

Ottawa Light Rail Commission

Troy Charter
on Wednesday, April 13, 2022



77 King Street West, Suite 2020
Toronto, Ontario M5K 1A1

neesonsreporting.com | 416.413.7755

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

OTTAWA LIGHT RAIL COMMISSION MEETING
CITY OF OTTAWA - TROY CHARTER
APRIL 13, 2022

---- Held via Zoom Videoconferencing, with all
participants attending remotely, on the 13th day of
April, 2022, at 2:00 p.m. to 5:00 p.m.

1 COMMISSION COUNSEL:

2

3 Kate McGrann, Co-Lead Counsel Member

4 Carly Peddle, Commission Counsel Member

5

6 PARTICIPANT:

7

8 Troy Charter

9 Peter Wardle, Esq. Singleton Urquhart Reynolds

10 Vogel LLP counsel for Mr. Charter

11 Zach Flemming, Esq. Singleton Urquhart Reynolds

12 Vogel LLP

13

14 ALSO PRESENT:

15

16 Colleen Rea, Stenographer/Transcriptionist

17 Laila Butt, Virtual Technician

18

19

20

21

22

23

24

25

1 INDEX OF UNDERTAKINGS
2
3 The questions/requests undertaken are noted by U/T
4 and appear on the following pages: 100
5
6

7 INDEX OF EXHIBITS
8

9 NUMBER/DESCRIPTION	PAGE/LINE NO.
10 1 Resume of Mr. Charter.....	7

11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

1 --Upon commencing at 2:00 p.m

2 TROY CHARTER: SWORN.

3 MS. MCGRANN: Good afternoon,

4 Mr. Charter. My name is Kate McGrann. I'm one of
5 the co-lead counsel for the Ottawa Light Rail
6 Transit Public Inquiry. I'm joined today by
7 another member of our counsel team, Carly Peddle.

8 I'm just going to provide you with some
9 information about the purpose of the interview
10 today and how the evidence that you give will be
11 used, and then we'll get started with the
12 questions.

13 So the purpose of today's interview is
14 to obtain your evidence under oath or solemn
15 declaration for use of the Commission's public
16 hearings. This will be a collaborative interview
17 such that my co-counsel may intervene to ask
18 certain questions. If time permits, your counsel
19 may also ask follow-up questions at the end of this
20 interview.

21 This interview is being transcribed,
22 and the Commission intends to enter this transcript
23 into evidence at the Commission's public hearings
24 either at the hearings or by way of procedural
25 order before the hearing is commenced.

1 The transcript will be posted to the
2 Commission's public website along with any
3 corrections made to it after it is entered into
4 evidence.

5 The transcript, along with any
6 corrections later made to it, will be shared with
7 the Commission's participants and their counsel on
8 a confidential basis before being entered into
9 evidence. You will be given the opportunity to
10 review your transcript and correct any typos or
11 other errors before the transcript is shared with
12 the participants or entered into evidence. Any
13 non-typographical corrections that you make will be
14 appended to the transcript.

15 Pursuant to Section 33(6) of the
16 Public Inquiries Act 2009, that section provides a
17 witness on an inquiry shall be deemed to have
18 objected to answer any question asked of him or her
19 on the ground that his or her answer may tend to
20 incriminate the witness or may tend to establish
21 his or her liability to civil proceedings at the
22 instance of the Crown or of any person, and no
23 answer given by a witness at an inquiry shall be
24 used or be receivable in evidence against him or
25 her in any trial or other proceedings against him

1 or her thereafter taking place other than a
2 prosecution for perjury giving such evidence.

3 As required by Section 33(7) of the
4 Public Inquiries Act 2009, you are hereby advised
5 that you have the right to object to answer any
6 questions under Section 5 of the Canada Evidence
7 Act.

8 With respect to today's interview,
9 if you need to take a break at any time, just let
10 us know and we will do so. Do you have any
11 questions about any of that?

12 MR. CHARTER: No, I don't.

13 MS. MCGRANN: Then if at any point
14 during this interview you need to take a break,
15 just let us know and we will go off the record and
16 take breaks as needed.

17 MR. CHARTER: Thank you.

18 MS. MCGRANN: Just to get started, we
19 had asked your counsel to provide us with a copy of
20 your resume. I am showing you what we received.
21 So it looks like this is a three-page document --
22 this is a four-page document. I've scrolled
23 through it rather quickly once, and I can scroll
24 through it again on your direction, but my question
25 for you is do you recognize this document?

1 MR. CHARTER: I do.

2 MS. MCGRANN: Is this a copy of your
3 resume?

4 MR. CHARTER: Yes, I mean with the
5 caveat that it hasn't been updated in a little bit
6 of time, but yes, that is my current resume that
7 needs to updated, but that is it.

8 MS. MCGRANN: Great. I am having a
9 little bit of trouble hearing your answers from a
10 volume perspective, and also they are a bit choppy.

11 MR. CHARTER: Okay. I -- hopefully --
12 I'll bring it a little closer, and I'll try to make
13 sure I speak directly towards the microphone.

14 I do recognize that that is my resume.
15 You know, it does require a bit of updating over
16 some of the work over the past couple of years, but
17 for the most part, that is an accurate reflection
18 and that is my document.

19 MS. MCGRANN: So we'll have that
20 entered as Exhibit 1.

21 EXHIBIT 1:

22 Resume of Mr. Charter

23 MS. MCGRANN: Should we take anything
24 from the fact that some of the text from this
25 resume is highlighted in red? Anything in

1 particular that that is meant to communicate to us?

2 MR. CHARTER: No, it was just -- you
3 know, it was just highlighting to myself areas in
4 which I wanted to update or add some additional
5 information when I got around to updating my
6 resume.

7 MS. MCGRANN: I just want to run
8 through what I understand to be your positions
9 during the relevant time. Am I right that you
10 joined Transit Operations support staff as a
11 program manager in 2011?

12 MR. CHARTER: About that, yes.

13 MS. MCGRANN: And in that role, did you
14 have any involvement in stage one of the Ottawa
15 Light Rail Transit System as it existed at the
16 time?

17 MR. CHARTER: No, I did not.

18 MS. MCGRANN: And then in 2012, you
19 become manager of Transit Operations?

20 MR. CHARTER: That's correct.

21 MS. MCGRANN: And just from the
22 terminology perspective, we also see reference to
23 OC Transpo. Are Transit Operations and OC Transpo
24 the same thing at the City or are they two
25 different things?

1 MR. CHARTER: Transit Operations is
2 within OC Transit. It's one and the same.

3 MS. MCGRANN: Okay. And in your role
4 as manager of Transit Operations between 2012 and
5 2014, did you have any involvement in stage one of
6 Ottawa's LRT?

7 MR. CHARTER: No, I did not.

8 MS. MCGRANN: In 2014 you become
9 assistant general manager of Transit Operations?

10 MR. CHARTER: Yeah, the title was
11 changed to director, but yes.

12 MS. MCGRANN: I think you become a
13 director in 2016; is that right?

14 MR. CHARTER: Yes.

15 MS. MCGRANN: Okay. And at one point
16 do you begin to do work that's related to stage one
17 of Ottawa's LRT?

18 MR. CHARTER: It's around that time.
19 It's around that point 2015 time period that I'm
20 involved planning for the operational stage of the
21 rail operations. I take on that role we're also
22 just finishing up an expansion project of line two,
23 so I was involved in operationalising that line,
24 and that's when I start to get involved to a
25 certain degree in the rail side of things for line

1 one but not from.

2 (TECHNICAL DIFFICULTIES)

3 MS. MCGRANN: Can we go off the record
4 for a moment.

5 -- OFF THE RECORD DISCUSSION --

6 MS. MCGRANN: I think before we took a
7 little break there, you had been talking about when
8 you started doing work related to stage one of
9 Ottawa's Light Rail Transit System. Do you mind
10 just giving us your answer again?

11 MR. CHARTER: Sure. You know, it's
12 when I became the director or associate assistant
13 general manager position that I started to get
14 involved in the rail side of things. My primary
15 focus in the early days was we were just finishing
16 up the extension or the expansion of our Trillium
17 Line, line two. So I took over that responsibility
18 as our rail construction program was finishing up
19 the infrastructure work, and that's when we started
20 to get -- I started to get introduced and involved
21 in the planning and the operationalization of the
22 line one, so the Confederation Line.

23 MS. MCGRANN: And were you taking over
24 a role that had been performed by somebody else
25 before you stepped in in around 2015 or 2016?

1 MR. CHARTER: You know, at the time
2 there was -- we had a new general manager
3 Mr. John Manconi came in, and he reorganized the
4 department. So I did, obviously, take over for
5 someone who left the City. But, you know, it was a
6 new role with a new packaging of duties and
7 responsibilities.

8 MS. MCGRANN: Okay. And with respect
9 to the -- I'm going to try and say the word you
10 said, with respect to procuring operations; is that
11 fair?

12 MR. CHARTER: Yes. There you go.

13 MS. MCGRANN: With respect to preparing
14 for operations, were there already people who were
15 doing work on that task or set of tasks when you
16 started working on it?

17 MR. CHARTER: No, there was not.

18 MS. MCGRANN: And can you describe to
19 us what your work in preparing for the operations
20 looked like? What did it involve?

21 MR. CHARTER: So, you know, obviously
22 it was done over several years, but, you know, it
23 starts off with, you know, creating of job
24 descriptions, recruitment and selection of the
25 people for those positions, determining what the

1 workforce size would be, what the impacts are in
2 terms of, you know, the bus network to the rail
3 network, then developing all the standard operating
4 procedures, practices, processes that we need to
5 have in place to run the day-to-day operations.

6 So, you know, simple things as lost and
7 found procedures to something more safety focussed
8 like hours of service and fatigue management
9 principles and practices.

10 So, you know, you're looking at all
11 those procedures, processes, practices that we need
12 to have in place come day one when the rail line
13 was up and running.

14 As well, obviously, there was things
15 that we needed to put in place, you know, leading
16 up through the testing commissioning as well as
17 through the trial running period. So it was -- a
18 lot of it was making sure we had the right people
19 in the positions and, you know, we had the right
20 procedures in place to be able to test connections,
21 trial run and then ultimately to operate.

22 MS. MCGRANN: The standard operating
23 procedures and things like that, are those gathered
24 together somewhere in an overall operations binder
25 or otherwise collected in one place?

1 MR. CHARTER: Yeah. So I mean we do
2 have, obviously, a fairly large organization, so we
3 have standard operating procedures that are
4 specific to bus, conventional bus service to OC
5 Transpo Service, but then we have a whole suite of
6 operating procedures that are specific to rail.
7 And you also have, you know, a number of procedures
8 and practices that, you know, overarch depending on
9 whatever that -- you know, if there was an impact
10 to OC Transpo in general how would we respond
11 versus an impact to rail how would we respond.

12 So there's some operating procedures
13 that overarch the entire organization and then
14 there's some that are specific to rail.

15 MS. MCGRANN: With respect to the
16 operating procedures that are specific to rail,
17 were you working with anyone from the RTG side of
18 the project to prepare any of that material?

19 MR. CHARTER: Yes.

20 MS. MCGRANN: Can you tell me what that
21 working relationship looked like?

22 MR. CHARTER: Yes. So there was a
23 variety of working groups that were established
24 throughout the construction period that, you
25 know -- obviously, we needed to get information

1 from the constructor from ORT or RTG to help inform
2 what our operating procedures were going to be.
3 So, you know, we need to know how the
4 computer-based training control system was going to
5 operate and that would determine, you know, the
6 training requirements for our staff. We needed to
7 know how the scada system which basically it's the
8 monitoring of all the devices on the rail line and
9 gives our control centre alerts and notifications,
10 you know, that we need to respond to. So we needed
11 to know how that was going to function.

12 So largely we're collecting information
13 from, you know, through the rail construction
14 program or directly through RLT and through these
15 working groups and ongoing discussions, and that's
16 how we're formulating and creating our standard
17 operating procedures and responses.

18 MS. MCGRANN: Okay. And at the outset
19 of the work that you did, did you or anybody else
20 at OC Transpo put together a schedule for the
21 preparatory work that you have described to us
22 setting out what needed to be done by what time in
23 order for OC Transpo to be ready to accept handover
24 of the system?

25 MR. CHARTER: Yes, we did, and I know

1 our rail construction program they had a number of
2 spreadsheets that were tracking towards completion.
3 So yes, there were milestones and, you know, for
4 example, you know, to have staff trained to run the
5 control centre, obviously you needed to know what
6 the functionality was in advance of hiring of the
7 people, and that then in turn informed what the
8 training requirements were. That all had to be
9 done in advance of the testing trial commissioning
10 trial running.

11 MS. MCGRANN: With respect to that
12 schedule, were there any major changes or delays to
13 that schedule?

14 MR. CHARTER: Yeah, there obviously
15 were. You know, the schedule was challenged
16 several times in that getting information in a
17 timely manner was a challenge for my colleagues.
18 And there were delays in opening up the line. You
19 know, we opened the line a little over a year later
20 than what was originally anticipated. So yeah,
21 there were some considerable delays that affected
22 ultimately the service launch, but it affected the
23 various staff that needed to get towards that point
24 too.

25 MS. MCGRANN: You've mentioned a couple

1 of specific pieces, so I'll ask you about those
2 first. With respect to the CBTC system, I'm
3 describing that properly, any issues getting
4 information or delays to the schedule otherwise
5 that impacted OC Transpo's ability to prepare to
6 receive that aspect of the system?

7 MR. CHARTER: Yeah. I know that, you
8 know, when one of the submissions from RTG
9 indicating that they thought they'd achieve revenue
10 service availability or the go forth for trial
11 running, you know, they hadn't been able to
12 demonstrate all the requirements from the CBT
13 system, so that was one of the impediments to
14 moving forward with service launch.

15 MS. MCGRANN: And did that impact on OC
16 Transpo's ability to accept the system?

17 MR. CHARTER: It impacted our ability
18 to launch the system. It constrained our ability
19 to prepare, but no, I do not believe that it
20 impacted our ability once we were able to start
21 running.

22 You know, we were able to develop --
23 obviously, the training had to be initially
24 developed from ORT and RTG but no, it didn't impact
25 our ability to run our system when it became

1 available to us.

2 MS. MCGRANN: For now I want to focus
3 on your ability to prepare to run not run. So you
4 said it did constrain your preparations I think.
5 How did it constrain your preparations?

6 MR. CHARTER: Well, you know,
7 everything gets condensed down into a shorter
8 period of time. And, you know, the work was able
9 to get done, but, you know, you're reviewing
10 information, you're creating documents, and, you
11 know, you're doing it in a constrained period of
12 time, and obviously there's a lot of information
13 that comes in and a lot of information that needs
14 to be digested and reviewed. But that's why in OC
15 Transpo we brought in additional subject matter
16 experts to help assist us in preparing for that.

17 So we brought in, you know, subject
18 matter experts that had experience, you know, in
19 Philadelphia, in Dallas, in Boston, the Hudson
20 Bergenline in New Jersey. We brought in all these
21 experts and they helped us to digest that
22 information and put together the right operating
23 procedures and practices and, you know, they
24 assisted with the development of checklists and a
25 whole suite of things.

1 So we augmented our staff with
2 additional subject matter experts to ensure that we
3 made the right decisions and were able to get
4 through the information timely.

5 We knew that a project of this size,
6 you know, time was -- there was going to be a push,
7 there was going to be a time crunch. Every big
8 project there is, and that's why we staffed it
9 accordingly.

10 MS. MCGRANN: With respect to the
11 information that you needed from RTG and its
12 subsidiaries, were there any particular topics or
13 areas of information that you didn't receive in a
14 timely fashion that did impact your ability to
15 prepare for operations?

16 MR. CHARTER: Not beyond what I've
17 already described. I mean, you know, I know that
18 there was delays in getting the training material,
19 the training information, but, you know, that was
20 all managed and mitigated and dealt with
21 appropriately.

22 So, you know, I come back to, you know,
23 we know that there was a time crunch and a lot of
24 information in short periods of time, but yeah, you
25 know, we had the right resources and people to be

1 able to manage that, so I can't think of anything
2 specific.

3 MS. MCGRANN: With respect to the
4 training material and the training information, did
5 the timing of delivery of that material or the
6 material that was delivered when you received it
7 result in any change to the training period or the
8 approach to training that you had planned to take
9 with your members of staff?

10 MR. CHARTER: No, it did not. I know
11 that our training unit took more of a hands-on
12 approach to take the information from RTG and put
13 it into a format that was more accustomed to OC
14 Transpo, but that was really about formatting and
15 best practices and training, but it wasn't changing
16 the content by any means.

17 So no, it didn't change our approach
18 and it didn't change a period of time that we
19 provided training for our staff or anything like
20 that.

21 MS. MCGRANN: Who, if anyone, from RTG
22 was involved in developing the training approach
23 that OC Transpo took to its staff that would be
24 involved in operating the system?

25 MR. CHARTER: You know, the players did

1 change on the RTG side while -- you know, during
2 the construction. So, you know, I mentioned
3 Mr. Matthew Slade is the director, you know, but I
4 know he wasn't there from the beginning of the
5 project, so I'm just trying to think of the name of
6 who have might have been more involved at the
7 beginning, but I'll have to defer to Matthew Slade
8 as the overall project director.

9 I know he wasn't the project director
10 at the commencement of the project, so name escapes
11 me at this time.

12 MS. MCGRANN: You referred to subject
13 matter experts and you named a number of different
14 locations. I couldn't tell if those were locations
15 where the subject matter experts resided and came
16 from or if those were locations of projects that
17 they had prior experience on. Can you help me out
18 with that a little bit?

19 MR. CHARTER: Sure. So the subject
20 matter experts we employed, they came from a
21 consulting organization, you know, that were formed
22 for the Capital Transit Partners, but we involved
23 people that had experience in Dallas, you know,
24 with their DART line. We involved an expert who
25 had experience with the Hudson Bergenline as well

1 as a line in St. Louis. We also had another expert
2 that had worked many, many years, you know, with
3 Boston, the MBTA.

4 And then, you know, additionally,
5 during the lead up towards launch, myself and
6 members of our staff were able to visit other
7 properties and, you know, learn from what other
8 properties have done. So, for example, we did go
9 to -- we did visit Dallas and we saw how they
10 managed major events. We went to Philadelphia and
11 they have very multi model -- very large multi
12 model control centre SEPTA, and we went and spoke
13 to representatives there.

14 So we leveraged the time to reach out
15 to the industry experts as well as utilize the
16 consultants that were working with us. And there
17 was a number of times as well where we did, you
18 know, a group of City staff reached out to other
19 properties to get, you know, what's your best
20 practice on certain things like bike usage on
21 trains or simple things like, you know, do you
22 allow food on a train so to speak. We'd reach out
23 to comparative properties, Toronto, Calgary,
24 Boston. We got a lot of feedback from some of our
25 partners in that regard as well.

1 MS. MCGRANN: A couple of followup
2 questions there. You were describing subject
3 matter experts, and we got a bit of an audio
4 cutout. I think you said that they all came to you
5 via Capital Transit Partners; is that right?

6 MR. CHARTER: Yes.

7 MS. MCGRANN: With respect to the
8 projects that you have reached out to to discuss
9 best practices, had you or anybody at OC Transpo
10 taken a look to determine whether there were
11 services or lines already in operation that would
12 stand as a good example or proxy for what Ottawa is
13 trying to accomplish that you could use as a model
14 for aspects of your approach to operation?

15 MR. CHARTER: Yeah, our departmental
16 leadership team at the time looked at that and
17 that's why we reached out to a cross-function of a
18 property --

19 MS. MCGRANN: I'm just putting my hand
20 up because the audio is once again causing us an
21 issue. So let's just go off the record for a
22 second.

23 -- OFF THE RECORD DISCUSSION --

24 MS. MCGRANN: You had been talking
25 about work that had been done to identify model

1 systems in operation that you could use as
2 reference points for best practices and things.
3 Could you continue with that answer.

4 MR. CHARTER: So we knew -- so our
5 departmental leadership team, you know, we did want
6 to try to learn from other properties as much as
7 possible, you know, but we also knew that our
8 system was not identical to any property that we
9 were aware of. You know, it was a computer-based
10 control system. Low floor vehicles had the ability
11 to go completely driverless if we wanted to but,
12 you know, we decided to have trains on. And, you
13 know, it was going to be a very, very busy line
14 from day one.

15 So, you know, we wanted to -- so what
16 we did was we reached out to a cross-section of
17 organizations both that were experienced in rail
18 operations and then some of them more closely
19 aligned to our type of system. So, you know,
20 Calgary Transit was one of them. Now, you know,
21 they have operators on train, but it's not a fully
22 CT system.

23 You know, Toronto, much larger
24 organization, but, you know, a wealth of
25 information that you can learn from them as well.

1 And then there was, you know, a couple
2 of other properties in the States and Vancouver.
3 You know, Vancouver is completely computer-based
4 train control driverless system. So we knew that
5 there was not going to be one direct comparator, so
6 that's why we reached out to several different
7 properties and we had a diverse skill set and
8 experience set of consultants that were working
9 with us.

10 MS. MCGRANN: With respect to -- I'm
11 going to jump around in the chronology a little bit
12 just as a heads up.

13 With respect to starting up operations,
14 what resources did you have in place to support
15 your employees who were involved in driving the
16 trains and operating the control centre and things
17 like that?

18 MR. CHARTER: Yeah, so we -- you know,
19 once again, the departmental leadership team
20 created a rail activation management program and we
21 also had what we called MMTP, multi model
22 transformation program. So it was a series of --
23 you know, it was 20 some odd identified projects
24 that had a specific project charter, reporting
25 mechanism and dedicated resources to that. So

1 things like opportunities and gaps to trains and
2 systems to contract management. They all had a
3 separate project charter defined scope with
4 resources and, you know, it was all driving
5 towards, you know, day one launch.

6 So that was -- that's the MMTP multi
7 model transformation program. And then as we got
8 closer to launch, we got into more of a formal
9 reporting structure with the rail construction
10 program, senior management, and OLRT or RTG, in
11 which we met frequently, and we called it RAMP, the
12 rail activation management program. So dedicated
13 resources, dedicated project schedule and tracking,
14 and we identified, I don't know the exact number
15 off the top of my head, but it was 20 some odd
16 specific projects that were all designed towards
17 making sure that we were not only ready to run the
18 rail line but also the rail line was going to be
19 integrated into OC Transpo. Because it was going
20 to be a multi model network, our customers were
21 going to be relying on a combination of bus and
22 train. The majority of our customers were going to
23 be going on bus and train, so the rail network
24 couldn't be a standalone entity, it had to be
25 engrained into the OC Transpo.

1 MS. MCGRANN: Okay. This is going to
2 be a rather specific question, but, for example,
3 with respect to the drivers, did you bring in or
4 did you consider bringing in anyone with previous
5 driving experience on a line that was comparable to
6 yours to act as a resource as the drivers get used
7 to driving in active operation?

8 MR. CHARTER: No, I mean we -- we're a
9 unionised workforce here, and we're committed to
10 our union here that all our hires were going to be
11 internal hires where possible. And we were able to
12 do that. We did -- I know that OLRT through their
13 subcontract Alstom, they had dedicated staff to
14 assist with the training, and the initial training
15 and the initial movement of trains. So they
16 assisted our staff in that regard. But no, our
17 staff were primarily going to be and they ended up
18 all being internal hires from within our ranks.

19 MS. MCGRANN: I'm talking about
20 slightly different. Knowing that all of your hires
21 were going to be internal hires, I've seen what
22 I've described -- what I'm talking about described
23 as a shadow operator, but it's basically bringing
24 in a resource with operational experience that's
25 available for the first little while while your

1 drivers are getting used to actually driving in
2 real service just to act as a phone-a-friend kind
3 of situation, call somebody who has seen the
4 situation before, how do I respond to this.
5 Anything like that considered?

6 MR. CHARTER: Well, I know that Alstom,
7 they have their technicians and their support
8 staff, and that was the function that they were to
9 provide for us especially in the early days as well
10 as, you know, when we went into service -- revenue
11 service, or service launch.

12 So no, once again, our staff, it was
13 all OC Transpo staff, but we did have the support
14 from Alstom and, you know, their technicians and
15 their support staff.

16 MS. MCGRANN: And in practice, was the
17 support provided by Alstom and their technicians in
18 the early days of operations successful? Was it
19 useful and efficient and things like that?

20 MR. CHARTER: There were certain areas
21 that functioned really well and other areas which
22 were challenged, and I know we're jumping around a
23 little bit in timeline, but that's where it became
24 -- it became a challenge in that, you know, the
25 number of issues that they needed to provide

1 support on exceeded their ability of the staff that
2 they had on site.

3 MS. MCGRANN: With respect to the
4 operational support that they're providing, just
5 sticking with the drivers and those operating the
6 control centre right now, was it the case that
7 Alstom was not able to respond to all of the
8 requests for support that were coming out of those
9 two areas?

10 MR. CHARTER: Yeah. You know, that's
11 my view. That's one of the challenges that I saw
12 is that, you know, it was a new startup operation
13 with new trains, and the feedback that they at RTG,
14 OLRT, Alstom, you know -- sorry, I keep saying them
15 all interchangeably -- that's feedback that they
16 continued to hear from us that giving a startup
17 operation they should over resource to start and
18 then when things stabilize, then they can go back
19 to normal staffing levels, but, you know, prepare
20 for the unexpected, prepare for what could happen
21 and resource accordingly.

22 So, you know, I think that was a
23 challenge in that we started to experience issues
24 and, you know, if you have staff working on one
25 issue, they can't be working on the next one that's

1 coming up.

2 MS. MCGRANN: At any point did you look
3 at bringing in additional resources on the OC
4 Transpo side to support the requests for help that
5 were coming out of your drivers and the control
6 room operators and things like that?

7 MR. CHARTER: Well, as I said, we had
8 the consultants that we were working with. I know
9 at one point, I don't know exactly when that was,
10 but I know that Mr. Manconi also brought in the
11 independent assessment team, and then we --
12 throughout the maintenance term, there's been times
13 in which we've enacted increased monitoring and
14 oversight as well as the use of other experts to
15 help get to the root cause of issues and ultimately
16 try to get the resolution quicker for our
17 customers.

18 MS. MCGRANN: And I wonder if we're
19 speaking at cross purposes at this point because I
20 really do want to focus on sort of the learning and
21 ramp up period for your drivers and for others
22 involved directly in the operation of the system.

