount of customisation, because
21 as a customer, we were -- we were very happy to
22 accept things off -- sort of, like, functionally to
23 the -- you know, the functional off-the-shelf
24 design, we were very happy to accept. And that's
25 good, because I've worked with customers who had

1 great ideas about, you know, building new ways of
2 doing things and very specific ways, and those
3 always end up causing more problems.

4 339 Q. Do you know if this --

5 A. We're trying to find it.

6 340 Q. Sorry, do you know if this was the
7 first time that it interfaced with Alstom on a --
8 on a -- on an LRT?

9 A. It's the first time it's
10 interfaced with this vehicle.

11 341 Q. Did --

12 A. Yeah.

13 342 Q. Do you know of challenges that
14 that occasioned on this project?

15 A. I couldn't say challenges, but the
16 interface design is always a challenge on these
17 things. It's always a big -- because the
18 vehicle -- it's not just a truck, right? It's a
19 whole computer network with power systems and doors
20 and announcements and -- and -- and, you know, it's
21 like it's -- it's -- effectively, you're trying
22 to ride -- the -- they're -- I kind of -- I kind of
23 liken them to little airplanes, right, in terms of
24 level of complexity. There's multiple onboard
25 controllers, and so the complexity of the interface

1 is always there.

2 The -- so -- but, yeah, it's part of
3 every project to do that. It was schedule
4 pressure, because they first integrated to the
5 vehicle on site pretty late in the game. And
6 they -- they were doing -- so -- so both the
7 vehicle and the train control system were kind of
8 changing as -- as you went through. But they
9 eventually -- but they did stabilize around 2018,
10 right? So they both kind of stabilized.

11 There was a lot of iterations. Again,
12 very normal, because you got two -- you got two
13 complicated systems with two companies who are --
14 are -- who are working together on it.

15 But in terms of the customisation, no,
16 I think the customization is very good, because we
17 didn't include any -- the City didn't put any
18 complications on the train control design. And by
19 complications, I mean a different signalling
20 system.

21 In Singapore, there was two signalling
22 system on top of each other, and they had to
23 handshake and hand over. Complications.

24 And we -- and we had a green -- we had
25 a blank -- a -- a green field, a brown -- a

1 green -- a green -- a green system, and they could
2 do very -- and they could -- and they had full
3 control over it.

4 So, yeah, in terms of the -- the
5 product, it was very -- very -- it was kind of a
6 simple -- the key safety functions were very simple
7 to, because we -- the City didn't put any
8 complications on them.

9 343 Q. In terms of the later breakdowns
10 and derailments that the system encountered, aside
11 from what you've already mentioned in terms of the
12 switches and whatnot, are there others that you --
13 well, are you able to speak to -- let me rephrase.

14 Some of the issues you witnessed --

15 A. Okay.

16 344 Q. -- during the testing phase and
17 commissions phase, do you see any of those as
18 having contributed to or potentially contributed to
19 some of these issues that the trains later
20 encountered; for instance, door issues, issues with
21 the overhead catenary system, or anything like
22 that?

23 A. There's nothing in the train
24 control that was going to do that. The -- but in
25 terms of the -- in terms of the testing and

1 integration program, right, when we ran the -- when
2 we ran the -- the field trial and the demonstration
3 programs, when there was a failure -- well, first
4 of all, things like the -- things like the doors,
5 right, we ran the doors complete -- we -- we ran
6 the -- the testing that was done was minimal. And
7 this is across the system. The tests were done in
8 terms of we need to see the doors open and close.
9 The doors open, the doors close, test passed.
10 Done. Good. You know, go, go, go, go, go, right?

11 Nobody stuck a foot in the door, right?
12 And -- and nobody opened the door and kicked it.
13 So -- and so those kind of, you know -- if we
14 didn't have the door must withstand an impact of,
15 you know, one elbow's worth, you know, one time out
16 of 10, we didn't put that in spec, 'cause it's a
17 performance-based spec. The whole thing needs to
18 work.

19 So things like the failures and
20 environmental concerns and the -- the -- the
21 robustness of the environment -- so how much snow,
22 how much water, how much passenger shaking, how
23 much vibration, how much load on the -- on the --
24 on the -- how much, you know, current load does the
25 power system in the vehicle need to work together,

1 the City didn't have -- it wasn't the City's job to
2 put those in the project agreement, and all of
3 those sort of interface risks -- so interface with
4 passengers, interface with driver, interface with
5 the -- the -- the vehicle and the power system, how
6 those worked together was entirely out of the
7 City's hands.