23 So before we go any further, let me
24 just make sure that I have understood your answers
25 properly. When I was asking you about examining

1 the possibility of bringing in a shadow operator or
2 people with experience in actually operating the
3 trains and the control system and things like that
4 to act as a resource for your staff while they are
5 learning their jobs on the job, that portion of it,
6 you mentioned that that resource is being provided
7 by Alstom through its technicians; have I got that
8 right?

9 MR. CHARTER: Yeah, pretty much. We
10 had working with us, and, you know, they worked,
11 you know, pretty much with our front line staff, so
12 for example, one of the consultants was a former
13 driver, not of this specific train or not on this
14 specific system, but had driven trains and worked
15 his way up through the management ranks and was
16 ultimately, you know, the director at the time of
17 the rail line they were operating. So we had
18 people that worked directly with us and part of the
19 front line. They were working with us to create
20 check lists, troubleshooting guides. We have
21 station management playbooks.

22 So, you know, we had some expertise
23 that were helping my staff directly, not just
24 myself but my staff directly, but if the question
25 is is having someone mentor and sit there with a

1 driver, you know, no. You know, it was a
2 train-the-trainer model for the drivers. You know,
3 OLRT, RTG was required to train our staff, our
4 training staff and our training staff then in turn
5 trained our staff and as we got more and more
6 people trained, became more proficient doing things
7 and then, you know, we had sort of our own internal
8 support and mentors supported by Alstom and their
9 particular technicians.

10 MS. MCGRANN: With respect to the train
11 the trainers approach taken, how many trainers did
12 you initially start out with being trained by the
13 private partner?

14 MR. CHARTER: I don't know the number
15 to that. You know, I'd say -- I don't know the
16 number. I'd be guessing.

17 MS. MCGRANN: Do you know --

18 MR. FLEMMING: If I can just jump in.
19 I noticed Peter Wardle dropped off. I wonder if we
20 can take a brief break. I'm sure he'd want to be
21 present.

22 MS. MCGRANN: Of course. We can go off
23 the record.

24 -- OFF THE RECORD DISCUSSION --

25 MS. MCGRANN: We were talking about the

1 training provided to drivers on the system, and you
2 had said that it was a train the trainers program.
3 I had asked you a question about the number of
4 trainers who were originally trained. You didn't
5 remember the exact number. That's no problem.

6 My next question is do you know if any
7 of the trainers who received that original training
8 from representatives of the private partner are
9 still in training roles today?

10 MR. CHARTER: Yes, and I just wanted to
11 clarify a little bit hoping that --

12 MS. MCGRANN: We're going to have to go
13 off the record again.

14 (TECHNICAL DIFFICULTIES)

15 -- OFF THE RECORD DISCUSSION --

16 MS. MCGRANN: So we had been talking
17 about whether any of the trainers who received the
18 original training from representatives of the
19 City's private partner are still in training roles
20 today?

21 MR. CHARTER: Yes. So I believe there
22 are, and I was mentioning, I just wanted to
23 clarify, so, you know, for the operators, the train
24 drivers, it was a train-the-trainer model. For the
25 rail controllers the training was provided by, you

1 know, a contracted firm from it was OLRT, RTG.
2 They were required to provide that training for our
3 controller. So it wasn't -- they weren't a
4 train-the-trainer model. They contracted with the
5 two individuals to provide that training to all the
6 rail controllers, but for our rail operators it was
7 the train-the-trainer model.

8 MS. MCGRANN: Okay. With respect to
9 the drivers, how was training provided as with
10 respect to retrofits that have been made to the
11 train since they went into operation, software
12 updates, and other changes like that?

13 MR. CHARTER: So, you know, we
14 continued to provide training to our operators.
15 There's a number of things that we do. Obviously,
16 there's operational bulletins and memos that are
17 issued to them when those changes may affect what
18 they do. We have refresher training. All our
19 operators go through I believe it's 16 hours a year
20 of refresher training.

21 You know, and then we have staff that,
22 you know, actively on the line or in the operator's
23 common areas that update on information that they
24 require at the time.

25 So we continue communication with our

1 staff through a variety of means and, as I said, we
2 have refresher training programs. We do
3 operational debriefs when there's incidents on the
4 line like a disruption. We want to see if there's
5 lessons learned, what worked well, what didn't.

6 And then as well, we also have drills
7 and exercises that we do to keep people up to speed
8 on their -- on things that they need to know
9 whether it's responding to a lost child, a person
10 on the track, someone uses the emergency telephone.
11 So we do that on a regular basis, and that's
12 something that we have ingrained in our safety
13 management system.

14 MS. MCGRANN: With respect to refresher
15 training, who designs what is provided by way of
16 refresher training?

17 MR. CHARTER: That would be our staff,
18 our OC Transpo staff, our training unit.

19 MS. MCGRANN: And is the private
20 partner involved in any of that refresher training
21 design?

22 MR. CHARTER: Well, they're the ones
23 that would be providing us the information. You
24 know, whether it's a change in how the CBTC system
25 works or change in train functionality, they would

1 be providing that information and then we would be
2 incorporating that into our training material or
3 updates.

4 MS. MCGRANN: Do they then review the
5 training material that you've developed based on
6 the information they provided to ensure that
7 everything has been captured accurately?

8 MR. CHARTER: It depends on the
9 circumstances. Potentially, but not all times, no.

10 MS. MCGRANN: You mentioned operational
11 debriefs. By "you" I mean for this question I mean
12 OC Transpo, did OC Transpo run debriefs in respect
13 of the two derailments on the line in August and
14 September of 2021?

15 MR. CHARTER: Those ones are a little
16 different. I mean obviously they're very, very
17 detailed investigations into what happened, so
18 we've collected information from our operator, you
19 know, and then obviously Alstom, RTG has collected
20 information, so these are slightly different
21 because those are detailed investigations.

22 The debriefs are more focussed on like
23 we had a defect on the line, and the train was
24 immobilised for an hour. What did we do to get it
25 off, what worked, what didn't. Those are where we

1 focus most of our debriefs.

2 The derailments were detailed
3 investigations of what happened, and, you know,
4 what's the root cause to -- what's the root cause,
5 what happened, and what can be done to prevent it
6 in the future and what mitigations need to be put
7 in place as we're investigating the final root
8 cause.

9 MS. MCGRANN: Okay, so looking at the
10 operational debriefs on non-derailment issues
11 experienced on the system, are there any sort of
12 ongoing measurements that you keep track of that
13 sort of track your staff's response to instances?
14 And I'll give you an example of what I mean. For
15 example, the time it takes to identify that a train
16 needs to be taken off the active line and then the
17 time taken to remove the train, any sort of ongoing
18 monitoring or tracking of reactions like that?

19 MR. CHARTER: So we don't have a formal
20 metric or formal tracking in that regard. Right
21 now we really are focussed on, you know, what was
22 the response and how did we respond, but, you know,
23 the incidents really do vary, and we want to get to
24 a point with our maintainer which regardless of
25 what occurs, aside from a major issue like a

1 derailment, regardless of what occurs the train is
2 moved off the line as quickly as possible. That's
3 the goal. But depending on what the circumstance
4 is, you know, getting that train off the line may
5 be, you know, 15 minutes because it was a simple --
6 it was a reset that a technician needed to do or it
7 could have been something more -- takes a longer
8 time i.e. a technician needs to get outside the
9 vehicle and release the brakes manually in order to
10 get that train to move.

11 So we're not at that point where we're
12 standardizing what that response is. We just know
13 that the number of occurrences is still too high,
14 and we're looking to see that, you know, the length
15 of time to recover is reducing.

16 MS. MCGRANN: And I understand the part
17 of your answer that looks to the maintainer and
18 what they're doing. I would like to understand
19 what step OC Transpo is taking to understand its
20 own staff's reactions to incidents and where there
21 may be room for improvement, where things are going
22 very, very well, where there may be lessons
23 learned.

24 So how are OC Transpo's operational
25 staff assessed in terms of their responses to

1 incidents that occur on the line?

2 MR. CHARTER: So when we look -- when
3 we do an operational debrief, we look at what was
4 the role of our staff at the time. Recognizing
5 that, you know, our staff on that train and our
6 supervisors that are out on the line have a very
7 limited role in the rectification of the issue,
8 right.

9 There's a certain number of functions
10 that we've been authorized by RTG and Alstom to be
11 able to perform, some resets of certain systems or,
12 you know, isolating a door. Isolating a door
13 means, you know, there's some reason that a door
14 won't close properly. And isolating it is allowing
15 the operator to close the door, take that door out
16 of service but keep the train in service, right.

17 So when we look at both, the number of
18 things that our operators can do are very minimal,
19 but we do look at that. So we look at, you know,
20 if it is a door issue, how quickly we were able to
21 respond and react and, you know, there have been
22 occurrences where the operator wasn't able to
23 isolate the door and it turned out to be an
24 operator error. You know, but those are very few
25 and far between.

1 The majority of the incidents we
2 require an Alstom technician or someone to attend
3 to the train similar to a car, plug in their
4 laptop, find out what's wrong, and take the
5 necessary steps. But there's only a small number
6 of situations in which our operators have the
7 technical expertise and authorization to take
8 corrective action to keep the train moving.

9 MS. MCGRANN: And with respect to the
10 areas in which your operators do have the ability
11 to address the issues, are the assessments of their
12 performance of those duties collected in a
13 particular file? How are they organized such that
14 you can assess and learn from --

15 MR. CHARTER: So for the operational
16 debriefs, you know, we have -- we have a list of
17 action items that come out of it. You know,
18 whether it's an RTM action item or whether it's an
19 OC Transpo action item, sometimes it's retained for
20 staff, sometimes it could be notification to all
21 staff a reminder, you know, and other times it's,
22 you know, the recommendations, the issues are
23 related to RTG or Alstom.

24 MS. MCGRANN: And the debriefs that you
25 do of these incidents, are they done by OC Transpo

1 only or are they done in collaboration with
2 representatives from the private partner?

3 MR. CHARTER: We organize them and we
4 invite RTM to participate. They do participate, I
5 won't say in every single one, but they do
6 participate in the majority of them, and they are
7 invited to participate because they're a key
8 partner.

9 MS. MCGRANN: And if you could describe
10 the debriefs as a whole since the start of public
11 service through to now in terms of the quality of
12 partnership and the benefits that come from having
13 representatives of the partner at those meetings,
14 has it been good across the board? Have there been
15 changes? Like, how would you describe the ark of
16 that experience?

17 MR. CHARTER: I use the term
18 "refinement". You know, the early days, you know,
19 we weren't focussed so much in doing these
20 operational debriefs. It was what was the issue
21 and what's being done to rectify it. But as we got
22 more into the day-to-day operations and, you know,
23 there's a rhythm to a day-to-day operation, right.
24 But as we got into that rhythm, we were able to
25 implement these operational debriefs and just got

1 better at documentation, better at, you know, the
2 process more timely, those types of things.

3 So it starts off with the first step is
4 usually almost always hold the radio transcripts.
5 What was the dialogue? What was said? Who said
6 what? You know, that gives you those radio
7 transcripts give you the timeline of the events and
8 then that gives you the opportunity to say here's
9 the initial information, send it out to the
10 parties. They can read it in advance and then come
11 together for a bit of a discussion, what worked,
12 what didn't.

13 So we've been able to refine that
14 process, and, you know, it's improved. It
15 definitely has improved. I think all the parties
16 are seeing that there's a legitimate value in doing
17 these debriefs and, you know, I think it's a good
18 example of how, you know, we do have a good
19 partnership in certain aspects with RTM and they've
20 been active participants, and, you know, they take
21 the feedback, and we do in kind as well.

22 MS. MCGRANN: And the refinement that
23 you've seen in the operational debriefs, have you
24 seen the benefits of that play out in the operation
25 of the system? Like, are the lesson learned

1 trickling down into the actual operation? Are you
2 seeing benefits there as well?

3 MR. CHARTER: Yeah. You know, very --
4 at a very high level, you know, although we are
5 where we are, and I don't say that tongue in cheek.
6 I don't tend to be loose about it, but, you know,
7 we are seeing improvements in the reliability of
8 the system. We're seeing a reduction in the number
9 of issues that occur.

10 And generally speaking, you know, the
11 frequency, the magnitude, or the length of those
12 issues, you know, are becoming shorter in duration.
13 Unfortunately, they're all overshadowed, and
14 rightfully so, by the two derailments. Those are
15 major issues.

16 So I appreciate that when I say things
17 are getting better from a reliability perspective,
18 not everyone will believe that because of those two
19 derailments, but I think time will show that things
20 are improving.

21 MS. MCGRANN: With respect to the
22 derailments, you said that the investigations
23 following those two incidents were different than
24 the operational debriefs that are conducted
25 following the incidents that we've already

1 discussed. Can you describe for me what the
2 investigation looked like with respect to the
3 actions and decisions of the drivers of those two
4 trains?

5 MR. CHARTER: Not sure if I follow the
6 question, to be honest, sorry.

7 MS. MCGRANN: Let me break it down. So
8 for the first derailment in August, what steps were
9 taken by OC Transpo or others at the City to
10 understand from the driver's perspective what
11 happened before, during, and after the derailment?

12 I'm just going to pause for a second
13 because -- can we go off the record.

14 -- OFF THE RECORD DISCUSSION --

15 MS. MCGRANN: So before we took that
16 little break, I think I had asked you with respect
17 to the first derailment in August, and the
18 investigation that was conducted following that
19 derailment, what steps did OC Transpo or the City
20 more generally take to understand the driver's
21 experience and actions before, during, and after
22 the derailments?

23 MR. CHARTER: Whenever we have an
24 occurrence like that we get a driver's -- so we get
25 a written statement from the driver, and we'll have

1 a verbal conversation with him as well as look at
2 the video transcripts, and we can flag things in
3 our system, so to keep camera footage and to keep
4 audio footage, so we would have done that until we
5 did that review and that became part of the
6 investigation to, you know -- so we know what the
7 driver experienced leading into the station and
8 then what the driver experienced upon exit, you
9 know, and ultimately when the derailment was, and
10 then RTG and RTM, they're pulling information from
11 their technicians that attended to the scene and
12 that sort of thing. So that's all part of the
13 initial, preliminary information gathered, you
14 know, at the derailment site at the time.

15 MS. MCGRANN: And then a similar
16 question for others on City staff who were involved
17 in the actual operations of the train, what steps
18 were taken to understand their experience in that
19 derailment?

20 MR. CHARTER: So yeah, we would have
21 been collecting information from, you know, anyone
22 who was on site or anyone who was near or would
23 know anything about that train. So that would
24 include our rail controllers, our rail operators,
25 and, you know, if there was a supervisor nearby and

1 what their role, what their action was. So, you
2 know, I know in the August derailment, you know,
3 specifically a few of us went specific to the
4 scene. Myself, the chief safety officer at the
5 time was there, we also had a supervisor, you know.
6 So we're part of that initial preliminary
7 investigation as to what's happening.

8 But we would collect information from
9 any staff who had knowledge or relevant -- or any
10 staff who had any sort of interaction with that
11 train or vehicle or any relevant information.

12 MS. MCGRANN: Any changes made to
13 operating procedures or the way that the City staff
14 would have been doing their jobs as a result of the
15 first derailment?

16 MR. CHARTER: No.

17 MS. MCGRANN: With respect to the
18 second derailment and the investigation taken
19 following that incident, what steps were taken to
20 understand the experience and what was observed by
21 and done by the City operational staff following
22 that derailment?

23 MR. CHARTER: The same thing. You
24 know, collected operator statement, look at any
25 sort of video footage, make sure that we earmarked

1 it or flagged it so it doesn't get deleted every --
2 the information is only retained for so long unless
3 you flag the information. The radio logs, same
4 process -- would have followed the same process.

5 MS. MCGRANN: And any changes made to
6 operations, any retraining, further training or
7 anything like that implemented following the second
8 derailment?

9 MR. CHARTER: No.

10 MS. MCGRANN: I'm going to bounce back
11 to the beginning of 2019 now. And what I'd like to
12 know is from your perspective, what was the City
13 doing by way of oversight of the preparation of the
14 system for substantial completion and then revenue
15 service availability starting at the beginning of
16 2019?

17 MR. CHARTER: So, you know, I wasn't --
18 I was part of the departmental leadership team that
19 we anticipated -- you know, you heard me reference
20 RAMP meetings earlier. So I participated in those.
21 I wasn't directly involved in the oversight of the
22 discussion, but my colleague Mr. Michael Morgan.

23 MS. MCGRANN: I'm just looking over to
24 our court reporter to check the quality of the
25 audio.

1 (ADJOURNMENT)

2 MS. MCGRANN: Before the last break we
3 took, I was asking you about what the City was
4 doing to oversee RTG's work in early 2019. You had
5 mentioned RAMP and you had mentioned your colleague
6 Mr. Morgan. Did you want to finish the answer you
7 were giving?

8 MR. CHARTER: Sure, that would be
9 great. So as I said, we did activate what we
10 called RAMP, the rail activation management
11 program, and, you know, literally we commandeered
12 one of our large boardrooms here and we put up on
13 various boards that track the status of completion
14 of the project. It could be the guideway, the
15 track, the vehicles, safety certification, all the
16 major elements that were required in order to
17 launch service. And then there was, you know, we
18 had monthly meetings, and as we got closer to the
19 launch, those meetings became closer and closer to
20 biweekly to weekly to daily.

21 So, you know, that was my involvement
22 from a departmental leadership team perspective.
23 But as I mentioned. My colleague Michael Morgan
24 from the rail implementation office construction
25 program or rail construction office, their role was

1 the one that was ultimately -- they were overseeing
2 the construction and all the work towards the
3 completion and provided that -- you know, provided
4 the documentation that supported that they'd
5 achieved substantial completion, which ultimately
6 came from RTG.

7 MS. MCGRANN: Who else was a member of
8 RAMP?

9 MR. CHARTER: So, you know, Mr. John
10 Manconi, the general manager at the time. You
11 know, Jocelyn Begin and then all the directors, so
12 myself, my colleague Pat Scrimgeour, Michael
13 Morgan, Kim McEwan, I believe, the chief safety
14 officer at the time Jim Hopkins. Essentially the
15 OC Transpo departmental leadership team.

16 MS. MCGRANN: So when you say all the
17 directors, are you referring to all the --

18 MR. CHARTER: I said OC Transpo.
19 Actually, at the time it was Transportation
20 Services, which included the rail construction
21 office.

22 MS. MCGRANN: Okay. Is the rail
23 construction office the same as the rail
24 implementation office or are those two different
25 organizations?

1 MR. CHARTER: The same. The acronym,
2 the title has changed.

3 MS. MCGRANN: And what were the sources
4 of information provided to RAMP about how RTG was
5 progressing as it worked towards substantial
6 completion and revenue service availability?

7 MR. CHARTER: Well, the RAMP meetings,
8 you know, it was a joint meeting which we had RTG,
9 OLRT participate in those meetings. You know, and
10 the information that was being supplied that
11 informed the status of each one of the major
12 elements was coming from RTG, OLRT to the various
13 groups within the rail implementation office, which
14 then was presented at these sessions.

15 MS. MCGRANN: So it sounds to me like
16 the members of RAMP were getting information about
17 the progress on the RTG side from two sources; one
18 it's coming to I'll call it indirectly through the
19 rail implementation office as reported up and then
20 two, it's being reported to you directly by
21 representatives of RTG and OLRTC who attend the
22 RAMP meetings; is that correct?

23 MR. CHARTER: Yeah, I mean it's -- you
24 know, any information that was being presented
25 directly to the rail implementation office that

1 came to RAMP, it came from RTG. So there was no
2 surprises with regards to the information they were
3 supplying was the information that DLT was speaking
4 to.

5 MS. MCGRANN: Was the City receiving
6 reliability reports directly from Alstom as well?

7 MR. CHARTER: You know, you'd have to
8 ask my colleague Michael Morgan on that. We would
9 have been getting whatever information through OLRT
10 being through OLRT, RTG being the main constructor.

11 MS. MCGRANN: It's OLRTC, am I right?

12 MR. CHARTER: They were the
13 construction side of things. The City's contract
14 is with RTG but OLRT was the constructor.

15 MS. MCGRANN: And through the meetings,
16 let's call them January and February of 2019, the
17 RAMP meetings and otherwise, what information were
18 you receiving about the reliability of the trains
19 and how they were fairing in the work that RTG was
20 doing?

21 MR. CHARTER: I mean there were some
22 reliability challenges with the vehicles as well
23 as, you know, getting all 34 vehicles ready for
24 service was -- I know that was also one of the
25 factors that caused the delay in the launch was the

1 availability of 34 vehicles for service.

2 MS. MCGRANN: Let's start with the
3 reliability challenges. What did you understand
4 the reliability challenges to be in January and
5 February of 2019?

6 MR. CHARTER: You know, I don't know if
7 they're specific to January or February, but I know
8 some of the reliability challenges with regards to
9 the train line communications, the -- you know, and
10 then as well as how the trains interacted with the
11 computer-based training control system. You know,
12 that's my recollection.

13 I know there was more other sort of
14 other elements to it. I think there was, you
15 know -- because we did see it for a period of time
16 a large number of fault codes on vehicles that
17 prevented them from launching. They needed to be
18 worked on or the codes needed to be cleared prior
19 to them going from the maintenance storage facility
20 out on the main line, but those are some of the
21 main issues where, you know, various fault codes as
22 well as some train line communications and how they
23 interacted with the computer-based training control
24 system.

25 MS. MCGRANN: The fault codes that you

1 mentioned, were they only a factor in getting the
2 trains out of the maintenance facility or were they
3 also affecting trains on the line?

4 MR. CHARTER: They affected trains on
5 the line, but what we saw was, you know, the trains
6 would operate and then they'd go back to the
7 maintenance storage facility and then the next day
8 when the trains needed to be launched, these fault
9 codes or failure codes would populate, you know, at
10 that launch period in the morning.

11 So it seemed once you were able to get
12 them cleared, you saw some improved performance out
13 of them, but it could resurface and, you know, it
14 did for a period of time.

15 MS. MCGRANN: Did you receive
16 information from RTG, OLRTC, or anyone working for
17 those entities about the potential causes of the
18 issues that you were seeing in the early part of
19 2019?

20 MR. CHARTER: I know that there was
21 lots of discussion back and forth on that and, you
22 know, there's some formal letters that were issued
23 from the rail construction program or the rail
24 implementation office talking about, you know, the
25 issues that were experienced and, you know, that

1 formed part of our rationale as to why the initial
2 revenue service availability dates weren't going to
3 be met.

4 Those were our concerns that, you know,
5 that RTG, OLRT were adamant that at certain times
6 they had met the requirements for revenue service
7 availability and then I know the City had responded
8 back, and my colleague Michael Morgan responded
9 back with, here's a listing of all the issues that
10 we're experiencing, and this is what is informing
11 the City's opinion as to why it has not been
12 achieved.

13 MR. WARDLE: Just for the record, I
14 think the witness is referring to substantial
15 completion rather than revenue service
16 availability.

17 MR. CHARTER: That's correct. Sorry,
18 Peter. Thank you.

19 MS. MCGRANN: Before I move on from the
20 early months of 2019, so information is being
21 delivered by RIO, you're hearing information
22 directly from RTG and its subsidiary entries at the
23 RAMP meetings. What about the independent advisory
24 team that was comprised of members of CTP? Do you
25 know the group that I'm referring to there?

1 MR. CHARTER: Yes, I do.

2 MS. MCGRANN: What work were they doing
3 at this time with respect to the progress of the
4 system?

5 MR. CHARTER: So the independent
6 advisory team, I believe, and I'm going by a bit of
7 a recollection here, my memory, I believe they were
8 brought on post launch. But they were, you know,
9 largely the same members that we included and were
10 involved in all the activities leading up to
11 launch. So I think that term independent
12 assessment team came up a little later. I'm going
13 by my memory on this one, so I may be off on the
14 dates a little bit, but we involved these experts,
15 the subject matter experts, these industry experts,
16 we involved them, as I mentioned earlier, all the
17 way up to launch, and, you know, they were helping
18 to inform the City of the concerns with regards to
19 things like, you know, the stagger and the catenary
20 system was implemented. You know, the reliability
21 challenges with some of the vehicles.

22 So they were helping the City and
23 assisting the City in making its determination as
24 to whether or not the system was ready to launch.

25 MS. MCGRANN: You said the stagger.

1 What is that?

2 MR. CHARTER: So, you know, our
3 system -- you know, the trains, they get their
4 power from an overhead catenary system. Unlike the
5 system like in Vancouver where they have their
6 power line is beside the train not overhead, so the
7 trains collect power from the power wire and, you
8 know, where the train interacts with the power wire
9 is what we call a pantograph. So that's the -- you
10 know, you probably see that in Toronto or in other
11 places.

12 You know, there's an arm that comes up
13 from the train that interacts with the wire and if
14 that wire was perfectly straight from end to end,
15 what you'd see is this pantograph, which has got a
16 carbon strip along the length of it would have a
17 groove. And what you want to see is you don't want
18 to see grooves. You want to see even wear across
19 the entire pantograph head, right.

20 So you want to have a stagger in your
21 overhead power line. You don't want the overhead
22 power line to be straight because then that power
23 line would only be interacting with one part of the
24 pantograph. So if you stagger it, you know, you're
25 getting even wear across the entire carbon strip on

1 this pantograph.

2 MS. MCGRANN: Is that important for a
3 lifecycle of the components? Is it important for
4 reliability of service, both?

5 MR. CHARTER: Both. I mean definitely
6 it results in increased wear and tear on the
7 pantographs, an increased need to change them out
8 and, you know, it can result in other issues, other
9 disruptions. So it is something that you need to
10 be concerned with for sure. You know, it's not
11 just a maintenance perspective. It is -- there's a
12 reliability element to it as well.

13 So that's just an example of one of the
14 things that the feedback we were getting from the
15 experts that we were utilizing.

16 MS. MCGRANN: The experts that you were
17 utilizing, how were they positioned at the City at
18 this point in time? By that I mean were they
19 sitting on a committee on their own and providing
20 advice? Were they embedded within working groups
21 and committees at the City?