8 And that's part of downloading the risk
9 under the P3 model, right? Is -- is -- is Rideau
10 Transit constructors groups and the maintenance --
11 had to make sure those all worked, and they had
12 free hand in either, you know, getting this system
13 or that system or this procedure or that work
14 around, you know, to do it. If your power is
15 overloading, you could use less power or you can
16 build a bigger capacitor. That's one example;
17 that's not the example here. But they had -- that
18 was -- down -- so the City didn't get involved
19 in --

20 345 Q. Yeah, but that wasn't my --

21 A. -- (indiscernible) those functions
22 were, because --

23 346 Q. Yeah.

24 A. -- that was the integrator's job.

25 347 Q. Okay. That wasn't my question,

1 though.

2 A. Okay.

3 348 Q. Did --

4 A. Well...

5 349 Q. I -- would -- let me ask a
6 follow-up question.

7 A. Okay.

8 350 Q. Is there -- is there -- are these
9 types of things like would an -- what happens if an
10 elbow is -- you know, goes through, are these
11 things that you often see or are standard or as
12 part of the testing?

13 A. Kind of not so much, really.
14 Like, that particular one, no, that would have
15 been --

16 351 Q. No.

17 A. -- done by -- that particular one,
18 that one sticks in my mind, because that would have
19 gotten -- that would have gotten found by every --
20 like -- like, no -- we never -- there's no -- no
21 project I worked on has checked that, right? We
22 just kind of assumed that the doors were robust,
23 right? We never did a -- we never put a robustness
24 requirement on them, right? So that's something
25 I'm going to take forward as a lesson.

1 The -- but that kind of -- the things
2 you don't think about that sneak up -- because we
3 didn't put them in the project agreement, we didn't
4 put them in the contract that the City needed to
5 see demonstrated, the test -- the top level test
6 just demonstrated to the contract. So anything
7 that we didn't put in the contract may or may not
8 have been tested, may or may not have been checked,
9 may or may not have been diligent. We as -- as
10 City oversight, we were very limited on what we
11 could identify.

12 352 Q. Okay. But again, like, so my
13 question is not about City oversight or what's the
14 City's responsibility versus --

15 A. Okay.

16 353 Q. -- (indiscernible). I'm just
17 trying to understand, like, would a contractor --
18 and if you can't answer, you can't answer. But
19 based on your experience, like, is that something
20 the contractor would typically test or -- or not?
21 Or is it a lesson learned, as you're -- as you're
22 saying?

23 A. Well, these would be lessons --
24 these would be lessons learned, but it comes down
25 to, you know -- like, they -- like, the items

1 that -- the items that sort of cause these
2 failures, how could we have prevented it or caught
3 it or -- or who should prevent it or how it be
4 prevented is -- is -- is definitely going to be
5 some lessons learned going forward.

6 Our -- our tests -- to say the tests
7 weren't complete or -- or -- or could we have --
8 and so the question kind of goes to, you know, had
9 we held off and had we continued to test more,
10 would we have caught these things? And nobody
11 knows. But some point -- so -- so that -- that's
12 one of the challenges going back.

13 354 Q. Okay.

14 A. But in terms of, you know, testing
15 the interface to snow or testing the interface to
16 passenger abuse and boarding, yeah, they weren't --
17 they weren't part of the test program. And so when
18 we did hit the field and we did hit those
19 conditions, it didn't -- it didn't -- it -- it --
20 those were the -- those were some of the areas that
21 it had challenges.

22 355 Q. Okay. I guess I'm still unclear
23 as to whether you would normally expect these to be
24 part of the program or not, not necessarily --
25 and -- and looking forward, though, you would --

1 you -- you think you would want --

2 A. Yeah, it's --

3 356 Q. -- it. If you're devising that
4 program, would you have thought of it at the -- you
5 know, was it something that was standard or not?

6 A. Not so much.

7 357 Q. Okay.

8 A. Not so much. Like, every -- I
9 put -- I put three systems in the vehicles. We
10 never -- we -- we've never kicked the doors through
11 testing, right?

12 358 Q. Okay.

13 A. Because you might break it, right?
14 And you don't want to do it. And how much do you
15 kick it? We don't know. So that one -- that one
16 would have gotten by everybody.

17 359 Q. Okay.

18 A. But, similarly, it's -- you know,
19 yeah, no, we don't know why that one -- that one
20 got through. But we -- but things like that in
21 terms of, you know, the diligent -- we didn't think
22 to ask the question either, right? But, you know,
23 should the City have asked the question? And, you
24 know, no, we didn't, and nobody else did. And so,
25 yeah, that got -- that got through. But that kind

1 of would have gotten through everybody, I think.

2 360 Q. Yeah.

3 A. Yeah, in terms of the -- sorry.

4 Did that answer your question?

5 361 Q. I think, yes.