22 MR. CHARTER: There were -- it really
23 was a combination. You know, I know Michael Morgan
24 in his office he had a number of consultant and
25 experts that were helping to inform and assess, and

1 then we had a number of -- some of these people
2 were involved in some of the working groups and the
3 committees. Then as well, they were actively
4 involved in those RAMP meetings that I talked
5 about. You know, and they were providing advice
6 and guidance directly to the general manager as
7 well as to the management team.

8 I worked with a few of them directly on
9 preparing for the operations. I mentioned earlier,
10 you know, the writing of the SOP's. We created --
11 I mentioned station management playbooks, how we're
12 going to manage various events at different
13 stations taking into consideration emergency egress
14 routes, volume of passengers anticipated at
15 stations, those types of things. So they were
16 embedded in the organization both within OC Transpo
17 and the rail placement office. They were active
18 participants in some working groups. As well, they
19 were active -- certain members were active at the
20 RAMP meetings.

21 MS. MCGRANN: Focussing specifically on
22 the activities undertaken to understand the
23 readiness and the reliability of the vehicles for
24 service, which consultants were engaged in that
25 work?

1 MR. CHARTER: So I said -- I know there
2 will be a longer list that Michael will be able to
3 provide, but, you know, from my awareness, there
4 was Brian Dwyer, Joe North, Larry Gall (phonetic)
5 who I worked very, very -- Tom Prendergast is
6 brought in at some point as well, so those are the
7 one's that I was primarily familiar with, but I
8 know Michael has got a much longer list of people
9 that were supporting his day-to-day activities in
10 the construction side of things.

11 MS. MCGRANN: You mentioned stagger
12 specifically when talking about issues that had
13 come up with the trains. Was that presenting a
14 issue or set of issues for the trains in early
15 2019?

16 MR. CHARTER: I don't think it was
17 causing any specific issue, but there was a concern
18 that it, you know, could result in disruptions as
19 well as increased maintenance activity. So it was
20 highlighted as a potential issue.

21 MS. MCGRANN: With respect to the
22 actual issues that you were aware of and that the
23 City was aware of, you mentioned train line
24 communications. You mentioned issues or
25 interactions with the CBTC system. You mentioned

1 the fault codes and the failure codes that were
2 coming up on a daily basis. Any other major issues
3 or categories of issues that you were aware of in
4 early 2019?

5 MR. CHARTER: I know that, you know, as
6 well reported that in one of the weather events
7 prior to launch, switches and switch heaters were a
8 concern. You know, we had multiple switches that
9 were going disturbed. You know, and it's a
10 combination of the switch itself as well as the
11 heater that prevents the ice and snow from build up
12 within that switch mechanism. That was a concern,
13 and that continued into service launch as well.

14 You know, I know a lot of it was about
15 train reliability. You know, that was the earlier
16 issue, but the other one that really pops up in my
17 head right now is the switches and switch heaters.

18 MS. MCGRANN: And as you move into the
19 spring and summer of 2019, how was the system and
20 the trains performing as you move through that
21 period of time?

22 MR. CHARTER: So, you know, we do see
23 an improvement in the functionality of the trains.
24 You know, and then we're having that ongoing
25 dialogue with them about the updates they're making

1 to, you know, the software for the train control
2 system, the updates for the CBTC system, and we do
3 see improvements in the reliability of both the
4 trains and the system itself.

5 Obviously, certain things like, you
6 know, switches and switch heaters they're not as
7 challenged as much in the summer as they are in the
8 winter, but we weren't seeing -- we weren't seeing
9 impacts with the infrastructure at that time.

10 MS. MCGRANN: When you say you weren't
11 seeing impacts with the infrastructure at that
12 time, what do you mean?

13 MR. CHARTER: So, you know, switches,
14 at either end of our line, you know, trains do need
15 to switch from one track to another, so they're --
16 we're doing 500 trips a day, you know, so those
17 switches are continually being used, and we saw
18 good reliability out of them but, ultimately, the
19 real test comes in the winter months.

20 They made some modifications to the
21 functionality of those switch heaters, which was
22 thought to -- would result in benefits in the
23 winter months, but during the summer months, we
24 weren't seeing any sort of high level frequency or
25 issues with regards to the performance of the

1 switches, so that's what I meant.

2 MS. MCGRANN: Okay. Before I ask you
3 some more questions about the system and shape
4 performance in spring and summer 2019, I'm just
5 going to pause there for a second and ask you, what
6 was OC Transpo's role in the rolling stock,
7 commissioning, testing, and integration?

8 MR. CHARTER: We're the operator of the
9 trains, so it's OC Transpo drivers driving the
10 trains during those periods of time.

11 MS. MCGRANN: This is prior to
12 substantial completion and revenue service
13 availability?

14 MR. CHARTER: Correct. It was -- aside
15 from the very early days, very initial moves, most
16 of the train movements out onto the main line, not
17 within the yard, but out on the main line where
18 we're ultimately picking up customers were
19 performed by OC Transpo staff.

20 MS. MCGRANN: So OC Transpo's role in
21 the rolling stock, commissioning, testing, and
22 integration is that their drivers are driving the
23 trains?

24 MR. CHARTER: Our drivers are driving
25 the trains, and our controllers are controlling the

1 -- using the CBTC system to control the train
2 movements because it is a computer-based training
3 control system.

4 MS. MCGRANN: And were those people
5 also providing feedback on what they were seeing
6 from their perspective as drivers, controllers, et
7 cetera to RTG or otherwise to assist in the
8 testing, commissioning, and integration?

9 MR. CHARTER: Yeah, I mean -- yes.
10 They would have been actively engaged and involved,
11 you know, ongoing discussions and dialogue,
12 technicians on and off trains when there was a
13 fault. You know, obviously Alstom is reaching out
14 to them and speaking to them as what they
15 experienced, what they heard. You know, you'd be
16 troubleshooting vehicles and trains in which Alstom
17 would go out with our drivers or they would be in
18 our control room speaking to our controller. So
19 they were actively engaged throughout.

20 MS. MCGRANN: And how did you
21 understand that joint effort to be going, the
22 cooperation between OC Transpo staff and those on
23 RTG's side with respect to the testing and
24 integration?

25 MR. CHARTER: I think in an operational

1 level there was good cooperation and good
2 information sharing, and the teams work well
3 together. I think there was -- I don't recall any
4 issues in that regard. I think it was good
5 cooperation at that level.

6 MS. MCGRANN: And how was OC Transpo's
7 role in that testing and integration, I want to say
8 captured from an agreement perspective? Was their
9 role covered in the project agreement? Was it the
10 subject of a separate memorandum of understanding
11 covering their work within the testing,
12 commissioning, and integration phase?

13 MR. CHARTER: I believe in the project
14 agreement there was a requirement for us to provide
15 the drivers and the controllers, but beyond that, I
16 don't think there was anything specific that
17 identified what our specific role would be. But,
18 you know, they knew and we knew we were going to be
19 a valuable source of information as to how things
20 were progressing and what we were experiencing,
21 but, you know, it's not like we were taking the
22 trains out on our own and driving them alone on the
23 line. We had -- there was always technicians and,
24 you know, whether it be Talus who was responsible
25 for the CBTC system, it was always representatives

1 around that were working with us troubleshooting
2 issues, updating software, observing, you know --
3 there's different processes depending on what the
4 system is. So, for example, Talus, the maker of
5 the computer-based training control system, they
6 have very rigid process to ensure safety and, you
7 know, they will -- they have a series of steps they
8 need to pass with their software before putting it
9 into -- onto a vehicle. And they put it onto a
10 vehicle with technicians for a period of time, you
11 know, a defined period of time, say two days, then
12 they take that software back, they analyse it back
13 in Toronto, and once it's gone through all their
14 various tests then they would role it out to the
15 rest of the fleet.

16 So there's always that process back and
17 forth and obviously depending on what system it
18 was, you'd follow different sort of steps.

19 MS. MCGRANN: And could you see was
20 there any compression of the commissioning and
21 testing for the trains from what was originally
22 envisioned to what was actually done?

23 MR. CHARTER: You know, my opinion on
24 it, no. You know, given that there was a delay of,
25 you know, a little over a year, those trains were

1 going through a testing commissioning process that
2 was longer than anticipated. So, you know, that's
3 my opinion on it.

4 I don't think there was any compression
5 in that regard. I mean, although we didn't have
6 the full 34 vehicles at the earlier days, we did
7 have vehicles and we were able to operate across
8 the line.

9 But major projects like this, as I
10 mentioned earlier, you do get into time crunches
11 here and there, but I don't recall that being an
12 issue.

13 MS. MCGRANN: And I know you spoke to
14 the timeline and said that as a result of the
15 delay -- I think I've got this right -- the testing
16 and commissioning period was longer than originally
17 envisioned; is that correct?

18 MR. CHARTER: Yeah, it was. It was. I
19 mean, just by the nature of the delay. I mean,
20 originally I think it was May 2018, and we didn't
21 launch until September 2019. So just by that
22 nature alone, there was more time driving trains,
23 more time for our staff to become experienced in
24 driving the trains, and more of an opportunity to
25 develop troubleshooting materials and those types

1 of things.

2 MS. MCGRANN: I understand that the
3 trains were being or subject to retrofits
4 throughout the testing and commissioning phase
5 through substantial completion, revenue service
6 availability, and into public service; is that
7 right?

8 MR. CHARTER: That's correct.

9 MS. MCGRANN: Do you know if it was the
10 intention at the outset to have ongoing retrofits
11 of the trains through all of those stages?

12 MR. CHARTER: I don't know if that was
13 the overall intention but I do know in speaking
14 with other properties that, you know, you're always
15 making adjustments to software, or there's always
16 -- might be you uncover an issue that wasn't
17 anticipated in there as a retrofit, so I don't know
18 if it was necessarily outlined in any sort of
19 document, but I think there is always an
20 understanding anticipation that when you're
21 managing any sort of fleet, whether it be bus or
22 train, that there will be a degree of retrofits and
23 updates that need to happen over the life of the
24 vehicle.

25 MS. MCGRANN: So based on the

1 conversations you had with some reference projects,
2 representatives, you understood that a certain
3 amount of retrofitting would be normal, of course?

4 MR. CHARTER: And you know, based on my
5 experience with our other line when we went with
6 the expanded service for line two or the Trillium
7 Line, there were a number of retrofits we had to do
8 on that vehicle, while it's a smaller fleet and a
9 smaller line, there were a number of retrofits that
10 had to be done there once we got those trains into
11 service.

12 And once again, just speaking with
13 other places, it's not unlike a bus fleet, you get
14 a brand new vehicle and then, you know, there's
15 things that you find out during the lifecycle of
16 the vehicle or there's things that you want to
17 change based upon, you know, its operating
18 performance.

19 MS. MCGRANN: Were you reaching out to
20 these reference partner representatives through the
21 spring and summer of 2019 and saying to them, this
22 is the level of issues we're seeing here, is this
23 normal for this stage of the process we're at?
24 Were you seeking that kind of feedback?

25 MR. CHARTER: Not -- I don't recall in

1 the spring and summer of 2019 reaching out to
2 properties at that time I think most of the work in
3 that regard was done in the lead up to. But once
4 again, you know, we're continuing to work with
5 those consultants and subject matter experts who
6 they, you know, have connections with other
7 properties and have their own, you know, experience
8 from, you know -- they had I think collectively the
9 group that we were working with had over a couple
10 of hundred years worth of experience in the rail
11 industry, so relying on their expertise and
12 knowledge and their connections with other
13 properties as well.

14 MS. MCGRANN: And those subject matter
15 experts are the representatives from Capital
16 Transit Partners?

17 MR. CHARTER: Capital Transit Partners
18 and, you know, as I said, some of the names that I
19 provided like Larry Gall, Brian Dwyer, John North,
20 Tom Prendergast, and as I said, there's a whole
21 probably list of names that Mr. Morgan could
22 provide as well.

23 MS. MCGRANN: Let's look to the summer
24 of 2019, so June, July up to the trial running
25 period. How were the trains performing from a

1 reliability perspective through that phase?

2 MR. CHARTER: Now we're seeing an
3 improved performance in the vehicles for sure. I'm
4 not going to sugarcoat things and say it was
5 perfect, but we were seeing an improved
6 performance. Some of the issues that we
7 experienced earlier, some of the software updates
8 had been done with the train control system and the
9 CBTC. We were seeing those benefits.

10 Still, you know, we were seeing those
11 -- you heard me reference those fault codes earlier
12 and they were tending to populate at launch, that
13 was still occurring. But we were seeing an
14 improved performance of the vehicles as well as the
15 overall system, so how the trains interact with the
16 track and the computer-based training control.

17 So we were seeing improvements and, you
18 know, we were looking at it very positively that
19 things were trending in the right direction.

20 MS. MCGRANN: And I definitely don't
21 want you to sugarcoat it. Tell me about the issues
22 that you were seeing or that were being reported to
23 you in terms of train performance and reliability
24 as you're approaching the trial running period?

25 MR. CHARTER: So we still were dealing

1 with -- I'd have to look at some stats on it to
2 quantify it, but we were still seeing the
3 occurrence from time to time where a train would
4 become immobilised on the line and it took a
5 technician to attend to that train to be able to
6 remove it. We were still seeing those occurrences.

7 It was a variety of issues. But, you
8 know, the frequency of it was decreasing. And, you
9 know, this is where I know some of the
10 conversations that will come up through this
11 inquiry is talk, I've heard the term the bedding in
12 period. So we thought we were getting to that
13 point where the issues that we were going to be
14 experiencing were just normal bedding in of what
15 you'd see in a new system, a new line, you know.

16 And then with a couple more months with
17 the trial running, that, you know, we continue to
18 work through those. RTG would continue to work
19 through those issues and we'd see them reduce
20 further and further. So that's where we thought we
21 were heading at the time.

22 MS. MCGRANN: So you've mentioned
23 ongoing issues with the fault codes. You mentioned
24 trains becoming immobilised on the line and
25 requiring a technician to go and help retrieve the

1 train. Any other reliability issues that you're
2 seeing as you approached what becomes the trial
3 running phase?

4 MR. CHARTER: You know, I'm not
5 touching upon anything to do with stations. I know
6 that there were some, you know, occupancy things
7 that had to be dealt with at the end, but that
8 wouldn't have resulted in any issue that I would
9 have experienced.

10 But no, really it was -- train
11 reliability was probably the primary issue, and as
12 I said earlier, we had some infrastructure issues
13 with the functionality of the switches which with
14 the adjustments there being made, coming out of the
15 winter, we thought that those issues had been
16 resolved.

17 MS. MCGRANN: Just while you're talking
18 about the switches, was any testing done to
19 ascertain whether the fixes would function in the
20 winter as well as the summer?

21 MR. CHARTER: I'm not aware. You'd
22 have to ask my colleague Mr. Morgan on that.

23 MS. MCGRANN: Coming back to the train
24 performance, you haven't raised this, but I'll ask
25 you specifically so we've covered it. We're

1 talking about reliability issues with the trains.
2 Were there any outstanding safety concerns with
3 respect to the trains or the system as in the
4 summer of 2019?

5 MR. CHARTER: Not leading up to the
6 launch. I know earlier in one of the RTG's initial
7 submissions for substantial completion -- thank you
8 Peter for correcting me on that -- for substantial
9 completion, we raised a number of safety concerns,
10 missing documentation, lack of tests, functionality
11 of the emergency telephones and the fire
12 telephones, those types of things, but when we got
13 the -- when we ultimately approved the substantial
14 completion proceeding to trial running, those
15 issues had all been effectively addressed, so no.

16 I know that we had an independent
17 safety certifier as well review all the
18 documentation, provide their opinion, which was,
19 you know, there was nothing preventing moving
20 forward, and then we went through that safety
21 certification process again before launching of
22 service.

23 MS. MCGRANN: So no safety concerns
24 after you cleared the substantial completion
25 milestone, but ongoing reliability concerns. You

1 mentioned the vetting in period and a belief that
2 maybe you were heading into the vetting in period.
3 What is the vetting in period?

4 MR. CHARTER: So, you know, I don't
5 think there's a defined period of time but, you
6 know, whenever you're starting a new operation,
7 especially a new operation of this size, there's an
8 understanding that there will be some early issues
9 that could be attributed to, you know, new
10 vehicles, new track, new systems, and then, you
11 know, issues that you attribute to dealing with a
12 green workforce, a workforce that's more junior and
13 is still learning how to troubleshoot vehicles and
14 systems and those types of things.

15 So we were heading into that period in
16 which, you know, we were going to see some normal
17 types of disruptions that, you know, any rail line
18 or rail operation would experience, you know, upon
19 its initial start up. And then, you know, you
20 would assume that over periods of time that the
21 frequency and the impact of those issues, which
22 should be minor issues, would start to subside.

23 MS. MCGRANN: And what was the basis
24 for the belief that you were heading into the
25 vetting in period and the issues that you were

1 seeing were a normal part of that phase?

2 MR. CHARTER: Well, you know, there
3 were the issues that we were encountering leading
4 into the start of trial running or the substantial
5 completion. You know, the issues with regards to
6 the vehicles were largely addressed through
7 software updates and other mitigations. The issues
8 with regards, as I said, the switches and the
9 switch heaters, there was updates made to those.
10 You know, there was adjustments made to, you know,
11 various types of infrastructure based upon the
12 feedback the City had provided and based on the
13 experience.

14 So, you know, we were seeing an
15 improvement in reliability and the right decisions
16 and the right actions were being taken by the
17 constructor, so that led us to believe that you
18 know what, they've achieved substantial completion,
19 they met those requirements, you know, and then as
20 a result of that, you know, we can move into trial
21 running at that point and assess the system.

22 MS. MCGRANN: I just don't think that
23 quite answers my question which is, you know, why
24 do you form the belief that the issues that you're
25 seeing are part of a normal vetting in period and

1 not representative of reliability issues that maybe
2 require more attention and maybe you're not quite
3 at the vetting in period phase yet?

4 MR. CHARTER: Largely it's as a result
5 of, you know, you're seeing a reduction in the
6 number of issues that were occurring, and, you
7 know, that reduction in issues could be attributed
8 to some of the actions that were taken in terms of
9 the updates to the various systems and software and
10 those types of things.

11 So you're seeing a reduction in those
12 issues and we're seeing an improved performance of
13 the line. The trains are operating for extended
14 periods of time without issue. The frequency of
15 the issues are reducing, and definitely, you know,
16 to what we talked about just earlier, you know,
17 there was no major safety concerns or any safety
18 issues at all, but recognizing that it was a new
19 system with new vehicles and new teams, that there
20 was going to be, you know, a certain number of
21 issues.

22 No system is perfect. You can go to
23 any system in the world and you'll find issues, you
24 know, almost on a daily basis, but no system is
25 perfect especially a new system that was being

1 implemented. So I know that largely my opinion at
2 this point, but that's the rationale that, you
3 know, I was applying going into it and I think, you
4 know, I don't want to speak on behalf of the
5 departmental leadership team as well, but I think
6 they'll echo something similar to that.

7 MS. MCGRANN: So the idea that the
8 issues that you're seeing prior to beginning the
9 trial running are representative of the vetting in
10 period; is that a view that you formed on your own?

11 MR. CHARTER: No, you know, as I
12 mentioned we're, you know -- throughout the entire
13 process, we're working with industry experts who
14 are helping inform the City both the one's that are
15 working directly with the rail implementation
16 office in Michael Morgan's shop as well as those
17 that are working directly with myself in supporting
18 the RAMP program. So, you know, that's the
19 information that they were all being presented and
20 provided the same information at the time we were
21 having those discussions, that dialogue. And, you
22 know, ultimately they supported moving forward at
23 the time and, you know, they were very, very
24 adamant in, you know, impressing upon us don't
25 expect perfection. That you need to anticipate

1 that there will be some issues early on. That's a
2 normal part of the growth curve and just like, you
3 know, engineers will talk to you about, you know,
4 reliability growth curves of any sort of system in
5 a vehicle, you know, you see -- at the early days
6 you can see a higher degree of disruptions or
7 issues and then over time, you see them greatly
8 reduce.

9 So, you know, it wasn't just my sole
10 opinion. I don't think it was the sole opinion of
11 the departmental leadership team. We were getting
12 information from industry experts that were working
13 with us.

14 MS. MCGRANN: I don't want to keep
15 using the vetting in period if there's not a
16 determinative phase or didn't form part of the
17 decision making to proceed. Let me come at it this
18 way: Did the City develop on its own or with the
19 assistance of those advising it a permissible level
20 of service events or reliability issues that it
21 thought it could tolerate in order to move forward
22 into the trial running phase? Like, was there a
23 series of tests or requirements that the City
24 needed to see before it was ready to move into
25 trial running?

1 MR. CHARTER: The City -- we did have
2 as part of our RAMP program, we did have
3 essentially a go, no go list. And it may not be
4 exactly what you're describing there, but it was a
5 list -- I think it was -- I'd have to refer to the
6 document, but it was a list of I think 11 or 12
7 items that if it wasn't complete, we weren't going
8 to proceed into trial running and then ultimately
9 into service completion. So the first no
10 outstanding service concerns or issues, that was
11 one of the ones. 34 vehicles delivered and
12 certified safe for service.

13 You know, so we had that go, no go
14 list, you know, but was there a defined number of
15 occurrences that would be permissible? No, I don't
16 believe we had anything specific to that.

17 MS. MCGRANN: The reliability issues
18 that you continued to see as you move into June and
19 July of 2019, did they engage with the go, no go
20 list? Like, would the fault code recurrences have
21 triggered a no go on the go, no go list?

22 MR. CHARTER: If there were major
23 issues that were preventing say like a large number
24 of vehicles not being able to be launched or major
25 safety issues, those types of things, yeah, it

1 would have fed into it, but, you know, minor
2 issues, issues that could be resolved within the
3 yard before launching of vehicles, you know, that
4 was up to RTM, RTG to maintain.

5 You know, ultimately at the end of the
6 day, there was a substantial completion portion of
7 it but there's also recognition that RTM is the
8 maintainer of the vehicles, maintainer of the
9 track, and they're the ones that are responsible
10 for getting us those trains available and ready
11 every day. So I don't know -- I don't know if I've
12 answered your question, to be honest.

13 MS. MCGRANN: Let's take it from here.
14 So what was the City's view on the reliability of
15 the trains, or what did you understand the
16 reliability issues to be with the trains as you
17 entered the trial running period? What are the
18 challenges for reliability that you're aware of?

19 MR. CHARTER: As I mentioned earlier,
20 we knew that it was still a number of these fault
21 codes that would populate it at the beginning of --
22 at launch when the vehicles were being brought out
23 to -- there's a handover platform and that's when
24 our driver gets on the train, so within the
25 maintenance and storage facility, you know, RTM

1 moves the trains and gets them to the maintenance
2 and service bays. They bring them around to a
3 handover platform, our operator would get on the
4 train and then take it out onto the main line to
5 start service. So there would be a number of
6 issues affecting those vehicles, you know, in that
7 launch sequence in the morning that would cause
8 some delays or prevent some trains from entering
9 service.

10 As I said, we did experience from time
11 to time some immobilised vehicles that on the line
12 required a technician to attend. So, you know,
13 there were some reliability challenges with the
14 vehicles but, you know, at the time there was
15 nothing that anyone foresaw that would be a major
16 impediment to preventing the safe and reliable
17 operation of the service.

18 MS. MCGRANN: The immobilised vehicles,
19 was it one particular trigger that would cause them
20 to become immobilised or was it more than one?

21 MR. CHARTER: Well, you know, what we
22 typically see what it calls obstructed motion, and
23 it's something preventing the train from moving,
24 but it could be a number of factors. Largely it's,
25 you know, a communication issue within the train,

1 but, you know, Alstom and RTM would be better able
2 to speak to the numbers of issues that were
3 occurring and what they were related to, so I tend
4 to just roll it up into there was some early
5 reliability challenges, but we saw a great
6 reduction in those as we got closer and closer to
7 substantial completion and trial running.

8 MS. MCGRANN: So you both see a
9 reduction in those issues, and you see a
10 continuation of those issues, right? Like, they
11 continued to occur. And I'm trying to understand
12 what the City knew about the reliability issues
13 that were present and what was causing them. So I
14 don't expect you to be able to answer for Alstom.
15 I wouldn't ask you to do that. So the fault codes
16 are only an issue at the handover at the
17 maintenance service, at the MSF?

18 MR. CHARTER: As I mentioned earlier,
19 they could happen on the line as well, but it was
20 more of an issue in the maintenance storage
21 facility as it launched in the morning, but they
22 could occur on the line as well.

23 MS. MCGRANN: And were they continuing
24 to occur on the line as you approached the trial
25 running period?

1 MR. CHARTER: You know, at a much
2 reduced frequency. We were seeing good reliable
3 train service. We were able to run extended
4 periods of time incident free. You know, and we're
5 seeing the benefits of the changes they made with
6 regards to the software and those types of updates.
7 You know, we're seeing -- we saw reduction in the
8 number of those issues.

9 MS. MCGRANN: Okay. Just help me
10 understand what happens when a fault code occurs on
11 the train on the line, what's required to overcome
12 that?

13 MR. CHARTER: Well, some minor fault
14 codes that our operators are trained and certified
15 to be able to resolve. It's literally opening up a
16 panel and resetting a breaker or resetting a
17 switch, but there's a very limited number of
18 situations in which we can do that. You know, and
19 that's coming from Alstom and ORT.

20 You know, obviously these are complex
21 systems, complex vehicles. You need to have
22 specific training and know what you're doing to go
23 beyond just the initial troubleshooting.

24 Other issues that may occur require a
25 technician to come in. And I think I mentioned

1 earlier literally, plug in their laptop, conduct a
2 diagnosis and, you know, determine what the root
3 cause of the issue is, and then depending on what
4 that issue was, what actions they need to take in
5 terms of resetting breakers or, you know, manually
6 turning something off and those types of things.
7 So it really does depend on what the issue is, but
8 those ones that our operators can do are generally
9 fairly quick and easy to recover from.

10 The ones that require a technician,
11 obviously there's a little bit more delay because
12 you need a technician to attend the train. They
13 need to diagnosis it and then take the necessary
14 corrective action and then move the train in to a
15 terminus station or off the line.

16 MS. MCGRANN: In the period leading up
17 to the trial running, I understand that you're
18 seeing these fault codes occur less, but are you
19 still seeing fault codes occur with trains on the
20 line that require a technician to attend and
21 potentially remove the train?

22 MR. CHARTER: Yes. From time to time,
23 yes.

24 MS. MCGRANN: Like, did the City
25 believe that these occurrences, these reliability

1 issues were going to continue to decrease as you
2 moved forward?