6 A. Okay.

7 362 Q. I just want to give you an
8 opportunity to -- are there other -- because you
9 said a lot of lessons learned. You know, what --
10 what are other lessons learned that you think
11 might be relevant to our mandate in terms of
12 looking ahead and making recommendations for a
13 future project?

14 A. Yeah, that's a good one. Yeah,
15 I'd say more -- there -- there should remain some
16 level of -- of oversight enforceability on it in
17 terms of, you know, as the -- the integrator and
18 the quality work is given to the -- the projectco.
19 You know, we should -- we should at least -- the
20 City should at least retain the ability to, you
21 know, get detailed documents along the way to be
22 able to monitor and be able to flag any -- and --
23 and -- and be able to address any -- any issues
24 earlier on.

25 363 Q. And I just have one --

1 A. Yeah.

2 364 Q. I just have one -- what I think is
3 a quick question, but...

4 A. Okay.

5 365 Q. In terms of journey time
6 requirements, just going back to that issue of --

7 A. Okay.

8 366 Q. -- journey time --

9 A. Yeah.

10 367 Q. -- should -- should there be
11 different requirements or expectations based on
12 inclement weather for --

13 A. Good point.

14 368 Q. -- a (indiscernible) system like
15 this?

16 A. Yeah, we didn't account for --
17 yeah, and again, we -- we didn't account for
18 alternate modes of operation, right? So the --
19 the -- the requirement is written for a dry rail
20 situation, right? So under -- so that number works
21 for dry rail. Should we have a wet rail number?

22 369 Q. Right.

23 A. I don't know. We don't. The --
24 but, yeah, we do have some wet rail conditions.
25 What -- what should the number be for that, and how

1 would you determine that up front, right? That
2 would be the question. So, yeah, it's -- it's
3 going to take a bit. There -- there is -- the
4 trains do travel slower under wet weather. We --
5 the project agreement didn't account for that.

6 It assumed that the -- a part of that
7 also is the wheel rail -- the wheel rail adhesion
8 is the projectco's job, right? So if it works, if
9 it starts getting slippery under wet weather, you
10 know, that's just -- it's -- it's their -- that's
11 part of -- like, the City didn't inspect that
12 number either. So we can say -- yeah.

13 370 Q. So it -- is it something that's
14 not typically provided for and it wasn't in this
15 case, or it's not common in the industry to your
16 knowledge?

17 MS. RUSSELL: Well, sorry --

18 THE WITNESS: It's not common in terms
19 of the performance requirement for the system, no.
20 I've never -- I've never seen it. We've always had
21 the -- the -- the journey time -- conditions for
22 the journey time are established in the dry rail.
23 So if you change the condition, does that end time
24 change?

25

1 BY MS. MAINVILLE:

2 371 Q. M-hm.

3 A. It's a defined condition. How
4 much should it change is something that we couldn't
5 really evaluate. I wouldn't even try to evaluate
6 it in a contract going forward, because it's
7 subject to, you know, a whole bunch of other design
8 decisions down the road.

9 MS. MAINVILLE: Right. Okay. I
10 apologise for going over. Some answers were longer
11 than anticipated. But can I just check if my
12 co-counsel has any critical questions to ask,
13 and --

14 MS. PEDDLE: No, I don't. Thank you.

15 MS. MAINVILLE: Thanks. Allison, is
16 there anything you wanted to follow up on?

17 MS. RUSSELL: There may be. I wanted
18 an opportunity to go through my notes. What I'm --
19 given the time and just because of what my
20 expectation was for today's examination, I'm going
21 to ask that if there's any follow-up questions that
22 I might have, if I could -- if I could communicate
23 that to you, and we can deal with it by that --
24 that way.

25 I didn't have follow-up questions in

1 the last examination. I don't know that I will in
2 this one. I just -- I'm just really cognizant of
3 the timing here.

4 MS. MAINVILLE: Okay. Okay. So you
5 mean you'll convey them, and then we can address
6 them as --

7 MS. RUSSELL: Yeah, if we -- if
8 necessary.

9 MS. MAINVILLE: -- needed? Yeah, okay.
10 Okay. We can go off record.
11 -- Upon concluding at 5:19 p.m.

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1 REPORTER'S CERTIFICATE

2
3 I, Eveliene Symonds, BA, CSR(A),
4 Certified Shorthand Reporter, certify;

5 That the foregoing proceedings were
6 taken before me at the time and place therein set
7 forth, at which time the witness was put under oath
8 by me;

9 That the testimony of the witness
10 and all objections made at the time of the
11 examination were recorded stenographically by me
12 and were thereafter transcribed;

13 That the foregoing is a true and
14 correct transcript of my shorthand notes so taken.

15 I further certify that this
16 questioning was conducted in accordance with the
17 Protocol for Remote Questioning, Revised
18 05/05/2020.

19 Dated this 4th day of May, 2022.

20
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