3 MR. CHARTER: Yes.

4 MS. MCGRANN: And what was the basis
5 for that belief?

6 MR. CHARTER: You know, every day the
7 trains are running, people are becoming more
8 familiar with the trains, more familiar with how to
9 troubleshoot them and, you know, their technicians
10 are able to be more proactive in identifying what
11 the root causes of those issues are and prevent
12 them from recurring.

13 So, you know, earlier on in the
14 process, there's identification of issues. They
15 identify what the root cause of those issues are.
16 They take actions to resolve those through, you
17 know, I mentioned many times the updates, software
18 updates or the train control updates. They make
19 those updates and then you see a reduction of those
20 issues. So with experience, with time, with
21 continual running of the vehicles, you know, we
22 were seeing a reduction and, you know, you
23 anticipate that you would see a continued reduction
24 in those.

25 MS. MCGRANN: With respect to the

1 reaction time and the quality of the reactions, how
2 is that being measured to support the belief that
3 it's going to continue to get better? How did you
4 assess that?

5 MR. CHARTER: Literally looking at the
6 frequency of occurrences and, you know, I guess it
7 was more of a qualitative discussion decision at
8 that point that, you know, we saw a reduction in
9 the issues and we're seeing the reliability there,
10 you know, improvement, and that led us to believe
11 that, you know, the trains were getting close to
12 ready ultimately led to the decision of substantial
13 completion in starting the trial running.

14 MS. MCGRANN: And with respect to those
15 software updates, I understand that some were
16 implemented that addressed some issues. Was there
17 a schedule or plan for additional software updates
18 that the City believed would continue to reduce the
19 number of reliability issues?

20 MR. CHARTER: Yeah, there were a number
21 of updates and planned updates. There was things
22 that were planned that were going to occur leading
23 post substantial completion but prior to revenue
24 service, and we also knew there was going to be
25 updates that were coming post revenue service but

1 after substantial completion.

2 So there was a number of retrofits and
3 updates that we were aware of and we were informed
4 and, you know, we used -- once again, we used the
5 consultants, the rail implementation office used
6 the people they were working with to assess was it
7 appropriate for some of these updates to occur pre
8 or post-substantial completion. So yeah, that was
9 -- that is part of it that the work was ongoing
10 with the vehicles and, you know, as I mentioned
11 earlier, these vehicles are with us for 30 years.
12 There's always going to be updates and changes to
13 them, and we continue to see that to this day and,
14 you know, it's not unlike what we do on our bus
15 fleet right now. We're not running line 2 right
16 now because it's going through an expansion project
17 as well, but we did see that in the first couple of
18 years with our new fleet there.

19 MS. MCGRANN: So I understand that
20 there was work to be done post substantial
21 completion. Was it the case that the City knew
22 that there was also work to be done post revenue
23 service availability and into the future?

24 MR. CHARTER: I'm trying -- I'm
25 thinking of a document in my head right now, and I

1 know that there was -- it was a fairly extensive
2 document that outlines a whole list of actions that
3 were both pre-substantial completion and
4 post-substantial completion and even some
5 post-revenue service, so I'd like to say yes, but I
6 am going a little bit on memory here without seeing
7 a document.

8 MS. MCGRANN: Okay. On the eve of
9 trial running, so right before trial running is to
10 get started, what reliability issues still remained
11 with the trains that the City was aware of?

12 MR. CHARTER: Beyond what I've
13 initially already stated, you know what, I don't
14 recall anything more than that. You know, vehicle
15 -- the vehicle side of things was the primary area
16 which we needed to focus on, and we continued to
17 see some improvement, and things were running very
18 well up until the start of trial running.

19 MS. MCGRANN: So the issues that you've
20 identified, the fault codes, the immobilizations of
21 the train on the line, those are still issues on
22 the eve of trial running but there aren't any other
23 reliability issues that you're facing?

24 MR. CHARTER: To my recollection, I
25 mean, I think that's fair. The reliability of the

1 trains was -- had greatly improved but I wouldn't
2 say it was perfect. And we know that there was
3 additional updates to come and ultimately they had
4 to pass trial running as well too.

5 And the trial running period and then
6 there was -- we knew there was going to be a period
7 of time before passenger service, so, you know,
8 there were a few other gates that needed to be
9 passed as well.

10 MS. PEDDLE: If you don't mind me just
11 jumping in here. I'm just wondering, you spoke
12 about looking at the frequency of occurrences in
13 terms of deciding whether they were going to
14 continue to decrease. Was there any reports or
15 trend documents, any kind of forecasting about
16 those occurrences?

17 MR. CHARTER: Not that I recall.

18 MS. MCGRANN: When I asked you about
19 the changes that you were seeing, at one point you
20 said you would have to look at the stats, what
21 stats were you referring to?

22 MR. CHARTER: So our control centre, we
23 track how service performed on any given day, and I
24 know that there's various reports and information
25 that Mr. Michael Morgan has as well from the rail

1 construction program, so, you know, I'm just --
2 just appreciate that it's been almost three years
3 since we've been in service and we have been
4 dealing with -- you know, we're obviously at a
5 public inquiry stage, so service hasn't been -- has
6 been less than desirable, although we've had some
7 real strong stretches of good reliable service,
8 there's been a number of instances that have been
9 -- the derailments specifically, so some of the
10 challenges, some of the issues tend to blend in for
11 me and sometimes I have a tough time discerning
12 what happened leading up to launch, what happened
13 just after launch. So that's why I just refer to
14 -- you know, I'd like to refer to some information
15 if I could, but I'm going by the best of my memory
16 as to what those issues were leading into trial
17 running and revenue service.

18 MS. MCGRANN: The issues with
19 reliability that exist on the eve of trial service,
20 you're aware of them. Am I right that others at
21 the City are also aware of them? Mr. Manconi and
22 everyone on RAMP was aware of these issues?

23 MR. CHARTER: Correct.

24 MS. MCGRANN: As you're standing on the
25 eve of trial readiness, and let me know if I've got

1 the order of things wrong here, but was there room
2 to move the revenue service availability further
3 into the future if required?

4 MR. CHARTER: Yes.

5 MS. MCGRANN: Would there have been
6 room to move the date of full public service,
7 opening the system up to the public into the future
8 if required?

9 MR. CHARTER: Yes.

10 MS. MCGRANN: At any point was it
11 articulated by anyone at the City what the
12 threshold would be or -- yeah, what the threshold
13 would be to require that kind of a change in the
14 anticipated schedule?

15 MR. CHARTER: I know I mentioned
16 earlier if there was any major safety concerns or
17 issues, you know, that was immediate sort of a red
18 stop. Moving no forward. Major -- I think any
19 sort of major disruption, like anything that
20 occurred such as a derailment or a catenary pull
21 down or any sort of those major issues that we
22 experienced upon start of service, those would have
23 been red flags to stop at that time. Or, you know,
24 I'd say even continued reliability issues on a
25 daily frequent basis. So, you know, we had that

1 go, no go list that I mentioned earlier. But, you
2 know, I'm not sure if there's -- you know, if there
3 was any sort of specific metrics that say if this
4 threshold was met it would be automatically
5 stopped.

6 We know that they did have to pass the
7 trial running process, and there was the
8 independent certifier that needed to sign off as
9 well as the safety certifier that needed to sign
10 off prior to going into revenue service. So there
11 were a few other checks and balances that were put
12 in place as well.

13 MS. MCGRANN: You mentioned with
14 respect to reliability if there were daily
15 reliability issues. Do you know if any specificity
16 was placed on from a reliability perspective up to
17 what point the City could live with it and beyond
18 which the City would say, no, we've got to look at
19 pushing the deadlines out?

20 MR. CHARTER: Not that I recall.

21 MS. MCGRANN: Who or which group of
22 people would be the ones to make a decision about
23 extending the time either to revenue service
24 availability on behalf of the City or the opening
25 to public service?

1 MR. CHARTER: So ultimately, you know,
2 it would be I'd say a recommendation from the
3 departmental leadership team working with the
4 general manager and the general manager then in
5 turn speaking with the City manager about next
6 steps. But, you know, sort of an effective
7 recommendation, I believe, from the departmental
8 leadership team to senior management, and then the
9 decision would be made there.

10 MS. MCGRANN: With respect to the trial
11 running, did you have any involvement in
12 determining the conditions that had to be met or
13 passed in order for the system to successfully
14 complete trial running?

15 MR. CHARTER: Yes, I was a member of
16 the trial running review team as well I was -- that
17 trial running review team were the ones that came
18 up with the initial criteria for successful
19 completion of trial running.

20 MS. MCGRANN: When was the trial
21 running review team struck, approximately?

22 MR. CHARTER: Months prior to
23 commencement of trial running, and they came up
24 with the trial running review procedures, and there
25 was a document that was produced as a result of it.

1 So months and months, maybe, you know, upwards of a
2 year in advance, but many months in advance of
3 trial running.

4 MS. MCGRANN: Who else was a member of
5 that team?

6 MR. CHARTER: We had the independent
7 certifiers as part of it. I was supported by Larry
8 Gall, a consultant from Capital Transit Partners;
9 Richard Holder from the rail implementation office,
10 and then there was Matthew Slade the project
11 director for OLRT. I think the general manager for
12 RTM at the time Mr. Claude Jacob was part of that.
13 I know he was hired at some point during -- prior
14 to trial running but during the testing commission
15 -- he was hired. We went through the whole
16 construction program, so I'm not sure exactly when
17 he came in, but he was part of it. And there -- I
18 believe there was one other person. I can't recall
19 his name that was part of OLRT working with
20 Mr. Matthew Slade.

21 MS. MCGRANN: Were all of those
22 individuals involved in setting the requirements to
23 pass trial running?

24 MR. CHARTER: Yes. We all worked on
25 the document action. There was one other name I

1 missed. We did work with a gentleman that we
2 brought in from Calgary Transit for a period of
3 time to assist us with the testing and
4 commissioning that transition over, Mr. Russell
5 Davies, so he helped develop the initial
6 documentation. Wasn't part of the trial running
7 review team but helped assist with the initial
8 drafting of the initial documents based on his
9 experience, so I missed that other person there
10 too.

11 MS. MCGRANN: The document or documents
12 that set out the requirements, did that set of
13 information have a name?

14 MR. CHARTER: Trial running TRRT --
15 trial running review --

16 MR. WARDLE: I can probably help with
17 this. I think there's a document called the trial
18 running test procedure. There's also some
19 documents created in 2017 called a request for
20 information. There's a whole series of documents
21 around trial running, but I think the one you're
22 speaking of is called the trial running test
23 procedure, and it went through, I think, two or
24 three drafts.

25 MR. CHARTER: Yes, iterations, that's

1 correct.

2 MS. MCGRANN: Other than creating and
3 revising the trial running test procedure, what
4 other responsibilities did the trial running review
5 team have?

6 MR. CHARTER: So once we went into
7 trial running was to basically assess and review
8 the previous day's performance and assign pass,
9 fail, restart, pause criteria.

10 MS. MCGRANN: So we've got pass, fail,
11 pause, and restart. Can you just explain to me
12 what each of those options is and how it played
13 into how the trial running worked?

14 MR. CHARTER: Yes, so obviously pass is
15 it met the conditions for that specific factor. So
16 we had things like end to end travel time, number
17 of trips that were -- number of trains that passed
18 a specific location. Those were designed to make
19 sure that we were getting the throughput to be able
20 to move upwards of 11,000 passengers per hour per
21 direction.

22 There was information with regards to
23 maintenance practices. As well we got into some
24 details on functionality of certain things like
25 CCTV cameras, the tunnel ventilation system,

1 station availability, those types of things.

2 So there's criteria for pass, and then
3 obviously if it wasn't a pass, it could have been a
4 fail. And then there was other criteria that if
5 you had so many failures, you could be a restart
6 or, you know, there was also a recognition that at
7 some point if there was something identified, you
8 could do a pause and restart of the trial running
9 period over again.

10 MS. MCGRANN: Okay, just to understand
11 this sort of ladder of decision-making, if it's a
12 pass, it's pass. I get that, onwards. If there's
13 a fail, are you then looking at whether you proceed
14 to a pause or a restart?

15 MR. CHARTER: Potentially, yes. Now, I
16 know that we had this procedure in place. And I
17 think everyone was well intentioned, and it was --
18 we'd been very public. I know Mr. Manconi spoke to
19 this. At the end of the day, as we're in that
20 trial running period, you know, there's that RFIO
21 document request for information Peter was
22 mentioning that outlined what was agreed to
23 previously in terms of the requirements for trial
24 running, and we ultimately ended up following that
25 document, that criteria, as opposed to what the

1 trial running review team came up with and that it
2 was well intentioned by all parties to follow that,
3 but we ended up following the 2017 document that
4 outlined here's the criteria for pass, fail through
5 trial running.

6 MS. MCGRANN: I will come to that in a
7 second. I just want to make sure I understand how
8 the trial running test procedure was intended to
9 work.

10 MR. CHARTER: Yeah.

11 MS. MCGRANN: Just so we've got that
12 covered off. If you hit a fail, I think the two
13 options that are available are pause and restart;
14 is that right?

15 MR. CHARTER: Correct.

16 MS. MCGRANN: And does restart mean you
17 restarting at the beginning of the 12-day trial
18 running period?

19 MR. CHARTER: Yes.

20 MS. MCGRANN: And if you restart at the
21 beginning of the 12-day trial running period is it
22 a blank slate restart or is it only a restart with
23 respect to elements that triggered a fail?

24 MR. CHARTER: Blank slate restart.

25 MS. MCGRANN: Okay. How do you get to

1 the pause option following a fail?

2 MR. CHARTER: I'd have to -- my
3 apologies. I'd have to look at the document
4 because I know there was different -- depending on
5 the element, there was different criteria and, you
6 know, this was part of the issue in that some of
7 the criteria wasn't well defined when that
8 procedure was put in place. But I'd have to look
9 at it. I know there was certain things from a
10 safety perspective if there was a major safety
11 issue that was identified, we could pause and
12 reassess as to whether or not we should proceed or
13 not, but it depended on what the criteria that was
14 in question. So I'd have to look at the document,
15 but I know that that was one of the concerns and
16 that was one of the issues was that there were
17 certain things that weren't as defined as they
18 should have been.

19 MS. MCGRANN: Just continuing to try to
20 understand how pause worked, and I understand that
21 you can't explain to me what would maybe get you
22 there, but once you get to a pause, what
23 potentially happened? Like, what happens then?
24 Are you paused in considering -- like, what are the
25 options to move from a pause?

1 MR. CHARTER: That's what we're looking
2 at is it a simple, you know, we're paused that day,
3 this day doesn't count as part of the overall
4 calculations to see if the pass trial running or do
5 we need to do a restart. Is this just -- I don't
6 want to -- it's not a defined term, but is it a
7 reset and say, okay no, we've been able to make
8 some adjustments, let's start back up and this is
9 one of the 9 of the 12 days or, you know, is this a
10 restart, or is it just a we need to assess that day
11 and move on.

12 MS. MCGRANN: When you say 9 of the 12
13 days, what are you referring to?

14 MR. CHARTER: That's where I'm getting
15 into the 2017 document that talked about the
16 requirements to achieve revenue service
17 availability, and that was defined 9 out of 12
18 days. Our document talked about 12 days of trial
19 running and I can't believe I can't remember it
20 right now, but it was 12 days of trial running and
21 I don't know if we needed to achieve 12 days with
22 all criteria or not, so that's where I'd have to
23 review that document a bit more. My apologies.

24 MS. MCGRANN: That's okay. The RFIO,
25 and it's a request for information, do you know

1 what the O stands for?

2 MR. CHARTER: No.

3 MS. MCGRANN: Peter, do you know what
4 the O stands for?

5 MR. WARDLE: I don't think there's an
6 O. It's a request for information.

7 MR. CHARTER: It's always been referred
8 to an RFIO I thought.

9 MR. WARDLE: And I'm just looking for
10 it. I can find it for you. But it's dated in
11 2017.

12 MS. MCGRANN: Okay. So maybe
13 Mr. Charter, we can ask you to after this interview
14 go away and see if you can figure out what the
15 acronym stands for and then let us know and we can
16 use that as an undertaking.

17 U/T MR. CHARTER: Sure.

18 MS. MCGRANN: Did the trial running
19 review team have reference to the RFIO when it was
20 putting together the trial running test procedure?

21 MR. CHARTER: Obviously the information
22 was available to the City, but when we were
23 creating the document, no, we didn't consider that.
24 It wasn't reviewed.

25 MS. MCGRANN: At what point in the 12

1 days of trial running was the decision made to
2 switch from using the trial running test procedure
3 to the RFIO as the document that governs whether
4 trial running has been accomplished.

5 MR. CHARTER: I believe it's right in
6 basically around the middle of August though not
7 sure the exact date, but around that 14th, 15th
8 date because I think we started using the new
9 criteria the 16th, the Friday.

10 MS. MCGRANN: So part of the way
11 through trial running a decision is made?

12 MR. CHARTER: Right.

13 MS. MCGRANN: When did discussions
14 about switching from the trial running test
15 procedure to the RFIO begin?

16 MR. CHARTER: Right around that time.
17 I mean it happened fairly quick. There was a
18 discussion on it. I know we discussed it at the
19 departmental leadership team and then I know
20 Mr. Manconi discussed it with his counterparts as
21 to the next steps, but, you know, at the time the
22 discussion was, you know, well intentioned to have
23 a real aggressive trial running review procedure,
24 there really was a lack of information in the
25 project agreement that defined what trial running

1 was intended to do, and there was an agreed upon
2 RFI previously. So those were factors that led
3 into the decision and I know up to that point we
4 were able to assess -- we had some several good
5 days of service. We were running 15 trains. We
6 were able to accomplish -- you know, we were able
7 to show on multiple days that we were able to meet
8 peak capacity. So that's ultimately why the trial
9 running review team supported and recommended
10 switch to the other criteria.

11 MS. MCGRANN: Okay. You said that the
12 purpose of the trial running period was not well
13 defined in the project agreement; is that right?

14 MR. CHARTER: Yes. That's my
15 understanding, yes.

16 MS. MCGRANN: Did the trial running
17 review team define a purpose for the trial running
18 period as part of the work that it did in preparing
19 the trial running test procedure?

20 MR. CHARTER: I'd like to say yeah, but
21 I'm not sure if I understand the question. We
22 wanted to -- very well intentioned to come up with
23 a real aggressive and look at, you know, a series
24 of elements of various systems and various
25 functionality. So we wanted to be very aggressive

1 and show it that, you know, all systems were
2 functioning as intended. But at the end of the
3 day, it was already a previously agreed upon
4 document that talked about that process. So
5 ultimately it assessed the same thing just the
6 level of granularity and the level of detail was
7 more aggressive in what we came up with than what
8 the -- than what was agreed to previously in 2017.

9 MS. MCGRANN: What started the
10 discussion about potentially switching from the
11 trial running test procedure to the RFIO?

12 MR. CHARTER: My recollection is that
13 RTG, Mr. Lauch at the time raised the issue that
14 there was this outstanding document and that's when
15 it started to be assessed at that time.

16 MS. MCGRANN: Do you know what
17 triggered him to raise that document?

18 MR. CHARTER: I do not.

19 MS. MCGRANN: Do you know who he raised
20 it to?

21 MR. CHARTER: I know that the trial
22 running review team did speak about it and, you
23 know, I don't want to make assumptions, but I would
24 assume that Mr. Lauch reached out to Mr. Manconi as
25 well, but that would be up for John or Mr. Lauch to

1 testify to.

2 MS. MCGRANN: How did you first learn
3 that a switch from the trial running test procedure
4 to the RFIO was being contemplated?

5 MR. CHARTER: Through our discussions
6 with the departmental leadership team which may or
7 may not have occurred at the RAMP meeting, but we
8 would have talked about it as a group.

9 MS. MCGRANN: And what kind of
10 assessment did the trial running review team make?
11 Let me ask you this, did the trial running review
12 team make any assessment of the implications of
13 switching from the trial running test procedure to
14 the RFIO?

15 MR. CHARTER: Ultimately, we did look
16 at it. And, you know, as I mentioned, the
17 independent certifier was part of that process as
18 well, and the whole group felt that we could move
19 to that and still meet the objectives of assessing
20 the functionality of the system and the trains and
21 make a good determination as to whether or not the
22 revenue service availability was met.

23 MR. WARDLE: If I could just add
24 something here. So the document the witness is
25 speak about is actually RFI-O-266. And the issue

1 is one specific part of the trial running
2 measurements. So it's called the average daily
3 AVKR. So that's what the change was about. And I
4 mean I don't want to interfere, but just so you
5 know that that's the context in which he's giving
6 his answers.

7 MS. MCGRANN: Okay. What role did the
8 IC play in the discussions about switching from the
9 trial running test procedure to the RFIO?

10 MR. CHARTER: They were looking at it
11 as the independent certifier as to whether or not
12 they were providing their independent opinion as to
13 whether or not substantial completion was met. And
14 it came down to, you know, would they have
15 sufficient information to make that determination.

16 MS. MCGRANN: Okay, so their role was
17 looking at the RFIO, the RFI -- call it the RFIO
18 for the purposes of this transcript because I think
19 we all know what we're talking about at this
20 point -- they took a look at the RFIO and
21 determined whether the criteria set out in that
22 document would provide them with sufficient
23 information to determine whether substantial
24 completion was met?

25 MR. CHARTER: Yeah. Well, ultimately

1 at the end of the day, the independent certifier
2 had to say whether or not -- provide their opinion
3 as to whether or not they felt that the conditions
4 for a readiness service availability were met. So
5 that's their context in this in that, you know, if
6 there was any -- if there was insufficient
7 information for them to make that determination, I
8 would have assumed they would have raised that
9 concern at the time.

10 MS. MCGRANN: So that was going to be
11 my next question. The focus is on the question of
12 whether revenue service availability was met
13 following trial running, am I right?

14 MR. CHARTER: Correct.

15 MS. MCGRANN: Do you know if anybody
16 explicitly told the independent certifier that that
17 was the role that they were playing in this? Like,
18 was it explicitly stated that the independent
19 certifier in looking at the RFIO and determining
20 whether that information would be sufficient for
21 them to determine revenue service availability?

22 MR. CHARTER: I can only assume. I
23 can't say definitively. I just don't have that
24 specific conversation with them but the terms of
25 why they were hired and what they were hired to do

1 would have been pretty clear. I can't assume.

2 MR. WARDLE: We provided to you the
3 report of the independent certifier. I have our
4 production number for it, but it refers directly to
5 the trial running team conclusion, and the trial
6 running criteria is stated in RFIO266.

7 MS. MCGRANN: It's part of why I'm
8 wondering whether the independent certifier could
9 be part of the decision-making team or the team
10 making the decision about whether the switch should
11 be made.

12 MR. WARDLE: Again, I don't want to
13 correct the witness, but I think from my
14 understanding, this is talking -- it's not about
15 the entire trial running criteria, it's simply
16 about one part of trial running and it's that
17 average AVEKR is what it's referred to in the
18 documents.

19 MS. MCGRANN: Did anybody raise any
20 concerns to your knowledge, Mr. Charter, about
21 switching from the trial running test procedure to
22 the RFIO for this component?

23 MR. CHARTER: Nothing specific but
24 obviously, you know, when you start a test, an
25 assessment, you don't want to be changing the

1 criteria midway through. So that was a concern,
2 and we knew that -- something is just popping up on
3 my screen. What's the question again?

4 MS. MCGRANN: The question was did
5 anybody raise any concerns about switching from the
6 trial running test procedure to the RFIO?

7 MR. CHARTER: No, nothing specific.
8 Nothing specific other than, you know, we knew that
9 this was something that we were going to have to
10 explain and discuss and inform counsel and the
11 Transit Commission on, and I believe Mr. Manconi
12 did that very publicly, but, you know, other than
13 that, no, we were still assessing whether or not we
14 felt that the system was ready for passenger
15 service, and we still felt confident at the time
16 that we had -- the criteria that was there would
17 still allow us to do that.

18 MS. MCGRANN: I mean just looking at
19 the change of 12 days of consecutive issues for
20 service, which is what I think was originally
21 envisioned by what was put together by the trial
22 running review team; is that right?

23 MR. CHARTER: Yeah. Like I said, I
24 wasn't sure if it was 12 consecutives days or 10 of
25 12, but that sounds accurate, yes.

1 MS. MCGRANN: Moving from that to 9 of
2 12 days -- sorry, Peter, I didn't hear what you
3 said there.

4 MR. WARDLE: So I think the 9 of 12
5 days was established in the 2017 document. Again,
6 I'm not trying to -- all the project agreement
7 talks about is 12 days. The 2017 document speaks
8 of 9 out of 12 days.

9 MS. MCGRANN: Right. What I was
10 referring to was the test that was in place or the
11 requirements that were in place at the start of
12 trial running, which I think the witness said
13 required 12 days.

14 MR. WARDLE: I don't think that's, in
15 fact, what the document says. So, again, I'm --

16 MR. CHARTER: I'd like to -- I'd like
17 to pull up the trial running review, you know, our
18 document that we had. I just want to refresh my
19 memory on that, but I know that the RFIO document
20 was 9 of 12 days with AA or AVKR of 90 percent.

21 MS. MCGRANN: So maybe we'll come back
22 to these questions when we pick up this interview
23 to make up for the time lost at the front end with
24 the assistance of documents in hand.

25 MR. CHARTER: Thank you.

1 MS. MCGRANN: It's not a memory test.
2 But I do want to understand how this all unfolded.
3 So you said that Mr. Lauch suggested using the
4 RFIO, that's what you understand happened?

5 MR. CHARTER: Yes, going by memory on
6 it, but I believe it would have been Mr. Lauch who
7 would have raised that, there's this outstanding
8 document in which we previously agreed to certain
9 criteria. Whether or not that was raised by
10 Mr. Lauch or Mr. Slade, it was brought forward and
11 that's when the discussion ensued.

12 MS. MCGRANN: Was it brought forward as
13 a result of anything? Like, did something cause
14 this conversation to start?

15 MR. CHARTER: No -- no, I can't think
16 of -- it came forward during trial running. I mean
17 I think it's well documented that there were some
18 ups and downs in trial running in the early days.
19 And that was anticipated that -- we didn't
20 anticipate that trial running was going to be
21 perfect from day one. The first couple of days,
22 you know, was I'll say trial running. And we went
23 into that with a bit of that mindset that, you
24 know, we need to start the process, we need to look
25 at it. And the only way you can really sort of

1 assess it is to make a decision and move forward.
2 So that's what we did, but there was an
3 understanding that it wasn't going to be perfect
4 from the first day and maybe even the first day
5 wasn't going to be a pass, and it wasn't.

6 MS. MCGRANN: The first day was not a
7 pass?

8 MR. CHARTER: No.

9 MS. MCGRANN: At the end of the first
10 day were you in a position where you're restarting
11 day one on the next day?

12 MR. CHARTER: I believe so. Once
13 again, for our next session I'll make sure I'm more
14 familiar with each one of the days, but I believe
15 the first day or two wasn't a pass day, so it
16 wouldn't have been counted as part of those 12
17 days.

18 MS. MCGRANN: Okay. How was the
19 performance during the trial running being
20 monitored.

21 MR. CHARTER: So we had -- there was
22 various people that were compiling various pieces
23 of information that were used. And then on a daily
24 basis the trial running review team would meet and
25 convene and review the previous day's information

1 and performance.

2 So as I mentioned, we had staff, or I
3 mentioned that one of the criteria was number of
4 trains passing a specific location. You know, that
5 would help determine were we achieving the headway,
6 so the train frequency. So that information was
7 supplied to us.

8 We looked at -- you know, we pulled
9 information from the control systems, I'll just
10 say, that, you know, to confirm whether or not the
11 stations were opened on time and closed on time.
12 What was the functionality of all the CCTV cameras.
13 Was the TVS operational the entire time?

14 So there was various -- information was
15 coming from various areas, you know, and, you know,
16 another piece of it was we got the travel time
17 information which helps support the train frequency
18 information. So every day the trial running review
19 team would meet and review the previous day's
20 information and, you know, assess sort of the
21 criteria that had been outlined as to was it a
22 pass, was it fail, and trying to apply a bit of
23 logic and rationale to it to a few of the findings.

24 MS. MCGRANN: When you said that you
25 tried to apply a bit of logic and rationale to a

1 few of the findings, what does that mean?

2 MR. CHARTER: This is where being part
3 of the decision to look at that trial running
4 review procedure was, I'll use an example of the
5 CCTV cameras. Again, we wanted to show full
6 functionality and we wanted some very robust and
7 very aggressive targets for reliability were set, I
8 believe was set at 99.5 percent. Reliability of
9 the cameras. Now what we found out as we got into
10 it was if we had one non-functioning camera that
11 wasn't rectified within the three to four hours
12 that it needed to be rectified, one non-functioning
13 camera in which there was redundant camera feeds
14 could result in a failure of that specific
15 component, and, you know, that wasn't the intent
16 and that wasn't what was contemplated.

17 There wasn't this level of detail in
18 the project agreement, and that certainly wasn't
19 the intent of the trial running review team was to
20 fail the day or to fail the criteria based upon one
21 non-functioning camera that had no safety or
22 security concerns because it was redundant camera
23 angles. So those are -- that's where I said we
24 tried to apply some logic and rationale to some
25 things.

1 If there was no service impact, if
2 there was no security impact, no security impact,
3 you know, and you're looking -- you're talking
4 about one camera, you know, that wasn't sufficient
5 to fail the day. So trying to be reasonable in
6 that regard because that's why you have multiple
7 cameras and redundant feeds and those types of
8 things is to deal with those situations, because,
9 you know we had -- we had some -- we had some minor
10 issues where we had some cameras that, you know --
11 spider webs were causing issues and we had this one
12 spider on this one camera that, you know, kept
13 popping up and we couldn't -- yeah, we couldn't see
14 through the camera.

15 We would submit a work order for it to
16 be rectified and if they didn't get to spiderweb
17 within, you know, the two hours or whatever the
18 criteria was, that would be a failure. Well, that
19 wasn't the intent.

20 So if it was something like the tunnel
21 ventilation system wasn't functioning for a period
22 of time, no, that's safety critical equipment.
23 That's a no brainer. That's an automatic fail. So
24 that's what I mean by trying to apply some logic
25 and reasonableness and rationale to things.

1 MS. MCGRANN: The deliberations of the
2 trial running review team, maybe that's not quite
3 the right word, but the work you did to review and
4 assess and determine the performance from the
5 previous day, what records were kept of that work,
6 the conversations, and the decisions made?

7 MR. CHARTER: So each day we recorded
8 on a scorecard -- we had it up on a board but then
9 it was ultimately recorded on a piece of paper and
10 everyone signed off on it what the metric was, what
11 was achieved, was it a pass, fail, and then
12 everyone signed off on it at the end of the day and
13 that included the independent certifier.

14 And as well throughout that process I
15 was supported by one of the industry experts that
16 we've been working with.

17 MS. MCGRANN: And who was that?

18 MR. CHARTER: That was Mr. Larry Gall.

19 MS. MCGRANN: You mentioned the camera
20 and the spider issue. What were the other issues
21 that you saw from the trial running period prior to
22 the decision to use the RFIO as part of the
23 criteria?

24 MR. CHARTER: There was, you know -- we
25 definitely experienced a disruption or two. I'd

1 have to look at the dates, but we definitely
2 experienced a disruption or two with the vehicles,
3 so the reliability of the vehicle did come into
4 question. As well, one of the things that we tried
5 to do a bit of a qualitative assessment on was the
6 use of -- I think it's determined on the document
7 was maintenance practices, so we wanted to assess
8 their use of their work order management system and
9 what we found was, you know, the work order
10 management system was utilized. It was tracking
11 defects, and it was tracking -- the issue was
12 reported. It was assigned to the person. The
13 person went and rectified it.

14 But, you know, there was issues with
15 regards to the timeliness of closing off on those
16 documents as well as the completeness of -- you
17 know, we wanted to see closing comments. You know,
18 here's exactly what I did to rectify the issue and
19 close it off. This issue is now closed, right. So
20 we wanted to see some very specifics. So they
21 didn't fair well in those maintenance practices.
22 But that was a bit more of a qualitative assessment
23 in which we were randomly selecting five work
24 orders.

25 You know, the system was functioning.

1 The system was being used. You could see it being
2 used. You could track issues from issue
3 identification submission to rectification, but
4 attributed to sort of a green workforce from the
5 RTM perspective, it wasn't being utilized as
6 effectively or as the way we wanted to see it. So
7 they didn't fair well on the maintenance practice
8 piece, but as I said, that was more of a
9 qualitative assessment, but that's something that
10 we saw was an ongoing issue.

11 CCTV cameras, while being minor was
12 something that we did experience, but, you know.
13 So of the main reasons for some of the pause and
14 the -- you know, as I'm talking, I'm remembering it
15 was repeat days, repeat criteria as well in there,
16 was related to vehicle reliability.

17 MS. MCGRANN: And what specifically
18 were the vehicle reliability issues, if you
19 remember?

20 MR. CHARTER: You know, going back
21 to -- you know, it would be a vehicle becoming
22 immobilised on a line or late launches, and the
23 late launches would have been attributed to those
24 fault codes that I talked about earlier that are
25 populating up prior to launch of vehicles.

1 But we did have -- there were a few
2 occurrences of a vehicle becoming immobilised that
3 resulted in what we call the diversion. So we can
4 still maintain service by going around a train, but
5 there's only certain locations in which you can go
6 around a train, so it's a reduced service at a
7 reduced frequency. So those were the types of
8 issues that came up during trial running.

9 MS. MCGRANN: And did those issues come
10 up also after the decision to change the criteria,
11 as we've already discussed?

12 MR. CHARTER: Possibly. There might
13 have been one or two, yeah. But the RFIO and even
14 the trial running review team, the criteria
15 contemplated that, you know, you could have these
16 issues and still provide a reliable service and,
17 you know, the issue is about, you know, timely
18 rectification and not repeat occurrences.

19 So that was always contemplated in the
20 trial running is that we weren't expecting
21 perfection. Things can happen and do happen on
22 rail lines, but we were expecting a certain level
23 of reliability and a certain degree of performance
24 during that period.

25 MS. MCGRANN: I'm just thinking about

1 how best to use the seven minutes that we have left
2 here knowing that we're going to have to come back.

3 Let's see if we can cover this. At any
4 point during your time working on OLRT stage one up
5 until the September 14th, 2019, opening to public
6 service, are you aware of any discussions of the
7 public service opening being less than full public
8 service? So starting with something less than that
9 and ramping up to full public service over a period
10 of time?

11 MR. CHARTER: Yeah. There were some --
12 I think there's some very early discussions that I
13 wouldn't say I was directly involved in that I'm
14 aware of, and then there was some discussions as we
15 got closer to launch of the term soft launch. Yes.
16 There were discussions of that nature, yes.

17 MS. MCGRANN: Starting with the early
18 discussions, approximately when did those take
19 place?

20 MR. CHARTER: I wouldn't want to fathom
21 a guess. I know it was early on in the process,
22 and I don't know.

23 MS. MCGRANN: What do you remember
24 about those early discussions?

25 MR. CHARTER: So what I'm aware of with

1 regards to the earlier discussions, and I
2 appreciate some of this is probably hearsay, but
3 there was some discussion about, you know, would
4 the City consider launching the system, you know,
5 not at full capacity with a reduced number of
6 trains, with potentially a -- so a reduced
7 frequency, with some station limitations and
8 possibly some system limitations.

9 So my understanding of what the
10 conversation was was more about, you know, I know
11 it was characterized as a soft launch, but from our
12 perspective, and at least what I was told, it was
13 more of a partial opening as opposed to a soft
14 opening. And that's why -- not contemplated in the
15 prong agreement but certainly, you know, not
16 something that the City could support given that
17 the nature of the line that we were building was
18 literally, it's -- we've said it many times
19 publicly, we replaced the spine of our bus network
20 with a rail network.

21 It was going to be busy and all parties
22 knew it was going to be busy from day one no matter
23 what we did, and a partial opening just didn't work
24 for the City, so we wanted to go with a full
25 opening and, you know, I know later there was

1 discussions about a soft opening and, you know, my
2 perspective on that is that that's exactly what we
3 did was a soft opening.

4 MS. MCGRANN: Before we talk about the
5 soft opening and those discussions, I just want to
6 stick with the early discussion for a second. If
7 you don't know the answer, just tell me, but I want
8 to understand the reasons why this wasn't an option
9 for the City. Is it the practical implications of
10 needing to run a bus service alongside a partial
11 light rail system? Like, what was about it that
12 wouldn't work, to your knowledge?

13 MR. CHARTER: So I can speak to
14 definitely I mean, if you're talking about partial
15 station opening and, you know, certain doors and
16 certain stairwells being opened, some stations
17 opened, some stations not, it just becomes a
18 logistical nightmare for customers. And we need to
19 keep in mind that, you know, our customers have
20 gone through years of disruption. You know, our
21 bus routes were all put on detours. People were
22 experiencing longer commute times, increased travel
23 time, increased congestion, and then factor in the
24 customer experience more delays in terms of running
25 the system, and there was this excitement about

1 having this rail line.

2 So it becomes a real communication and
3 logistical nightmare to try to, you know -- here's
4 where you can go, here's where can't. Here's what
5 functionality you have, here's what functionality
6 you don't. Oh, by the way, train frequency is only
7 this. It becomes really hard to message that the
8 system is ready to go.

9 You know, why would you open the system
10 if you had limited functionality and you didn't
11 have all the -- I don't want to over simplify it
12 and say bells and whistles, but if you don't have
13 the systems, you don't have the trains, you don't
14 have all the stations, why would you do a partial
15 opening? It's not ready.

16 And I know there's obviously more to it
17 than that, but that's from my perspective and from
18 some initial conversations that I've had with our
19 leadership team.

20 MS. MCGRANN: With respect to the soft
21 opening that was suggested or considered, when was
22 that?

23 MR. CHARTER: Again, I wouldn't want to
24 put a specific date to it. I know that it was in
25 the lead up to revenue service and probably most

1 likely surfaced a few times, but ultimately, I
2 think, you know, what was a soft opening, that's
3 the difference of opinion right now because the
4 City did take numerous steps to reduce the pressure
5 for the full scale opening.

6 You know, the steps that we took, you
7 know, we agreed to 13 trains as opposed to 15, peak
8 period service that matches our ridership because
9 when 15 train morning peak period requirement was
10 defined in the project agreement, we were at very,
11 very high ridership levels, and our ridership had
12 reduced over the subsequent years, so reduced
13 training frequency.

14 We introduced as well, you know, post
15 achievement of revenue service. It was going to be
16 a period of time in which OC Transpo was going to
17 have an additional two weeks of, you know, drills
18 and exercises and staff familiarisation. So there
19 was that two-week period built in prior to, you
20 know, actually starting to pick up customers.

21 Then, you know, in speaking once again
22 with the consultants that we worked with, you know,
23 when should we do the opening? Should it be a
24 weekend? Should it be a weekday? You know, if you
25 do a weekend, you get all the families coming out.

1 If you do a weekday, you know, you're right into
2 your Monday to Friday day-to-day grind. Do you do
3 hey, everyone come and open up. We're opening up
4 at 10 o'clock.

5 So we made some operational decisions
6 that time. We decided to do a weekend opening. We
7 did not offer free service. That was one of the
8 things that we heard loud and clear from other
9 places is don't do free service because you will
10 get people coming in droves and they will overtax
11 the system on day one. Don't do that.

12 And, you know, when we did open up, it
13 was the system will open up, we'll gradually open
14 up around 2 o'clock, so people could slowly filter
15 in. So, you know, but was it -- and then on top of
16 that, we had the parallel bus service for the first
17 three weeks of service.

18 So I think the City took a lot of
19 progressive steps to soften the opening but
20 recognizing that all the parties knew from the
21 beginning that this was a very busy line from day
22 one and it was always planned to be that. This was
23 not -- you might have heard the term Greenfield
24 verus -- you know it's not a Greenfield operation.
25 It's not a build the rail line and then all the

1 ridership will come as development goes up around
2 it. We put a line right throughout the downtown
3 core to alleviate congestion and the issues with
4 busses and all that sort of stuff, so it was known
5 from the beginning this was going to be a busy line
6 and it needed to have the reliability from day one.

7 MS. MCGRANN: Well, I have some more
8 questions for you, so we might as well leave it
9 there for now.

10 Thank you very much for your time today
11 and for all the efforts that you took to make the
12 virtual interview work. We can end the interview
13 here for today.

14 -- Whereupon the examination concluded
15 at 5:00 p.m.

16
17
18
19
20
21
22
23
24
25

REPORTER'S CERTIFICATE

I, COLLEEN REA, CSR, Certified
Shorthand Reporter, certify;

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

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

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

Dated this 13th day of April, 2022.

CRea

NEESON COURT REPORTING INC.

PER: COLLEEN REA, CSR

WORD INDEX

< 1 >

1 3:10 7:20, 21
10 108:24 124:4
100 3:4
11 78:6
11,000 95:20
12 78:6 99:9,
12, 17, 18, 20, 21
100:25 108:19,
24, 25 109:2, 4,
7, 8, 13, 20
111:16
12-day 97:17, 21
13 1:5 123:7
13th 1:9 126:16
14th 101:7
119:5
15 37:5 102:5
123:7, 9
15th 101:7
16 33:19
16th 101:9

< 2 >

2 86:15 124:14
2:00 1:10 4:1
20 24:23 25:15
2009 5:16 6:4
2011 8:11
2012 8:18 9:4
2014 9:5, 8
2015 9:19 10:25
2016 9:13 10:25
2017 94:19
97:3 99:15
100:11 103:8
109:5, 7
2018 65:20
2019 46:11, 16
47:4 50:16
51:5 52:19
53:20 58:15
59:4, 19 61:4
65:21 67:21
68:1, 24 72:4
78:19 119:5
2021 35:14
2022 1:5, 10
126:16

< 3 >

30 86:11

33(6 5:15
33(7 6:3
34 50:23 51:1
65:6 78:11

< 5 >

5 6:6
5:00 1:10
125:15
500 60:16

< 7 >

7 3:10

< 9 >

9 99:9, 12, 17
109:1, 4, 8, 20
90 109:20
99.5 113:8

< A >

AA 109:20
ability 16:5, 16,
17, 18, 20, 25
17:3 18:14
23:10 28:1
39:10
accept 14:23
16:16
accomplish
22:13 102:6
accomplished
101:4
accurate 7:17
108:25
accurately 35:7
accustomed
19:13

achieve 16:9
99:16, 21

achieved 48:5
53:12 74:18
115:11

achievement
123:15

achieving 112:5

acronym 49:1
100:15

Act 5:16 6:4, 7
26:6 27:2 30:4

action 39:8, 17,
18, 19 45:1
83:14 93:25

actions 43:3, 21
74:16 75:8
83:4 84:16 87:2
activate 47:9
activation 24:20
25:12 47:10
active 26:7
36:16 41:20
57:17, 19

actively 33:22
57:3 62:10, 19

activities 54:10
57:22 58:9

activity 58:19

actual 42:1
44:17 58:22

adamant 53:5
76:24

add 8:4 104:23

additional 8:4
17:15 18:2
29:3 85:17
88:3 123:17

additionally 21:4

address 39:11

addressed
72:15 74:6
85:16

ADJOURNMENT
47:1

adjustments
66:15 71:14
74:10 99:8

advance 15:6, 9
41:10 93:2

advice 56:20
57:5

advised 6:4

advising 77:19

advisory 53:23
54:6

affect 33:17

after 5:3 43:11,
21 72:24 86:1
89:13 100:13
118:10

afternoon 4:3

aggressive
101:23 102:23,
25 103:7 113:7

agreed 96:22
102:1 103:3, 8
110:8 123:7

agreement 63:8,
9, 14 101:25

102:13 109:6
113:18 120:15
123:10

alerts 14:9

aligned 23:19

alleviate 125:3

allow 21:22
108:17

allowing 38:14

alongside
121:10

Alstom 26:13
27:6, 14, 17
28:7, 14 30:7
31:8 35:19
38:10 39:2, 23
50:6 62:13, 16
81:1, 14 82:19

amount 67:3

analyse 64:12

angles 113:23

answered 79:12

answers 7:9
29:24 74:23
105:6

anticipate 76:25
84:23 110:20

anticipated
15:20 46:19
57:14 65:2
66:17 90:14
110:19

anticipation
66:20

anybody 14:19
22:9 106:15
107:19 108:5

apologies 98:3
99:23

appear 3:4

appended 5:14

apply 112:22,
25 113:24
114:24

applying 76:3

appreciate
42:16 89:2
120:2

approach 19:8,
12, 17, 22 22:14
31:11

approached
71:2 81:24

approaching

69:24

appropriate 86:7

appropriately
18:21

approved 72:13

approximately
92:21 119:18

APRIL 1:5, 10
126:16

area 87:15

areas 8:3
18:13 27:20, 21
28:9 33:23
39:10 112:15

ark 40:15

arm 55:12

articulated
90:11

ascertain 71:19

aside 36:25
61:14

asked 5:18
6:19 32:3
43:16 88:18

asking 29:25
47:3

aspect 16:6

aspects 22:14
41:19

assess 39:14
56:25 74:21
85:4 86:6 95:7
99:10 102:4
111:1 112:20
115:4 116:7

assessed 37:25
103:5, 15

assessing
104:19 108:13

assessment
29:11 54:12
104:10, 12
107:25 116:5,
22 117:9

assessments
39:11

assign 95:8

assigned 116:12

assist 17:16
26:14 62:7
94:3, 7

assistance
77:19 109:24

assistant 9:9
10:12

assisted 17:24
26:16
assisting 54:23
associate 10:12
assume 73:20
103:24 106:22
107:1
assumed 106:8
assumptions
103:23
attend 39:2
49:21 70:5
80:12 83:12, 20
attended 44:11
attending 1:9
attention 75:2
attribute 73:11
attributed 73:9
75:7 117:4, 23
audio 22:3, 20
44:4 46:25
augmented 18:1
August 35:13
43:8, 17 45:2
101:6
authorization
39:7
authorized
38:10
automatic
114:23
automatically
91:4
availability
16:10 46:15
49:6 51:1 53:2,
7, 16 61:13
66:6 86:23
90:2 91:24
96:1 99:17
104:22 106:4,
12, 21
available 17:1
26:25 79:10
97:13 100:22
AVEKR 107:17
average 105:2
107:17
AVKR 105:3
109:20
aware 23:9
58:22, 23 59:3
71:21 79:18
86:3 87:11

89:20, 21, 22
119:6, 14, 25
awareness 58:3

< B >
back 18:22
28:18 46:10
52:6, 21 53:8, 9
64:12, 16 71:23
99:8 109:21
117:20 119:2
balances 91:11
based 35:5
66:25 67:4, 17
74:11, 12 94:8
113:20
basically 14:7
26:23 95:7
101:6
basis 5:8
34:11 59:2
73:23 75:24
84:4 90:25
111:24
bays 80:2
becoming 42:12
70:24 84:7
117:21 118:2
bedding 70:11,
14
beginning 20:4,
7 46:11, 15
76:8 79:21
97:17, 21
124:21 125:5
behalf 76:4
91:24
belief 73:1, 24
74:24 84:5 85:2
believe 16:19
32:21 33:19
42:18 48:13
54:6, 7 63:13
74:17 78:16
83:25 85:10
92:7 93:18
99:19 101:5
108:11 110:6
111:12, 14 113:8
believed 85:18
bells 122:12
benefits 40:12
41:24 42:2
60:22 69:9 82:5

Bergenline
17:20 20:25
best 19:15
21:19 22:9
23:2 89:15
119:1
better 41:1
42:17 81:1 85:3
big 18:7
bike 21:20
binder 12:24
bit 7:5, 9, 10, 15
20:18 22:3
24:11 27:23
32:11 41:11
54:6, 14 83:11
87:6 99:23
110:23 112:22,
25 116:5, 22
biweekly 47:20
blank 97:22, 24
blend 89:10
board 40:14
115:8
boardrooms
47:12
boards 47:13
Boston 17:19
21:3, 24
bounce 46:10
brainer 114:23
brakes 37:9
brand 67:14
break 6:9, 14
10:7 31:20
43:7, 16 47:2
breaker 82:16
breakers 83:5
breaks 6:16
Brian 58:4
68:19
brief 31:20
bring 7:12 26:3
80:2
bringing 26:4,
23 29:3 30:1
brought 17:15,
17, 20 29:10
54:8 58:6
79:22 94:2
110:10, 12
build 59:11
124:25
building 120:17

built 123:19
bulletins 33:16
bus 12:2 13:4
25:21, 23 66:21
67:13 86:14
120:19 121:10,
21 124:16
busses 125:4
busy 23:13
120:21, 22
124:21 125:5
Butt 2:17

< C >
calculations
99:4
Calgary 21:23
23:20 94:2
call 27:3 49:18
50:16 55:9
105:17 118:3
called 24:21
25:11 47:10
94:17, 19, 22
105:2
calls 80:22
camera 44:3
113:10, 13, 21,
22 114:4, 12, 14
115:19
cameras 95:25
112:12 113:5, 9
114:7, 10 117:11
Canada 6:6
capacity 102:8
120:5
Capital 20:22
22:5 68:15, 17
93:8
captured 35:7
63:8
car 39:3
carbon 55:16, 25
Carly 2:4 4:7
case 28:6 86:21
categories 59:3
catenary 54:19
55:4 90:20
caused 50:25
caveat 7:5
CBT 16:12
CBTC 16:2
34:24 58:25
60:2 62:1
63:25 69:9

CCTV 95:25
112:12 113:5
117:11
centre 14:9
15:5 21:12
24:16 28:6
88:22
certain 4:18
9:25 21:20
27:20 38:9, 11
41:19 53:5
57:19 60:5
67:2 75:20
95:24 98:9, 17
110:8 118:5, 22,
23 121:15, 16
certainly 113:18
120:15
CERTIFICATE
126:1
certification
47:15 72:21
certified 78:12
82:14 126:3
certifier 72:17
91:8, 9 104:17
105:11 106:1,
16, 19 107:3, 8
115:13
certifiers 93:7
certify 126:4
cetera 62:7
challenge 15:17
27:24 28:23
challenged
15:15 27:22
60:7
challenges
28:11 50:22
51:3, 4, 8 54:21
79:18 80:13
81:5 89:10
change 19:7, 17,
18 20:1 34:24,
25 56:7 67:17
90:13 105:3
108:19 118:10
changed 9:11
49:2
changes 15:12
33:12, 17 40:15
45:12 46:5
82:5 86:12
88:19

<p>changing 19:15 107:25</p> <p>characterized 120:11</p> <p>CHARTER 1:4 2:8, 10 3:10 4:2, 4 6:12, 17 7:1, 4, 11, 22 8:2, 12, 17, 20 9:1, 7, 10, 14, 18 10:11 11:1, 12, 17, 21 13:1, 19, 22 14:25 15:14 16:7, 17 17:6 18:16 19:10, 25 20:19 22:6, 15 23:4 24:18, 24 25:3 26:8 27:6, 20 28:10 29:7 30:9 31:14 32:10, 21 33:13 34:17, 22 35:8, 15 36:19 38:2 39:15 40:3, 17 42:3 43:5, 23 44:20 45:16, 23 46:9, 17 47:8 48:9, 18 49:1, 7, 23 50:7, 12, 21 51:6 52:4, 20 53:17 54:1, 5 55:2 56:5, 22 58:1, 16 59:5, 22 60:13 61:8, 14, 24 62:9, 25 63:13 64:23 65:18 66:8, 12 67:4, 25 68:17 69:2, 25 71:4, 21 72:5 73:4 74:2 75:4 76:11 78:1, 22 79:19 80:21 81:18 82:1, 13 83:22 84:3, 6 85:5, 20 86:24 87:12, 24 88:17, 22 89:23 90:4, 9, 15 91:20 92:1, 15, 22 93:6, 24 94:14, 25 95:6, 14 96:15 97:10, 15, 19, 24 98:2 99:1, 14 100:2,</p>	<p>7, 13, 17, 21 101:5, 12, 16 102:14, 20 103:12, 18, 21 104:5, 15 105:10, 25 106:14, 22 107:20, 23 108:7, 23 109:16, 25 110:5, 15 111:8, 12, 21 113:2 115:7, 18, 24 117:20 118:12 119:11, 20, 25 121:13 122:23</p> <p>check 30:20 46:24</p> <p>checklists 17:24</p> <p>checks 91:11</p> <p>cheek 42:5</p> <p>chief 45:4 48:13</p> <p>child 34:9</p> <p>choppy 7:10</p> <p>chronology 24:11</p> <p>circumstance 37:3</p> <p>circumstances 35:9</p> <p>CITY 1:4 8:24 11:5 21:18 43:9, 19 44:16 45:13, 21 46:12 47:3 50:5 53:7 54:18, 22, 23 56:17, 21 58:23 74:12 76:14 77:18, 23 78:1 81:12 83:24 85:18 86:21 87:11 89:21 90:11 91:17, 18, 24 92:5 100:22 120:4, 16, 24 121:9 123:4 124:18</p> <p>City's 32:19 50:13 53:11 79:14</p> <p>civil 5:21</p> <p>clarify 32:11, 23</p> <p>Claude 93:12</p>	<p>clear 107:1 124:8</p> <p>cleared 51:18 52:12 72:24</p> <p>close 38:14, 15 85:11 116:19</p> <p>closed 112:11 116:19</p> <p>closely 23:18</p> <p>closer 7:12 25:8 47:18, 19 81:6 119:15</p> <p>closing 116:15, 17</p> <p>co-counsel 4:17</p> <p>code 78:20 82:10</p> <p>codes 51:16, 18, 21, 25 52:9 59:1 69:11 70:23 79:21 81:15 82:14 83:18, 19 87:20 117:24</p> <p>Co-Lead 2:3 4:5</p> <p>collaboration 40:1</p> <p>collaborative 4:16</p> <p>colleague 46:22 47:5, 23 48:12 50:8 53:8 71:22</p> <p>colleagues 15:17</p> <p>collect 45:8 55:7</p> <p>collected 12:25 35:18, 19 39:12 45:24</p> <p>collecting 14:12 44:21</p> <p>collectively 68:8</p> <p>Colleen 2:16 126:3, 21</p> <p>combination 25:21 56:23 59:10</p> <p>come 12:12 18:22 39:17 40:12 41:10 58:13 70:10 77:17 82:25 88:3 97:6 102:22 109:21</p>	<p>116:3 118:9 119:2 124:3 125:1</p> <p>comes 17:13 55:12 60:19</p> <p>coming 28:8 29:1, 5 49:12, 18 59:2 71:14, 23 82:19 85:25 112:15 123:25 124:10</p> <p>commandeered 47:11</p> <p>commenced 4:25</p> <p>commencement 20:10 92:23</p> <p>commencing 4:1</p> <p>comments 116:17</p> <p>COMMISSION 1:3 2:1, 4 4:22 93:14 108:11</p> <p>commissioning 12:16 15:9 61:7, 21 62:8 63:12 64:20 65:1, 16 66:4 94:4</p> <p>Commission's 4:15, 23 5:2, 7</p> <p>committed 26:9</p> <p>committee 56:19</p> <p>committees 56:21 57:3</p> <p>common 33:23</p> <p>communicate 8:1</p> <p>communication 33:25 80:25 122:2</p> <p>communications 51:9, 22 58:24</p> <p>commute 121:22</p> <p>comparable 26:5</p> <p>comparative 21:23</p> <p>comparator 24:5</p> <p>compiling 111:22</p> <p>complete 78:7 92:14</p>	<p>completely 23:11 24:3</p> <p>completeness 116:16</p> <p>completion 15:2 46:14 47:13 48:3, 5 49:6 53:15 61:12 66:5 72:7, 9, 14, 24 74:5, 18 78:9 79:6 81:7 85:13, 23 86:1, 8, 21 87:3, 4 92:19 105:13, 24</p> <p>complex 82:20, 21</p> <p>component 107:22 113:15</p> <p>components 56:3</p> <p>compression 64:20 65:4</p> <p>comprised 53:24</p> <p>computer-based 14:4 23:9 24:3 51:11, 23 62:2 64:5 69:16</p> <p>concern 58:17 59:8, 12 106:9 108:1</p> <p>concerned 56:10</p> <p>concerns 53:4 54:18 72:2, 9, 23, 25 75:17 78:10 90:16 98:15 107:20 108:5 113:22</p> <p>concluded 125:14</p> <p>conclusion 107:5</p> <p>condensed 17:7</p> <p>conditions 92:12 95:15 106:3</p> <p>conduct 83:1</p> <p>conducted 42:24 43:18</p> <p>Confederation 10:22</p> <p>confident</p>
--	--	--	---	---

<p>108:15 confidential 5:8 confirm 112:10 congestion 121:23 125:3 connections 12:20 68:6, 12 consecutive 108:19 consecutives 108:24 consider 26:4 100:23 120:4 considerable 15:21 consideration 57:13 considered 27:5 122:21 considering 98:24 constrain 17:4, 5 constrained 16:18 17:11 construction 10:18 13:24 14:13 15:1 20:2 25:9 47:24, 25 48:2, 20, 23 50:13 52:23 58:10 89:1 93:16 constructor 14:1 50:10, 14 74:17 consultant 56:24 93:8 consultants 21:16 24:8 29:8 30:12 57:24 68:5 86:5 123:22 consulting 20:21 contemplated 104:4 113:16 118:15, 19 120:14 content 19:16 context 105:5 106:5 continual 84:21 continually 60:17</p>	<p>continuation 81:10 continue 23:3 33:25 70:17, 18 84:1 85:3, 18 86:13 88:14 continued 28:16 33:14 59:13 78:18 81:11 84:23 87:16 90:24 continuing 68:4 81:23 98:19 contract 25:2 50:13 contracted 33:1, 4 control 14:4, 9 15:5 21:12 23:10 24:4, 16 28:6 29:5 30:3 51:11, 23 60:1 62:1, 3, 18 64:5 69:8, 16 84:18 88:22 112:9 controller 33:3 62:18 controllers 32:25 33:6 44:24 61:25 62:6 63:15 controlling 61:25 convene 111:25 conventional 13:4 conversation 44:1 106:24 110:14 120:10 conversations 67:1 70:10 115:6 122:18 cooperation 62:22 63:1, 5 copy 6:19 7:2 core 125:3 correct 5:10 8:20 49:22 53:17 61:14 65:17 66:8 89:23 95:1 97:15 106:14 107:13 126:14 correcting 72:8</p>	<p>corrections 5:3, 6, 13 corrective 39:8 83:14 COUNSEL 2:1, 3, 4, 10 4:5, 7, 18 5:7 6:19 108:10 count 99:3 counted 111:16 counterparts 101:20 couple 7:16 15:25 22:1 24:1 68:9 70:16 86:17 110:21 course 31:22 67:3 court 46:24 126:20 cover 119:3 covered 63:9 71:25 97:12 covering 63:11 create 30:19 created 24:20 57:10 94:19 creating 11:23 14:16 17:10 95:2 100:23 criteria 92:18 95:9 96:2, 4, 25 97:4 98:5, 7, 13 99:22 101:9 102:10 105:21 107:6, 15 108:1, 16 110:9 112:3, 21 113:20 114:18 115:23 117:15 118:10, 14 critical 114:22 cross 29:19 cross-function 22:17 cross-section 23:16 Crown 5:22 crunch 18:7, 23 crunches 65:10 CSR 126:3, 21 CT 23:22 CTP 53:24</p>	<p>current 7:6 curve 77:2 curves 77:4 customer 121:24 customers 25:20, 22 29:17 61:18 121:18, 19 123:20 cutout 22:4 < D > daily 47:20 59:2 75:24 90:25 91:14 105:2 111:23 Dallas 17:19 20:23 21:9 DART 20:24 date 90:6 101:7, 8 122:24 dated 100:10 126:16 dates 53:2 54:14 116:1 Davies 94:5 day 1:9 12:12 23:14 25:5 52:7 60:16 79:6, 11 84:6 86:13 88:23 96:19 99:2, 3, 10 103:3 106:1 110:21 111:4, 6, 10, 11, 15 112:18 113:20 114:5 115:5, 7, 12 120:22 124:11, 21 125:6 126:16 days 10:15 27:9, 18 40:18 61:15 64:11 65:6 77:5 99:9, 13, 18, 20, 21 101:1 102:5, 7 108:19, 24 109:2, 5, 7, 8, 13, 20 110:18, 21 111:14, 17 117:15 day's 95:8 111:25 112:19</p>	<p>day-to-day 12:5 40:22, 23 58:9 124:2 deadlines 91:19 deal 114:8 dealing 69:25 73:11 89:4 dealt 18:20 71:7 debrief 38:3 debriefs 34:3 35:11, 12, 22 36:1, 10 39:16, 24 40:10, 20, 25 41:17, 23 42:24 decided 23:12 124:6 deciding 88:13 decision 77:17 85:7, 12 91:22 92:9 101:1, 11 102:3 107:10 111:1 113:3 115:22 118:10 decision-making 96:11 107:9 decisions 18:3 43:3 74:15 115:6 124:5 declaration 4:15 decrease 84:1 88:14 decreasing 70:8 dedicated 24:25 25:12, 13 26:13 deemed 5:17 defect 35:23 defects 116:11 defer 20:7 define 102:17 defined 25:3 64:11 73:5 78:14 98:7, 17 99:6, 17 101:25 102:13 123:10 definitely 41:15 56:5 69:20 75:15 115:25 116:1 121:14 definitively 106:23 degree 9:25 66:22 77:6 118:23</p>
--	---	---	--	---

<p>delay 50:25 64:24 65:15, 19 83:11 delays 15:12, 18, 21 16:4 18:18 80:8 121:24 deleted 46:1 deliberations 115:1 delivered 19:6 53:21 78:11 delivery 19:5 demonstrate 16:12 department 11:4 departmental 22:15 23:5 24:19 46:18 47:22 48:15 76:5 77:11 92:3, 7 101:19 104:6 depend 83:7 depended 98:13 depending 13:8 37:3 64:3, 17 83:3 98:4 depends 35:8 derailment 37:1 43:8, 11, 17, 19 44:9, 14, 19 45:2, 15, 18, 22 46:8 90:20 derailments 35:13 36:2 42:14, 19, 22 43:22 89:9 describe 11:18 40:9, 15 43:1 described 14:21 18:17 26:22 describing 16:3 22:2 78:4 descriptions 11:24 design 34:21 designed 25:16 95:18 designs 34:15 desirable 89:6 detail 103:6 113:17 detailed 35:17,</p>	<p>21 36:2 details 95:24 determination 54:23 104:21 105:15 106:7 determinative 77:16 determine 14:5 22:10 83:2 105:23 106:21 112:5 115:4 determined 105:21 116:6 determining 11:25 92:12 106:19 detours 121:21 develop 16:22 65:25 77:18 94:5 developed 16:24 35:5 developing 12:3 19:22 development 17:24 125:1 devices 14:8 diagnosis 83:2, 13 dialogue 41:5 59:25 62:11 76:21 difference 123:3 different 8:25 20:13 24:6 26:20 35:16, 20 42:23 48:24 57:12 64:3, 18 98:4, 5 DIFFICULTIES 10:2 32:14 digest 17:21 digested 17:14 direct 24:5 direction 6:24 69:19 95:21 directly 7:13 14:14 29:22 30:18, 23, 24 46:21 49:20, 25 50:6 53:22 57:6, 8 76:15, 17 107:4 119:13</p>	<p>director 9:11, 13 10:12 20:3, 8, 9 30:16 93:11 directors 48:11, 17 discerning 89:11 discuss 22:8 108:10 discussed 43:1 101:18, 20 118:11 DISCUSSION 10:5 22:23 31:24 32:15 41:11 43:14 46:22 52:21 85:7 101:18, 22 103:10 110:11 120:3 121:6 discussions 14:15 62:11 76:21 101:13 104:5 105:8 119:6, 12, 14, 16, 18, 24 120:1 121:1, 5 disruption 34:4 90:19 115:25 116:2 121:20 disruptions 56:9 58:18 73:17 77:6 disturbed 59:9 diverse 24:7 diversion 118:3 DLT 50:3 document 6:21, 22, 25 7:18 66:19 78:6 86:25 87:2, 7 92:25 93:25 94:11, 17 96:21, 25 97:3 98:3, 14 99:15, 18, 23 100:23 101:3 103:4, 14, 17 104:24 105:22 109:5, 7, 15, 18, 19 110:8 116:6 documentation 41:1 48:4 72:10, 18 94:6 documented 110:17</p>	<p>documents 17:10 88:15 94:8, 11, 19, 20 107:18 109:24 116:16 doing 10:8 11:15 17:11 31:6 37:18 40:19 41:16 45:14 46:13 47:4 50:20 54:2 60:16 82:22 door 38:12, 13, 15, 20, 23 doors 121:15 downs 110:18 downtown 125:2 drafting 94:8 drafts 94:24 drills 34:6 123:17 driven 30:14 driver 30:13 31:1 43:25 44:7, 8 79:24 driverless 23:11 24:4 drivers 26:3, 6 27:1 28:5 29:5, 21 31:2 32:1, 24 33:9 43:3 61:9, 22, 24 62:6, 17 63:15 driver's 43:10, 20, 24 driving 24:15 25:4 26:5, 7 27:1 61:9, 22, 24 63:22 65:22, 24 dropped 31:19 droves 124:10 duration 42:12 duties 11:6 39:12 Dwyer 58:4 68:19 < E > earlier 46:20 54:16 57:9 59:15 65:6, 10 69:7, 11 71:12 72:6 75:16</p>	<p>79:19 81:18 83:1 84:13 86:11 90:16 91:1 117:24 120:1 early 10:15 27:9, 18 40:18 47:4 52:18 53:20 58:14 59:4 61:15 73:8 77:1, 5 81:4 110:18 119:12, 17, 21, 24 121:6 earmarked 45:25 easy 83:9 echo 76:6 effective 92:6 effectively 72:15 117:6 efficient 27:19 effort 62:21 efforts 125:11 egress 57:13 element 56:12 98:5 elements 47:16 49:12 51:14 97:23 102:24 embedded 56:20 57:16 emergency 34:10 57:13 72:11 employed 20:20 employees 24:15 enacted 29:13 encountering 74:3 ended 26:17 96:24 97:3 engage 78:19 engaged 57:24 62:10, 19 engineers 77:3 engrained 25:25 ensued 110:11 ensure 18:2 35:6 64:6 enter 4:22 entered 5:3, 8, 12 7:20 79:17 entering 80:8</p>
---	---	---	--	---

<p>entire 13:13 55:19, 25 76:12 107:15 112:13 entities 52:17 entity 25:24 entries 53:22 envisioned 64:22 65:17 108:21 equipment 114:22 error 38:24 errors 5:11 escapes 20:10 especially 27:9 73:7 75:25 Esq 2:9, 11 Essentially 48:14 78:3 establish 5:20 established 13:23 109:5 eve 87:8, 22 89:19, 25 events 21:10 41:7 57:12 59:6 77:20 evidence 4:10, 14, 23 5:4, 9, 12, 24 6:2, 6 exact 25:14 32:5 101:7 exactly 29:9 78:4 93:16 116:18 121:2 examination 125:14 126:11 examining 29:25 example 15:4 21:8 22:12 26:2 30:12 36:14, 15 41:18 56:13 64:4 113:4 exceeded 28:1 excitement 121:25 exercises 34:7 123:18 Exhibit 7:20, 21 EXHIBITS 3:7 exist 89:19 existed 8:15 exit 44:8 expanded 67:6</p>	<p>expansion 9:22 10:16 86:16 expect 76:25 81:14 expecting 118:20, 22 experience 17:18 20:17, 23, 25 24:8 26:5, 24 28:23 30:2 40:16 43:21 44:18 45:20 67:5 68:7, 10 73:18 74:13 80:10 84:20 94:9 117:12 121:24 experienced 23:17 36:11 44:7, 8 52:25 62:15 65:23 69:7 71:9 90:22 115:25 116:2 experiencing 53:10 63:20 70:14 121:22 expert 20:24 21:1 expertise 30:22 39:7 68:11 experts 17:16, 18, 21 18:2 20:13, 15, 20 21:15 22:3 29:14 54:14, 15 56:15, 16, 25 68:5, 15 76:13 77:12 115:15 explain 95:11 98:21 108:10 explicitly 106:16, 18 extended 75:13 82:3 extending 91:23 extension 10:16 extensive 87:1 < F > facility 51:19 52:2, 7 79:25 81:21 facing 87:23</p>	<p>fact 7:24 109:15 factor 52:1 95:15 121:23 factors 50:25 80:24 102:2 fail 95:9, 10 96:4, 13 97:4, 12, 23 98:1 112:22 113:20 114:5, 23 115:11 failure 52:9 59:1 113:14 114:18 failures 96:5 fair 11:11 87:25 116:21 117:7 fairing 50:19 fairly 13:2 83:9 87:1 101:17 familiar 58:7 84:8 111:14 familiarisation 123:18 families 123:25 fashion 18:14 fathom 119:20 fatigue 12:8 fault 51:16, 21, 25 52:8 59:1 62:13 69:11 70:23 78:20 79:20 81:15 82:10, 13 83:18, 19 87:20 117:24 February 50:16 51:5, 7 fed 79:1 feedback 21:24 28:13, 15 41:21 56:14 62:5 67:24 74:12 feeds 113:13 114:7 felt 104:18 106:3 108:14, 15 figure 100:14 file 39:13 filter 124:14 final 36:7 find 39:4 67:15 75:23 100:10 findings 112:23</p>	<p>113:1 finish 47:6 finishing 9:22 10:15, 18 fire 72:11 firm 33:1 fixes 71:19 flag 44:2 46:3 flagged 46:1 flags 90:23 fleet 64:15 66:21 67:8, 13 86:15, 18 Flemming 2:11 31:18 floor 23:10 focus 10:15 17:2 29:20 36:1 87:16 106:11 focussed 12:7 35:22 36:21 40:19 Focussing 57:21 follow 43:5 64:18 97:2 followed 46:4 following 3:4 42:23, 25 43:18 45:19, 21 46:7 96:24 97:3 98:1 106:13 followup 22:1 follow-up 4:19 food 21:22 footage 44:3, 4 45:25 forecasting 88:15 foregoing 126:5, 13 foresaw 80:15 form 74:24 77:16 formal 25:8 36:19, 20 52:22 format 19:13 formatting 19:14 formed 20:21 53:1 76:10 former 30:12 formulating 14:16</p>	<p>forth 16:10 52:21 64:17 126:7 forward 16:14 72:20 76:22 77:21 84:2 90:18 110:10, 12, 16 111:1 found 12:7 113:9 116:9 four-page 6:22 free 82:4 124:7, 9 frequency 42:11 60:24 70:8 73:21 75:14 82:2 85:6 88:12 112:6, 17 118:7 120:7 122:6 123:13 frequent 90:25 frequently 25:11 Friday 101:9 124:2 front 30:11, 19 109:23 full 65:6 90:6 113:5 119:7, 9 120:5, 24 123:5 fully 23:21 function 14:11 27:8 71:19 functionality 15:6 34:25 59:23 60:21 71:13 72:10 95:24 102:25 104:20 112:12 113:6 122:5, 10 functioned 27:21 functioning 103:2 114:21 116:25 functions 38:9 future 36:6 86:23 90:3, 7 < G > Gall 58:4 68:19 93:8 115:18 gaps 25:1 gates 88:8</p>
---	--	--	--	--

gathered 12:23
44:13
general 9:9
10:13 11:2
13:10 48:10
57:6 92:4 93:11
generally 42:10
43:20 83:8
gentleman 94:1
give 4:10
36:14 41:7
given 5:9, 23
64:24 88:23
120:16
gives 14:9
41:6, 8
giving 6:2
10:10 28:16
47:7 105:5
goal 37:3
Good 4:3
22:12 40:14
41:17, 18 60:18
63:1, 4 82:2
89:7 102:4
104:21
governs 101:3
gradually 124:13
granularity
103:6
Great 7:8 47:9
81:5
greatly 77:7
88:1
green 73:12
117:4
Greenfield
124:23, 24
grind 124:2
groove 55:17
grooves 55:18
ground 5:19
group 21:18
53:25 68:9
91:21 104:8, 18
groups 13:23
14:15 49:13
56:20 57:2, 18
growth 77:2, 4
guess 85:6
119:21
guessing 31:16
guidance 57:6
guides 30:20

guideway 47:14
< H >
hand 22:19
109:24
handover 14:23
79:23 80:3
81:16
hands-on 19:11
happen 28:20
66:23 81:19
118:21
happened 35:17
36:3, 5 43:11
89:12 98:23
101:17 110:4
happening 45:7
happens 82:10
98:23
hard 122:7
head 25:15
55:19 59:17
86:25
heading 70:21
73:2, 15, 24
heads 24:12
headway 112:5
hear 28:16
109:2
heard 46:19
62:15 69:11
70:11 124:8, 23
hearing 4:25
7:9 53:21
hearings 4:16,
23, 24
hearsay 120:2
heater 59:11
heaters 59:7, 17
60:6, 21 74:9
he'd 31:20
Held 1:8
help 14:1
17:16 20:17
29:4, 15 70:25
82:9 94:16
112:5
helped 17:21
94:5, 7
helping 30:23
54:17, 22 56:25
76:14
helps 112:17
hey 124:3

high 37:13
42:4 60:24
123:11
higher 77:6
highlighted
7:25 58:20
highlighting 8:3
hired 93:13, 15
106:25
hires 26:10, 11,
18, 20, 21
hiring 15:6
hit 97:12
hold 41:4
Holder 93:9
honest 43:6
79:12
hopefully 7:11
hoping 32:11
Hopkins 48:14
hour 35:24
95:20
hours 12:8
33:19 113:11
114:17
Hudson 17:19
20:25
hundred 68:10
< I >
i.e 37:8
IC 105:8
ice 59:11
idea 76:7
identical 23:8
identification
84:14 117:3
identified 24:23
25:14 63:17
87:20 96:7
98:11
identify 22:25
36:15 84:15
identifying
84:10
immediate 90:17
immobilised
35:24 70:4, 24
80:11, 18, 20
117:22 118:2
immobilizations
87:20
impact 13:9, 11
16:15, 24 18:14
73:21 114:1, 2

impacted 16:5,
17, 20
impacts 12:1
60:9, 11
impediment
80:16
impediments
16:13
implement 40:25
implementation
47:24 48:24
49:13, 19, 25
52:24 76:15
86:5 93:9
implemented
46:7 54:20
76:1 85:16
implications
104:12 121:9
important 56:2,
3
impressing
76:24
improved 41:14,
15 52:12 69:3,
5, 14 75:12 88:1
improvement
37:21 59:23
74:15 85:10
87:17
improvements
42:7 60:3 69:17
improving 42:20
incident 45:19
82:4
incidents 34:3
36:23 37:20
38:1 39:1, 25
42:23, 25
include 44:24
included 48:20
54:9 115:13
incorporating
35:2
increased 29:13
56:6, 7 58:19
121:22, 23
incriminate 5:20
independent
29:11 53:23
54:5, 11 72:16
91:8 93:6
104:17 105:11,
12 106:1, 16, 18

107:3, 8 115:13
INDEX 3:1, 7
indicating 16:9
indirectly 49:18
individuals 33:5
93:22
industry 21:15
54:15 68:11
76:13 77:12
115:15
inform 14:1
54:18 56:25
76:14 108:10
information 4:9
8:5 13:25
14:12 15:16
16:4 17:10, 12,
13, 22 18:4, 11,
13, 19, 24 19:4,
12 23:25 33:23
34:23 35:1, 6,
18, 20 41:9
44:10, 13, 21
45:8, 11 46:2, 3
49:4, 10, 16, 24
50:2, 3, 9, 17
52:16 53:20, 21
63:2, 19 76:19,
20 77:12 88:24
89:14 94:13, 20
95:22 96:21
99:25 100:6, 21
101:24 105:15,
23 106:7, 20
111:23, 25
112:6, 9, 14, 17,
18, 20
informed 15:7
49:11 86:3
informing 53:10
infrastructure
10:19 60:9, 11
71:12 74:11
ingrained 34:12
initial 26:14, 15
41:9 44:13
45:6 53:1
61:15 72:6
73:19 82:23
92:18 94:5, 7, 8
122:18
initially 16:23
31:12 87:13
Inquiries 5:16
6:4

Inquiry 4:6
5:17, 23 70:11
89:5
instance 5:22
instances 36:13
89:8
insufficient
106:6
integrated 25:19
integration 61:7,
22 62:8, 24
63:7, 12
intended 97:8
102:1 103:2
intends 4:22
intent 113:15,
19 114:19
intention 66:10,
13
intentioned
96:17 97:2
101:22 102:22
interact 69:15
interacted
51:10, 23
interacting
55:23
interaction
45:10
interactions
58:25
interacts 55:8,
13
interchangeably
28:15
interfere 105:4
internal 26:11,
18, 21 31:7
intervene 4:17
interview 4:9,
13, 16, 20, 21
6:8, 14 100:13
109:22 125:12
introduced
10:20 123:14
investigating
36:7
investigation
43:2, 18 44:6
45:7, 18
investigations
35:17, 21 36:3
42:22
invite 40:4

invited 40:7
involve 11:20
involved 9:20,
23, 24 10:14, 20
19:22, 24 20:6,
22, 24 24:15
29:22 34:20
44:16 46:21
54:10, 14, 16
57:2, 4 62:10
93:22 119:13
involvement
8:14 9:5 47:21
92:11
isolate 38:23
isolating 38:12,
14
issue 22:21
28:25 36:25
38:7, 20 40:20
58:14, 17, 20
59:16 65:12
66:16 71:8, 11
75:14 80:25
81:16, 20 83:3,
4, 7 98:6, 11
103:13 104:25
115:20 116:11,
18, 19 117:2, 10
118:17
issued 33:17
52:22
issues 16:3
27:25 28:23
29:15 36:10
39:11, 22 42:9,
12, 15 51:21
52:18, 25 53:9
56:8 58:12, 14,
22, 24 59:2, 3
60:25 63:4
64:2 67:22
69:6, 21 70:7,
13, 19, 23 71:1,
12, 15 72:1, 15
73:8, 11, 21, 22,
25 74:3, 5, 7, 24
75:1, 6, 7, 12, 15,
18, 21, 23 76:8
77:1, 7, 20
78:10, 17, 23, 25
79:2, 16 80:6
81:2, 9, 10, 12
82:8, 24 84:1,
11, 14, 15, 20

85:9, 16, 19
87:10, 19, 21, 23
89:10, 16, 18, 22
90:17, 21, 24
91:15 98:16
108:19 114:10,
11 115:20
116:14 117:2,
18 118:8, 9, 16
125:3
item 39:18, 19
items 39:17
78:7
iterations 94:25

< J >
Jacob 93:12
January 50:16
51:4, 7
Jersey 17:20
Jim 48:14
job 11:23 30:5
jobs 30:5 45:14
Jocelyn 48:11
Joe 58:4
John 11:3 48:9
68:19 103:25
joined 4:6 8:10
joint 49:8 62:21
July 68:24
78:19
jump 24:11
31:18
jumping 27:22
88:11
June 68:24
78:18
junior 73:12

< K >
Kate 2:3 4:4
kept 114:12
115:5
key 40:7
Kim 48:13
kind 27:2
41:21 67:24
88:15 90:13
104:9
knew 18:5 23:4,
7 24:4 63:18
79:20 81:12
85:24 86:21
88:6 108:2, 8
120:22 124:20

Knowing 26:20
119:2
knowledge 45:9
68:12 107:20
121:12
known 125:4

< L >
lack 72:10
101:24
ladder 96:11
Laila 2:17
laptop 39:4
83:1
large 13:2
21:11 47:12
51:16 78:23
largely 14:12
54:9 74:6 75:4
76:1 80:24
larger 23:23
Larry 58:4
68:19 93:7
115:18
late 117:22, 23
Lauch 103:13,
24, 25 110:3, 6,
10
launch 15:22
16:14, 18 21:5
25:5, 8 27:11
47:17, 19 50:25
52:10 54:8, 11,
17, 24 59:7, 13
65:21 69:12
72:6 79:22
80:7 89:12, 13
117:25 119:15
120:11
launched 52:8
78:24 81:21
launches
117:22, 23
launching 51:17
72:21 79:3
120:4
lead 21:5 68:3
122:25
leadership
22:16 23:5
24:19 46:18
47:22 48:15
76:5 77:11
92:3, 8 101:19
104:6 122:19

leading 12:15
44:7 54:10
72:5 74:3
83:16 85:22
89:12, 16
learn 21:7 23:6,
25 39:14 104:2
learned 34:5
37:23 41:25
learning 29:20
30:5 73:13
leave 125:8
led 74:17
85:10, 12 102:2
left 11:5 119:1
legitimate 41:16
length 37:14
42:11 55:16
lesson 41:25
lessons 34:5
37:22
letters 52:22
level 42:4
60:24 63:1, 5
67:22 77:19
103:6 113:17
118:22
levels 28:19
123:11
leveraged 21:14
liability 5:21
life 66:23
lifecycle 56:3
67:15
LIGHT 1:3 4:5
8:15 10:9
121:11
limitations
120:7, 8
limited 38:7
82:17 122:10
lines 22:11
118:22
listing 53:9
lists 30:20
literally 47:11
82:15 83:1
85:5 120:18
live 91:17
LLP 2:10, 12
location 95:18
112:4
locations 20:14,
16 118:5

logic 112:23, 25
113:24 114:24
logistical
121:18 122:3
logs 46:3
long 46:2
longer 37:7
58:2, 8 65:2, 16
121:22
looked 11:20
13:21 22:16
43:2 112:8
looking 12:10
36:9 37:14
46:23 69:18
85:5 88:12
96:13 99:1
100:9 105:10,
17 106:19
108:18 114:3
looks 6:21
37:17
loose 42:6
lost 12:6 34:9
109:23
lot 12:18 17:12,
13 18:23 21:24
59:14 124:18
lots 52:21
loud 124:8
Louis 21:1
Low 23:10
LRT 9:6, 17

< M >
made 5:3, 6
18:3 33:10
45:12 46:5
60:20 71:14
74:9, 10 82:5
92:9 101:1, 11
107:11 115:6
124:5 126:10
magnitude
42:11
main 50:10
51:20, 21 61:16,
17 80:4 117:13
maintain 79:4
118:4
maintainer
36:24 37:17
79:8
maintenance
29:12 51:19
52:2, 7 56:11
58:19 79:25
80:1 81:17, 20
95:23 116:7, 21
117:7
major 15:12
21:10 36:25
42:15 47:16
49:11 59:2
65:9 75:17
78:22, 24 80:15
90:16, 18, 19, 21
98:10
majority 25:22
39:1 40:6
maker 64:4
making 12:18
25:17 54:23
59:25 66:15
77:17 107:10
manage 19:1
57:12
managed 18:20
21:10
management
12:8 24:20
25:2, 10, 12
30:15, 21 34:13
47:10 57:7, 11
92:8 116:8, 10
manager 8:11,
19 9:4, 9 10:13
11:2 48:10
57:6 92:4, 5
93:11
managing 66:21
Manconi 11:3
29:10 48:10
89:21 96:18
101:20 103:24
108:11
manner 15:17
manually 37:9
83:5
matches 123:8
material 13:18
18:18 19:4, 5, 6
35:2, 5
materials 65:25
matter 17:15, 18
18:2 20:13, 15,
20 22:3 54:15
68:5, 14 120:22
Matthew 20:3, 7
93:10, 20
MBTA 21:3
McEwan 48:13
McGrann 2:3
4:3, 4 6:13, 18
7:2, 8, 19, 23
8:7, 13, 18, 21
9:3, 8, 12, 15
10:3, 6, 23 11:8,
13, 18 12:22
13:15, 20 14:18
15:11, 25 16:15
17:2 18:10
19:3, 21 20:12
22:1, 7, 19, 24
24:10 26:1, 19
27:16 28:3
29:2, 18 31:10,
17, 22, 25 32:12,
16 33:8 34:14,
19 35:4, 10
36:9 37:16
39:9, 24 40:9
41:22 42:21
43:7, 15 44:15
45:12, 17 46:5,
10, 23 47:2
48:7, 16, 22
49:3, 15 50:5,
11, 15 51:2, 25
52:15 53:19
54:2, 25 56:2,
16 57:21 58:11,
21 59:18 60:10
61:2, 11, 20
62:4, 20 63:6
64:19 65:13
66:2, 9, 25
67:19 68:14, 23
69:20 70:22
71:17, 23 72:23
73:23 74:22
76:7 77:14
78:17 79:13
80:18 81:8, 23
82:9 83:16, 24
84:4, 25 85:14
86:19 87:8, 19
88:18 89:18, 24
90:5, 10 91:13,
21 92:10, 20
93:4, 21 94:11
95:2, 10 96:10
97:6, 11, 16, 20,
25 98:19 99:12,
24 100:3, 12, 18,
25 101:10, 13
102:11, 16
103:9, 16, 19
104:2, 9 105:7,
16 106:10, 15
107:7, 19 108:4,
18 109:1, 9, 21
110:1, 12 111:6,
9, 18 112:24
115:1, 17, 19
117:17 118:9,
25 119:17, 23
121:4 122:20
125:7
means 19:16
34:1 38:13
meant 8:1 61:1
measured 85:2
measurements
36:12 105:2
mechanism
24:25 59:12
meet 102:7
104:19 111:24
112:19
MEETING 1:3
49:8 104:7
meetings 40:13
46:20 47:18, 19
49:7, 9, 22
50:15, 17 53:23
57:4, 20
Member 2:3, 4
4:7 48:7 92:15
93:4
members 19:9
21:6 49:16
53:24 54:9
57:19
memorandum
63:10
memory 54:7,
13 87:6 89:15
109:19 110:1, 5
memos 33:16
mentioned
15:25 20:2
30:6 35:10
47:5, 23 52:1
54:16 57:9, 11
58:11, 23, 24, 25
65:10 70:22, 23
73:1 76:12
79:19 81:18
82:25 84:17
86:10 90:15
91:1, 13 104:16
112:2, 3 115:19
mentioning
32:22 96:22
mentor 30:25
mentors 31:8
message 122:7
met 25:11 53:3,
6 74:19 91:4
92:12 95:15
104:22 105:13,
24 106:4, 12
metric 36:20
115:10
metrics 91:3
Michael 46:22
47:23 48:12
50:8 53:8
56:23 58:2, 8
76:16 88:25
microphone
7:13
middle 101:6
midway 108:1
milestone 72:25
milestones 15:3
mind 10:9
88:10 121:19
mindset 110:23
minimal 38:18
minor 73:22
79:1 82:13
114:9 117:11
minutes 37:5
119:1
missed 94:1, 9
missing 72:10
mitigated 18:20
mitigations
36:6 74:7
MMTP 24:21
25:6
model 21:11, 12
22:13, 25 24:21
25:7, 20 31:2
32:24 33:4, 7
modifications
60:20
moment 10:4
Monday 124:2
monitored
111:20

<p>monitoring 14:8 29:13 36:18 monthly 47:18 months 53:20 60:19, 23 70:16 92:22 93:1, 2 Morgan 46:22 47:6, 23 48:13 50:8 53:8 56:23 68:21 71:22 88:25 Morgan's 76:16 morning 52:10 80:7 81:21 123:9 motion 80:22 move 37:10 53:19 59:18, 20 74:20 77:21, 24 78:18 83:14 90:2, 6 95:20 98:25 99:11 104:18 111:1 moved 37:2 84:2 movement 26:15 movements 61:16 62:2 moves 61:15 80:1 moving 16:14 39:8 72:19 76:22 80:23 90:18 109:1 MSF 81:17 multi 21:11 24:21 25:6, 20 multiple 59:8 102:7 114:6</p> <p>< N > named 20:13 names 68:18, 21 nature 65:19, 22 119:16 120:17 near 44:22 nearby 44:25 necessarily 66:18 necessary 39:5 83:13 needed 6:16 12:15 13:25 14:6, 10, 22 15:5, 23 18:11</p>	<p>27:25 37:6 51:17, 18 52:8 77:24 87:16 88:8 91:8, 9 99:21 113:12 125:6 needing 121:10 needs 7:7 17:13 36:16 37:8 NEESON 126:20 network 12:2, 3 25:20, 23 120:19, 20 new 11:2, 6 17:20 28:12, 13 67:14 70:15 73:6, 7, 9, 10 75:18, 19, 25 86:18 101:8 nightmare 121:18 122:3 non-derailment 36:10 non-functioning 113:10, 12, 21 non- typographical 5:13 normal 28:19 67:3, 23 70:14 73:16 74:1, 25 77:2 North 58:4 68:19 noted 3:3 notes 126:14 noticed 31:19 notification 39:20 notifications 14:9 number 13:7 15:1 20:13 21:17 25:14 27:25 31:14, 16 32:3, 5 33:15 37:13 38:9, 17 39:5 42:8 51:16 56:24 57:1 67:7, 9 72:9 75:6, 20 78:14, 23 79:20 80:5, 24 82:8, 17 85:19, 20</p>	<p>86:2 89:8 95:16, 17 107:4 112:3 120:5 NUMBER/DESCR IPTION 3:9 numbers 81:2 numerous 123:4</p> <p>< O > object 6:5 objected 5:18 objections 126:10 objectives 104:19 observed 45:20 observing 64:2 obstructed 80:22 obtain 4:14 OC 8:23 9:2 13:4, 10 14:20, 23 16:5, 15 17:14 19:13, 23 22:9 25:19, 25 27:13 29:3 34:18 35:12 37:19, 24 39:19, 25 43:9, 19 48:15, 18 57:16 61:6, 9, 19, 20 62:22 63:6 123:16 occupancy 71:6 occur 38:1 42:9 81:11, 22, 24 82:24 83:18, 19 85:22 86:7 occurred 90:20 104:7 occurrence 43:24 70:3 occurrences 37:13 38:22 70:6 78:15 83:25 85:6 88:12, 16 118:2, 18 occurring 69:13 75:6 81:3 occurs 36:25 37:1 82:10 o'clock 124:4, 14</p>	<p>odd 24:23 25:15 offer 124:7 office 47:24, 25 48:21, 23, 24 49:13, 19, 25 52:24 56:24 57:17 76:16 86:5 93:9 officer 45:4 48:14 OLRT 25:10 26:12 28:14 31:3 33:1 49:9, 12 50:9, 10, 14 53:5 93:11, 19 119:4 OLRTC 49:21 50:11 52:16 ones 34:22 35:15 78:11 79:9 83:8, 10 91:22 92:17 one's 58:7 76:14 ongoing 14:15 36:12, 17 59:24 62:11 66:10 70:23 72:25 86:9 117:10 onwards 96:12 open 122:9 124:3, 12, 13 opened 15:19 112:11 121:16, 17 opening 15:18 82:15 90:7 91:24 119:5, 7 120:13, 14, 23, 25 121:1, 3, 5, 15 122:15, 21 123:2, 5, 23 124:3, 6, 19 operate 12:21 14:5 52:6 65:7 operating 12:3, 22 13:3, 6, 12, 16 14:2, 17 17:22 19:24 24:16 28:5 30:2, 17 45:13 67:17 75:13 operation 22:11, 14 23:1 26:7</p>	<p>28:12, 17 29:22 33:11 40:23 41:24 42:1 73:6, 7, 18 80:17 124:24 operational 9:20 26:24 28:4 33:16 34:3 35:10 36:10 37:24 38:3 39:15 40:20, 25 41:23 42:24 45:21 62:25 112:13 124:5 operationalising 9:23 operationalizatio n 10:21 Operations 8:10, 19, 23 9:1, 4, 9, 21 11:10, 14, 19 12:5, 24 18:15 23:18 24:13 27:18 40:22 44:17 46:6 57:9 operator 26:23 30:1 35:18 38:15, 22, 24 45:24 61:8 80:3 operators 23:21 29:6 32:23 33:6, 14, 19 38:18 39:6, 10 44:24 82:14 83:8 operator's 33:22 opinion 53:11 64:23 65:3 72:18 76:1 77:10 105:12 106:2 123:3 opportunities 25:1 opportunity 5:9 41:8 65:24 opposed 96:25 120:13 123:7 option 98:1 121:8 options 95:12 97:13 98:25 order 4:25 14:23 37:9 47:16 77:21</p>
--	--	---	---	--

<p>90:1 92:13 114:15 116:8, 9 orders 116:24 organization 13:2, 13 20:21 23:24 57:16 organizations 23:17 48:25 organize 40:3 organized 39:13 original 32:7, 18 originally 15:20 32:4 64:21 65:16, 20 108:20 ORT 14:1 16:24 82:19 OTTAWA 1:3, 4 4:5 8:14 22:12 Ottawa's 9:6, 17 10:9 outlined 66:18 96:22 97:4 112:21 outlines 87:2 outset 14:18 66:10 outside 37:8 outstanding 72:2 78:10 103:14 110:7 overall 12:24 20:8 66:13 69:15 99:3 overarch 13:8, 13 overcome 82:11 overhead 55:4, 6, 21 oversee 47:4 overseeing 48:1 overshadowed 42:13 oversight 29:14 46:13, 21 overtax 124:10</p> <p>< P > p.m 1:10 4:1 125:15 packaging 11:6 PAGE/LINE 3:9 pages 3:4 panel 82:16</p>	<p>pantograph 55:9, 15, 19, 24 56:1 pantographs 56:7 paper 115:9 parallel 124:16 part 7:17 30:18 37:16 44:5, 12 45:6 46:18 52:18 53:1 55:23 74:1, 25 77:2, 16 78:2 86:9 93:7, 12, 17, 19 94:6 98:6 99:3 101:10 102:18 104:17 105:1 107:7, 9, 16 111:16 113:2 115:22 partial 120:13, 23 121:10, 14 122:14 PARTICIPANT 2:6 participants 1:9 5:7, 12 41:20 57:18 participate 40:4, 6, 7 49:9 participated 46:20 particular 8:1 18:12 31:9 39:13 80:19 parties 41:10, 15 97:2 120:21 124:20 partner 31:13 32:8, 19 34:20 40:2, 8, 13 67:20 Partners 20:22 21:25 22:5 68:16, 17 93:8 partnership 40:12 41:19 pass 64:8 88:4 91:6 93:23 95:10, 14 96:2, 3, 12 97:4 99:4 111:5, 7, 15 112:22 115:11 passed 88:9 92:13 95:17</p>	<p>passenger 88:7 108:14 passengers 57:14 95:20 passing 112:4 Pat 48:12 pause 43:12 61:5 95:9, 11 96:8, 14 97:13 98:1, 11, 20, 22, 25 117:13 paused 98:24 99:2 peak 102:8 123:7, 9 Peddle 2:4 4:7 88:10 people 11:14, 25 12:18 15:7 18:25 20:23 30:2, 18 31:6 34:7 57:1 58:8 62:4 84:7 86:6 91:22 111:22 121:21 124:10, 14 percent 109:20 113:8 perfect 69:5 75:22, 25 88:2 110:21 111:3 perfection 76:25 118:21 perfectly 55:14 perform 38:11 performance 39:12 52:12 60:25 61:4 67:18 69:3, 6, 14, 23 71:24 75:12 95:8 111:19 112:1 115:4 118:23 performed 10:24 61:19 88:23 performing 59:20 68:25 period 9:19 12:17 13:24 17:8, 11 19:7, 18 29:21 51:15 52:10, 14 59:21 64:10, 11 65:16 68:25 69:24</p>	<p>70:12 73:1, 2, 3, 5, 15, 25 74:25 75:3 76:10 77:15 79:17 81:25 83:16 88:5, 6 94:2 96:9, 20 97:18, 21 102:12, 18 114:21 115:21 118:24 119:9 123:8, 9, 16, 19 periods 18:24 61:10 73:20 75:14 82:4 perjury 6:2 permissible 77:19 78:15 permits 4:18 person 5:22 34:9 93:18 94:9 116:12, 13 perspective 7:10 8:22 42:17 43:10 46:12 47:22 56:11 62:6 63:8 69:1 91:16 98:10 117:5 120:12 121:2 122:17 Peter 2:9 31:19 53:18 72:8 96:21 100:3 109:2 phase 63:12 66:4 69:1 71:3 74:1 75:3 77:16, 22 Philadelphia 17:19 21:10 phone-a-friend 27:2 phonetic 58:4 pick 109:22 123:20 picking 61:18 piece 112:16 115:9 117:8 pieces 16:1 111:22 place 6:1 12:5, 12, 15, 20, 25 24:14 36:7 91:12 96:16</p>	<p>98:8 109:10, 11 119:19 126:6 placed 91:16 placement 57:17 places 55:11 67:13 124:9 plan 85:17 planned 19:8 85:21, 22 124:22 planning 9:20 10:21 platform 79:23 80:3 play 41:24 105:8 playbooks 30:21 57:11 played 95:12 players 19:25 playing 106:17 plug 39:3 83:1 point 6:13 9:15, 19 15:23 29:2, 9, 19 36:24 37:11 56:18 58:6 70:13 74:21 76:2 85:8 88:19 90:10 91:17 93:13 96:7 100:25 102:3 105:20 119:4 points 23:2 popping 108:2 114:13 pops 59:16 populate 52:9 69:12 79:21 populating 117:25 portion 30:5 79:6 position 10:13 111:10 positioned 56:17 positions 8:8 11:25 12:19 positively 69:18 possibility 30:1 possible 23:7 26:11 37:2 Possibly 118:12 120:8</p>
---	---	---	--	---

<p>post 54:8 85:23, 25 86:20, 22 123:14 posted 5:1 post-revenue 87:5 post-substantial 86:8 87:4 potential 52:17 58:20 Potentially 35:9 83:21 96:15 98:23 103:10 120:6 power 55:4, 6, 7, 8, 21, 22 practical 121:9 practice 21:20 27:16 117:7 practices 12:4, 9, 11 13:8 17:23 19:15 22:9 23:2 95:23 116:7, 21 pre 86:7 preliminary 44:13 45:6 Prendergast 58:5 68:20 preparation 46:13 preparations 17:4, 5 preparatory 14:21 prepare 13:18 16:5, 19 17:3 18:15 28:19, 20 preparing 11:13, 19 17:16 57:9 102:18 PRESENT 2:14 31:21 81:13 presented 49:14, 24 76:19 presenting 58:13 pressure 123:4 pre-substantial 87:3 pretty 30:9, 11 107:1 prevent 36:5 80:8 84:11 prevented 51:17</p>	<p>preventing 72:19 78:23 80:16, 23 prevents 59:11 previous 26:4 95:8 111:25 112:19 115:5 previously 96:23 102:2 103:3, 8 110:8 primarily 26:17 58:7 primary 10:14 71:11 87:15 principles 12:9 prior 20:17 51:18 59:7 61:11 76:8 85:23 91:10 92:22 93:13 115:21 117:25 123:19 private 31:13 32:8, 19 34:19 40:2 proactive 84:10 problem 32:5 procedural 4:24 procedure 94:18, 23 95:3 96:16 97:8 98:8 100:20 101:2, 15, 23 102:19 103:11 104:3, 13 105:9 107:21 108:6 113:4 procedures 12:4, 7, 11, 20, 23 13:3, 6, 7, 12, 16 14:2, 17 17:23 45:13 92:24 proceed 77:17 78:8 96:13 98:12 proceeding 72:14 proceedings 5:21, 25 126:5 process 41:2, 14 46:4 64:6, 16 65:1 67:23 72:21 76:13 84:14 91:7</p>	<p>103:4 104:17 110:24 115:14 119:21 processes 12:4, 11 64:3 procuring 11:10 produced 92:25 production 107:4 proficient 31:6 program 8:11 10:18 14:14 15:1 24:20, 22 25:7, 10, 12 32:2 47:11, 25 52:23 76:18 78:2 89:1 93:16 programs 34:2 progress 49:17 54:3 progressing 49:5 63:20 progressive 124:19 project 9:22 13:18 18:5, 8 20:5, 8, 9, 10 24:24 25:3, 13 47:14 63:9, 13 86:16 93:10 101:25 102:13 109:6 113:18 123:10 projects 20:16 22:8 24:23 25:16 65:9 67:1 prong 120:15 properly 16:3 29:25 38:14 properties 21:7, 8, 19, 23 23:6 24:2, 7 66:14 68:2, 7, 13 property 22:18 23:8 prosecution 6:2 provide 4:8 6:19 27:9, 25 33:2, 5, 14 58:3 63:14 68:22 72:18 105:22 106:2 118:16 provided 19:19 27:17 30:6 32:1, 25 33:9</p>	<p>34:15 35:6 48:3 49:4 68:19 74:12 76:20 107:2 provides 5:16 providing 28:4 34:23 35:1 56:19 57:5 62:5 105:12 proxy 22:12 Public 4:6, 15, 23 5:2, 16 6:4 40:10 66:6 89:5 90:6, 7 91:25 96:18 119:5, 7, 9 publicly 108:12 120:19 pull 90:20 109:17 pulled 112:8 pulling 44:10 purpose 4:9, 13 102:12, 17 purposes 29:19 105:18 Pursuant 5:15 push 18:6 pushing 91:19 put 12:15 14:20 17:22 19:12 36:6 47:12 64:9 91:11 98:8 108:21 121:21 122:24 125:2 126:7 putting 22:19 64:8 100:20 < Q > qualitative 85:7 116:5, 22 117:9 quality 40:11 46:24 85:1 quantify 70:2 question 5:18 6:24 26:2 30:24 32:3, 6 35:11 43:6 44:16 74:23 79:12 98:14 102:21 106:11 108:3, 4 116:4</p>	<p>questions 4:12, 18, 19 6:6, 11 22:2 61:3 109:22 125:8 questions/reques ts 3:3 quick 83:9 101:17 quicker 29:16 quickly 6:23 37:2 38:20 quite 74:23 75:2 115:2 < R > radio 41:4, 6 46:3 RAIL 1:3 4:5 8:15 9:21, 25 10:9, 14, 18 12:2, 12 13:6, 11, 14, 16 14:8, 13 15:1 23:17 24:20 25:9, 12, 18, 23 30:17 32:25 33:6 44:24 47:10, 24, 25 48:20, 22, 23 49:13, 19, 25 52:23 57:17 68:10 73:17, 18 76:15 86:5 88:25 93:9 118:22 120:20 121:11 122:1 124:25 raise 103:17 107:19 108:5 raised 71:24 72:9 103:13, 19 106:8 110:7, 9 RAMP 25:11 29:21 46:20 47:5, 10 48:8 49:4, 7, 16, 22 50:1, 17 53:23 57:4, 20 76:18 78:2 89:22 104:7 ramping 119:9 randomly 116:23 ranks 26:18 30:15</p>
---	--	---	--	--

<p>rationale 53:1 76:2 112:23, 25 113:24 114:25 Rea 2:16 126:3, 21 reach 21:14, 22 reached 21:18 22:8, 17 23:16 24:6 103:24 reaching 62:13 67:19 68:1 react 38:21 reaction 85:1 reactions 36:18 37:20 85:1 read 41:10 readiness 57:23 89:25 106:4 ready 14:23 25:17 50:23 54:24 77:24 79:10 85:12 108:14 122:8, 15 real 27:2 60:19 89:7 101:23 102:23 122:2 really 19:14 27:21 29:20 36:21, 23 56:22 59:16 71:10 83:7 101:24 110:25 122:7 reason 38:13 reasonable 114:5 reasonableness 114:25 reasons 117:13 121:8 reassess 98:12 recall 63:3 65:11 67:25 87:14 88:17 91:20 93:18 receivable 5:24 receive 16:6 18:13 52:15 received 6:20 19:6 32:7, 17 receiving 50:5, 18 recognition 79:7 96:6 recognize 6:25 7:14</p>	<p>Recognizing 38:4 75:18 124:20 recollection 51:12 54:7 87:24 103:12 recommendation 92:2, 7 recommendation s 39:22 recommended 102:9 record 6:15 10:3, 5 22:21, 23 31:23, 24 32:13, 15 43:13, 14 53:13 recorded 115:7, 9 126:11 records 115:5 recover 37:15 83:9 recruitment 11:24 rectification 38:7 117:3 118:18 rectified 113:11, 12 114:16 116:13 rectify 40:21 116:18 recurrences 78:20 recurring 84:12 red 7:25 90:17, 23 reduce 70:19 77:8 85:18 123:4 reduced 82:2 118:6, 7 120:5, 6 123:12 reducing 37:15 75:15 reduction 42:8 75:5, 7, 11 81:6, 9 82:7 84:19, 22, 23 85:8 redundant 113:13, 22 114:7 refer 78:5 89:13, 14 reference 8:22 23:2 46:19</p>	<p>67:1, 20 69:11 100:19 referred 20:12 100:7 107:17 referring 48:17 53:14, 25 88:21 99:13 109:10 refers 107:4 refine 41:13 refinement 40:18 41:22 reflection 7:17 refresh 109:18 refresher 33:18, 20 34:2, 14, 16, 20 regard 21:25 26:16 36:20 63:4 65:5 68:3 114:6 regardless 36:24 37:1 regards 50:2 51:8 54:18 60:25 74:5, 8 82:6 95:22 116:15 120:1 regular 34:11 related 9:16 10:8 39:23 81:3 117:16 relationship 13:21 release 37:9 relevant 8:9 45:9, 11 reliability 42:7, 17 50:6, 18, 22 51:3, 4, 8 54:20 56:4, 12 57:23 59:15 60:3, 18 69:1, 23 71:1, 11 72:1, 25 74:15 75:1 77:4, 20 78:17 79:14, 16, 18 80:13 81:5, 12 83:25 85:9, 19 87:10, 23, 25 89:19 90:24 91:14, 15, 16 113:7, 8 116:3 117:16, 18 118:23 125:6</p>	<p>reliable 80:16 82:2 89:7 118:16 relying 25:21 68:11 remained 87:10 remember 32:5 99:19 117:19 119:23 remembering 117:14 reminder 39:21 remotely 1:9 remove 36:17 70:6 83:21 reorganized 11:3 repeat 117:15 118:18 replaced 120:19 report 107:3 reported 49:19, 20 59:6 69:22 116:12 reporter 46:24 126:4 REPORTER'S 126:1 reporting 24:24 25:9 126:20 reports 50:6 88:14, 24 representative 75:1 76:9 representatives 21:13 32:8, 18 40:2, 13 49:21 63:25 67:2, 20 68:15 request 94:19 96:21 99:25 100:6 requests 28:8 29:4 require 7:15 33:24 39:2 75:2 82:24 83:10, 20 90:13 required 6:3 31:3 33:2 47:16 80:12 82:11 90:3, 8 109:13 requirement 63:14 123:9</p>	<p>requirements 14:6 15:8 16:12 53:6 74:19 77:23 93:22 94:12 96:23 99:16 109:11 requiring 70:25 reset 37:6 99:7 resets 38:11 resetting 82:16 83:5 resided 20:15 resolution 29:16 resolve 82:15 84:16 resolved 71:16 79:2 resource 26:6, 24 28:17, 21 30:4, 6 resources 18:25 24:14, 25 25:4, 13 29:3 respect 6:8 11:8, 10, 13 13:15 15:11 16:2 18:10 19:3 22:7 24:10, 13 26:3 28:3 31:10 33:8, 10 34:14 35:12 39:9 42:21 43:2, 16 45:17 54:3 58:21 62:23 72:3 84:25 85:14 91:14 92:10 97:23 122:20 respond 13:10, 11 14:10 27:4 28:7 36:22 38:21 responded 53:7, 8 responding 34:9 response 36:13, 22 37:12 responses 14:17 37:25 responsibilities 11:7 95:4 responsibility 10:17</p>
--	---	--	---	--

<p>responsible 63:24 79:9 rest 64:15 restart 95:9, 11 96:5, 8, 14 97:13, 16, 20, 22, 24 99:5, 10 restarting 97:17 111:10 result 19:7 45:14 56:8 58:18 60:22 65:14 74:20 75:4 92:25 110:13 113:14 resulted 71:8 118:3 results 56:6 Resume 3:10 6:20 7:3, 6, 14, 22, 25 8:6 resurface 52:13 retained 39:19 46:2 retraining 46:6 retrieve 70:25 retrofit 66:17 retrofits 33:10 66:3, 10, 22 67:7, 9 86:2 retrofitting 67:3 revenue 16:9 27:10 46:14 49:6 53:2, 6, 15 61:12 66:5 85:23, 25 86:22 89:17 90:2 91:10, 23 99:16 104:22 106:12, 21 122:25 123:15 review 5:10 35:4 44:5 72:17 92:16, 17, 21, 24 94:7, 15 95:4, 7 97:1 99:23 100:19 101:23 102:9, 17 103:22 104:10, 11 108:22 109:17 111:24, 25 112:18, 19 113:4, 19 115:2, 3 118:14</p>	<p>reviewed 17:14 100:24 reviewing 17:9 revising 95:3 Reynolds 2:9, 11 RFI 102:2 105:17 RFIO 96:20 99:24 100:8, 19 101:3, 15 103:11 104:4, 14 105:9, 17, 20 106:19 107:22 108:6 109:19 110:4 115:22 118:13 RFIO266 107:6 RFI-O-266 104:25 rhythm 40:23, 24 Richard 93:9 ridership 123:8, 11 125:1 rightfully 42:14 rigid 64:6 RIO 53:21 RLT 14:14 robust 113:6 role 8:13 9:3, 21 10:24 11:6 38:4, 7 45:1 47:25 61:6, 20 63:7, 9, 17 64:14 105:7, 16 106:17 roles 32:9, 19 roll 81:4 rolling 61:6, 21 room 29:6 37:21 62:18 90:1, 6 root 29:15 36:4, 7 83:2 84:11, 15 routes 57:14 121:21 RTG 13:17 14:1 16:8, 24 18:11 19:12, 21 20:1 25:10 28:13 31:3 33:1 35:19 38:10 39:23 44:10 48:6</p>	<p>49:4, 8, 12, 17, 21 50:1, 10, 14, 19 52:16 53:5, 22 62:7 70:18 79:4 103:13 RTG's 47:4 62:23 72:6 RTM 39:18 40:4 41:19 44:10 79:4, 7, 25 81:1 93:12 117:5 run 8:7 12:5, 21 15:4 16:25 17:3 25:17 35:12 82:3 121:10 running 12:13, 17 15:10 16:11, 21 68:24 69:24 70:17 71:3 72:14 74:4, 21 76:9 77:22, 25 78:8 79:17 81:7, 25 83:17 84:7, 21 85:13 86:15 87:9, 17, 18, 22 88:4, 5 89:17 91:7 92:11, 14, 16, 17, 19, 21, 23, 24 93:3, 14, 23 94:6, 14, 15, 18, 21, 22 95:3, 4, 7, 13 96:8, 20, 24 97:1, 5, 8, 18, 21 99:4, 19, 20 100:18, 20 101:1, 2, 4, 11, 14, 23, 25 102:5, 9, 12, 16, 17, 19 103:11, 22 104:3, 10, 11, 13 105:1, 9 106:13 107:5, 6, 15, 16, 21 108:6, 22 109:12, 17 110:16, 18, 20, 22 111:19, 24 112:18 113:3, 19 115:2, 21 118:8, 14, 20 121:24 Russell 94:4</p>	<p>< S > safe 78:12 80:16 safety 12:7 34:12 45:4 47:15 48:13 64:6 72:2, 9, 17, 20, 23 75:17 78:25 90:16 91:9 98:10 113:21 114:22 scada 14:7 scale 123:5 scene 44:11 45:4 schedule 14:20 15:12, 13, 15 16:4 25:13 85:17 90:14 scope 25:3 scorecard 115:8 screen 108:3 Scrimgeour 48:12 scroll 6:23 scrolled 6:22 Section 5:15, 16 6:3, 6 security 113:22 114:2 seeking 67:24 selecting 116:23 selection 11:24 send 41:9 senior 25:10 92:8 separate 25:3 63:10 SEPTA 21:12 September 35:14 65:21 119:5 sequence 80:7 series 24:22 64:7 77:23 94:20 102:23 service 12:8 13:4, 5 15:22 16:10, 14 27:2, 10, 11 38:16 40:11 46:15 47:17 49:6 50:24 51:1 53:2, 6, 15 56:4</p>	<p>57:24 59:13 61:12 66:5, 6 67:6, 11 72:22 77:20 78:9, 10, 12 80:2, 5, 9, 17 81:17 82:3 85:24, 25 86:23 87:5 88:7, 23 89:3, 5, 7, 17, 19 90:2, 6, 22 91:10, 23, 25 99:16 102:5 104:22 106:4, 12, 21 108:15, 20 114:1 118:4, 6, 16 119:6, 7, 8, 9 121:10 122:25 123:8, 15 124:7, 9, 16, 17 services 22:11 48:20 session 111:13 sessions 49:14 set 11:15 24:7, 8 58:14 94:12 105:21 113:7, 8 126:6 setting 14:22 93:22 shadow 26:23 30:1 shape 61:3 shared 5:6, 11 sharing 63:2 shooting 30:20 shop 76:16 short 18:24 shorter 17:7 42:12 Shorthand 126:4, 14 show 42:19 102:7 103:1 113:5 showing 6:20 side 9:25 10:14 13:17 20:1 29:4 49:17 50:13 58:10 62:23 87:15 sign 91:8, 9 signed 115:10, 12</p>
--	--	---	--	---

<p>similar 39:3 44:15 76:6 simple 12:6 21:21 37:5 99:2 simplify 122:11 simply 107:15 single 40:5 Singleton 2:9, 11 sit 30:25 site 28:2 44:14, 22 sitting 56:19 situation 27:3, 4 situations 39:6 82:18 114:8 size 12:1 18:5 73:7 skill 24:7 Slade 20:3, 7 93:10, 20 110:10 slate 97:22, 24 slightly 26:20 35:20 slowly 124:14 small 39:5 smaller 67:8, 9 snow 59:11 soft 119:15 120:11, 13 121:1, 3, 5 122:20 123:2 soften 124:19 software 33:11 60:1 64:2, 8, 12 66:15 69:7 74:7 75:9 82:6 84:17 85:15, 17 sole 77:9, 10 solemn 4:14 somebody 10:24 27:3 SOP's 57:10 sorry 28:14 43:6 53:17 109:2 sort 29:20 31:7 36:11, 13, 17 44:12 45:10, 25 51:13 60:24 64:18 66:18, 21 77:4 90:17, 19, 21 91:3 92:6 96:11 110:25</p>	<p>112:20 117:4 125:4 sounds 49:15 108:25 source 63:19 sources 49:3, 17 speak 7:13 21:22 76:4 81:2 103:22 104:25 121:13 speaking 29:19 42:10 50:3 62:14, 18 66:13 67:12 92:5 94:22 123:21 speaks 109:7 specific 13:4, 6, 14, 16 16:1 19:2 24:24 25:16 26:2 30:13, 14 45:3 51:7 58:17 63:16, 17 78:16 82:22 91:3 95:15, 18 105:1 106:24 107:23 108:7, 8 112:4 113:14 122:24 specifically 45:3 57:21 58:12 71:25 89:9 117:17 specificity 91:15 specifics 116:20 speed 34:7 spider 114:11, 12 115:20 spiderweb 114:16 spine 120:19 spoke 21:12 65:13 88:11 96:18 spreadsheets 15:2 spring 59:19 61:4 67:21 68:1 St 21:1 stabilize 28:18 staff 8:10 14:6 15:4, 23 18:1 19:9, 19, 23 21:6, 18 26:13, 16, 17 27:8, 12, 13, 15 28:1, 24</p>	<p>30:4, 11, 23, 24 31:3, 4, 5 33:21 34:1, 17, 18 37:25 38:4, 5 39:20, 21 44:16 45:9, 10, 13, 21 61:19 62:22 65:23 112:2 123:18 staffed 18:8 staffing 28:19 staff's 36:13 37:20 stage 8:14 9:5, 16, 20 10:8 67:23 89:5 119:4 stages 66:11 stagger 54:19, 25 55:20, 24 58:11 stairwells 121:16 stand 22:12 standalone 25:24 standard 12:3, 22 13:3 14:16 standardizing 37:12 standing 89:24 stands 100:1, 4, 15 start 9:24 16:20 28:17 31:12 40:10 51:2 73:19, 22 74:4 80:5 87:18 90:22 99:8 107:24 109:11 110:14, 24 started 4:11 6:18 10:8, 13, 19, 20 11:16 28:23 87:10 101:8 103:9, 15 starting 24:13 46:15 73:6 85:13 119:8, 17 123:20 starts 11:23 41:3 startup 28:12, 16</p>	<p>stated 87:13 106:18 107:6 statement 43:25 45:24 States 24:2 station 30:21 44:7 57:11 83:15 96:1 120:7 121:15 stations 57:13, 15 71:5 112:11 121:16, 17 122:14 stats 70:1 88:20, 21 status 47:13 49:11 Stenographer/Tra nscriptionist 2:16 stenographically 126:11 step 37:19 41:3 stepped 10:25 steps 39:5 43:8, 19 44:17 45:19 64:7, 18 92:6 101:21 123:4, 6 124:19 stick 121:6 sticking 28:5 stock 61:6, 21 stop 90:18, 23 stopped 91:5 storage 51:19 52:7 79:25 81:20 straight 55:14, 22 stretches 89:7 strip 55:16, 25 strong 89:7 struck 92:21 structure 25:9 stuff 125:4 subcontract 26:13 subject 17:15, 17 18:2 20:12, 15, 19 22:2 54:15 63:10 66:3 68:5, 14 submission 117:3</p>	<p>submissions 16:8 72:7 submit 114:15 subsequent 123:12 subside 73:22 subsidiaries 18:12 subsidiary 53:22 substantial 46:14 48:5 49:5 53:14 61:12 66:5 72:7, 8, 13, 24 74:4, 18 79:6 81:7 85:12, 23 86:1, 20 105:13, 23 successful 27:18 92:18 successfully 92:13 sufficient 105:15, 22 106:20 114:4 sugarcoat 69:4, 21 suggested 110:3 122:21 suite 13:5 17:25 summer 59:19 60:7, 23 61:4 67:21 68:1, 23 71:20 72:4 supervisor 44:25 45:5 supervisors 38:6 supplied 49:10 112:7 supplying 50:3 support 8:10 24:14 27:7, 13, 15, 17 28:1, 4, 8 29:4 31:8 85:2 112:17 120:16 supported 31:8 48:4 76:22 93:7 102:9 115:15 supporting 58:9 76:17 surfaced 123:1 surprises 50:2</p>
---	--	--	--	---

<p>switch 59:7, 10, 12, 17 60:6, 15, 21 74:9 82:17 101:2 102:10 104:3 107:10</p> <p>switches 59:7, 8, 17 60:6, 13, 17 61:1 71:13, 18 74:8</p> <p>switching 101:14 103:10 104:13 105:8 107:21 108:5</p> <p>SWORN 4:2</p> <p>System 8:15 10:9 14:4, 7, 24 16:2, 6, 13, 16, 18, 25 19:24 23:8, 10, 19, 22 24:4 29:22 30:3, 14 32:1 34:13, 24 36:11 41:25 42:8 44:3 46:14 51:11, 24 54:4, 20, 24 55:3, 4, 5 58:25 59:19 60:2, 4 61:3 62:1, 3 63:25 64:4, 5, 17 69:8, 15 70:15 72:3 74:21 75:19, 22, 23, 24, 25 77:4 90:7 92:13 95:25 104:20 108:14 114:21 116:8, 10, 25 117:1 120:4, 8 121:11, 25 122:8, 9 124:11, 13</p> <p>systems 23:1 25:2 38:11 73:10, 14 75:9 82:21 102:24 103:1 112:9 122:13</p> <p>< T ></p> <p>takes 36:15 37:7</p> <p>talk 70:11 77:3 121:4</p> <p>talked 57:4 75:16 99:15, 18</p>	<p>103:4 104:8 117:24</p> <p>talking 10:7 22:24 26:19, 22 31:25 32:16 52:24 58:12 71:17 72:1 105:19 107:14 114:3 117:14 121:14</p> <p>talks 109:7</p> <p>Talus 63:24 64:4</p> <p>targets 113:7</p> <p>task 11:15</p> <p>tasks 11:15</p> <p>team 4:7 22:16 23:5 24:19 29:11 46:18 47:22 48:15 53:24 54:6, 12 57:7 76:5 77:11 92:3, 8, 16, 17, 21 93:5 94:7 95:5 97:1 100:19 101:19 102:9, 17 103:22 104:6, 10, 12 107:5, 9 108:22 111:24 112:19 113:19 115:2 118:14 122:19</p> <p>teams 63:2 75:19</p> <p>tear 56:6</p> <p>TECHNICAL 10:2 32:14 39:7</p> <p>Technician 2:17 37:6, 8 39:2 70:5, 25 80:12 82:25 83:10, 12, 20</p> <p>technicians 27:7, 14, 17 30:7 31:9 44:11 62:12 63:23 64:10 84:9</p> <p>telephone 34:10</p> <p>telephones 72:11, 12</p> <p>tend 5:19, 20 42:6 81:3 89:10</p> <p>tending 69:12</p>	<p>term 29:12 40:17 54:11 70:11 99:6 119:15 124:23</p> <p>terminology 8:22</p> <p>terminus 83:15</p> <p>terms 12:2 37:25 40:11 69:23 75:8 83:5 88:13 96:23 106:24 121:24</p> <p>test 12:20 60:19 94:18, 22 95:3 97:8 100:20 101:2, 14 102:19 103:11 104:3, 13 105:9 107:21, 24 108:6 109:10 110:1</p> <p>testify 104:1</p> <p>testimony 126:9</p> <p>testing 12:16 15:9 61:7, 21 62:8, 23 63:7, 11 64:21 65:1, 15 66:4 71:18 93:14 94:3</p> <p>tests 64:14 72:10 77:23</p> <p>text 7:24</p> <p>thing 8:24 44:12 45:23 103:5</p> <p>things 8:25 9:25 10:14 12:6, 14, 23 17:25 21:20, 21 23:2 24:16 25:1 27:19 28:18 29:6 30:3 31:6 33:15 34:8 37:21 38:18 41:2 42:16, 19 44:2 50:13 54:19 56:14 57:15 58:10 60:5 63:19 66:1 67:15, 16 69:4, 19 71:6 72:12 73:14</p>	<p>75:10 78:25 83:6 85:21 87:15, 17 90:1 95:16, 24 96:1 98:9, 17 113:25 114:8, 25 116:4 118:21 124:8</p> <p>thinking 86:25 118:25</p> <p>thought 16:9 60:22 70:12, 20 71:15 77:21 100:8</p> <p>three-page 6:21</p> <p>threshold 90:12 91:4</p> <p>throughput 95:19</p> <p>time 4:18 6:9 7:6 8:9, 16 9:18, 19 11:1 14:22 17:8, 12 18:6, 7, 23, 24 19:18 20:11 21:14 22:16 30:16 33:24 36:15, 17 37:8, 15 38:4 42:19 44:14 45:5 48:10, 14, 19 51:15 52:14 54:3 56:18 59:21 60:9, 12 61:10 64:10, 11 65:10, 22, 23 68:2 70:3, 21 73:5, 20 75:14 76:20, 23 77:7 80:10, 11, 14 82:4 83:22 84:20 85:1 88:7 89:11 90:23 91:23 93:12 94:3 95:16 101:16, 21 103:13, 15 106:9 108:15 109:23 112:11, 13, 16 114:22 119:4, 10 121:23 123:16 124:6 125:10 126:6, 7, 10</p> <p>timeline 27:23 41:7 65:14</p>	<p>timeliness 116:15</p> <p>timely 15:17 18:4, 14 41:2 118:17</p> <p>times 15:16 21:17 29:12 35:9 39:21 53:5 84:17 120:18 121:22 123:1</p> <p>timing 19:5</p> <p>title 9:10 49:2</p> <p>today 4:6, 10 32:9, 20 125:10, 13</p> <p>today's 4:13 6:8</p> <p>told 106:16 120:12</p> <p>tolerate 77:21</p> <p>Tom 58:5 68:20</p> <p>tongue 42:5</p> <p>top 25:15 124:15</p> <p>topics 18:12</p> <p>Toronto 21:23 23:23 55:10 64:13</p> <p>touching 71:5</p> <p>tough 89:11</p> <p>track 34:10 36:12, 13 47:13, 15 60:15 69:16 73:10 79:9 88:23 117:2</p> <p>tracking 15:2 25:13 36:18, 20 116:10, 11</p> <p>train 21:22 23:21 24:4 25:22, 23 30:13 31:3, 10 32:2, 23 33:11 34:25 35:23 36:15, 17 37:1, 4, 10 38:5, 16 39:3, 8 44:17, 23 45:11 51:9, 22 55:6, 8, 13 58:23 59:15 60:1 61:16 62:1 66:22 69:8, 23 70:3, 5 71:1, 10, 23 79:24 80:4, 23,</p>
--	--	--	---	--

25 82:3, 11
83:12, 14, 21
84:18 87:21
112:6, 17 118:4,
6 122:6 123:9
trained 15:4
31:5, 6, 12 32:4
82:14
trainers 31:11
32:2, 4, 7, 17
training 14:4, 6
15:8 16:23
18:18, 19 19:4,
7, 8, 11, 15, 19,
22 26:14 31:4
32:1, 7, 9, 18, 19,
25 33:2, 5, 9, 14,
18, 20 34:2, 15,
16, 18, 20 35:2,
5 46:6 51:11,
23 62:2 64:5
69:16 82:22
123:13
trains 21:21
23:12 24:16
25:1 26:15
28:13 30:3, 14
43:4 50:18
51:10 52:2, 3, 4,
5, 8 55:3, 7
58:13, 14 59:20,
23 60:4, 14
61:9, 10, 23, 25
62:12, 16 63:22
64:21, 25 65:22,
24 66:3, 11
67:10 68:25
69:15 70:24
72:1, 3 75:13
79:10, 15, 16
80:1, 8 83:19
84:7, 8 85:11
87:11 88:1
95:17 102:5
104:20 112:4
120:6 122:13
123:7
train-the-trainer
31:2 32:24
33:4, 7
transcribed
4:21 126:12
transcript 4:22
5:1, 5, 10, 11, 14
105:18 126:14

transcripts 41:4,
7 44:2
transformation
24:22 25:7
Transit 4:6
8:10, 15, 19, 23
9:1, 2, 4, 9 10:9
20:22 22:5
23:20 68:16, 17
93:8 94:2
108:11
transition 94:4
Transpo 8:23
13:5, 10 14:20,
23 17:15 19:14,
23 22:9 25:19,
25 27:13 29:4
34:18 35:12
37:19 39:19, 25
43:9, 19 48:15,
18 57:16 61:9,
19 62:22 123:16
Transportation
48:19
Transpo's 16:5,
16 37:24 61:6,
20 63:6
travel 95:16
112:16 121:22
trend 88:15
trending 69:19
trial 5:25 12:17,
21 15:9, 10
16:10 68:24
69:24 70:17
71:2 72:14
74:4, 20 76:9
77:22, 25 78:8
79:17 81:7, 24
83:17 85:13
87:9, 18, 22
88:4, 5 89:16,
19, 25 91:7
92:10, 14, 16, 17,
19, 20, 23, 24
93:3, 14, 23
94:6, 14, 15, 17,
21, 22 95:3, 4, 7,
13 96:8, 20, 23
97:1, 5, 8, 17, 21
99:4, 18, 20
100:18, 20
101:1, 2, 4, 11,
14, 23, 25 102:8,
12, 16, 17, 19

103:11, 21
104:3, 10, 11, 13
105:1, 9 106:13
107:5, 15, 16, 21
108:6, 21
109:12, 17
110:16, 18, 20,
22 111:19, 24
112:18 113:3,
19 115:2, 21
118:8, 14, 20
trickling 42:1
trigger 80:19
triggered 78:21
97:23 103:17
Trillium 10:16
67:6
trips 60:16
95:17
trouble 7:9
troubleshoot
73:13 84:9
troubleshooting
62:16 64:1
65:25 82:23
troubling 30:20
TROY 1:4 2:8
4:2
TRRT 94:14
true 126:13
trying 20:5
22:13 81:11
86:24 109:6
112:22 114:5, 24
tunnel 95:25
114:20
turn 15:7 31:4
92:5
turned 38:23
turning 83:6
TVS 112:13
two-week
123:19
type 23:19
types 41:2
57:15 65:25
72:12 73:14, 17
74:11 75:10
78:25 82:6
83:6 96:1
114:7 118:7
typically 80:22
typos 5:10

< U >
U/T 3:3 100:17
ultimately 12:21
15:22 29:15
30:16 44:9
48:1, 5 60:18
61:18 72:13
76:22 78:8
79:5 85:12
88:3 92:1
96:24 102:8
103:5 104:15
105:25 115:9
123:1
uncover 66:16
understand 8:8
37:16, 18, 19
43:10, 20 44:18
45:20 51:3
57:22 62:21
66:2 79:15
81:11 82:10
83:17 85:15
86:19 96:10
97:7 98:20
102:21 110:2, 4
121:8
understanding
63:10 66:20
73:8 102:15
107:14 111:3
120:9
understood
29:24 67:2
undertaken 3:3
57:22
undertaking
100:16
UNDERTAKINGS
3:1
unexpected
28:20
unfolded 110:2
Unfortunately
42:13
union 26:10
unionised 26:9
unit 19:11
34:18
update 8:4
33:23
updated 7:5, 7
updates 33:12
35:3 59:25
60:2 66:23

69:7 74:7, 9
75:9 82:6
84:17, 18, 19
85:15, 17, 21, 25
86:3, 7, 12 88:3
updating 7:15
8:5 64:2
ups 110:18
upwards 93:1
95:20
Urguhart 2:11
Urquhart 2:9
usage 21:20
useful 27:19
uses 34:10
utilize 21:15
utilized 116:10
117:5
utilizing 56:15,
17
< V >
valuable 63:19
value 41:16
Vancouver 24:2,
3 55:5
variety 13:23
34:1 70:7
various 15:23
47:13 49:12
51:21 57:12
64:14 74:11
75:9 88:24
102:24 111:22
112:14, 15
vary 36:23
vehicle 37:9
45:11 64:9, 10
66:24 67:8, 14,
16 77:5 87:14,
15 116:3
117:16, 18, 21
118:2
vehicles 23:10
47:15 50:22, 23
51:1, 16 54:21
57:23 62:16
65:6, 7 69:3, 14
73:10, 13 74:6
75:19 78:11, 24
79:3, 8, 22 80:6,
11, 14, 18 82:21
84:21 86:10, 11
116:2 117:25

ventilation 95:25 114:21
verbal 44:1
versus 13:11
verus 124:24
vetting 73:1, 2, 3, 25 74:25 75:3 76:9 77:15
video 44:2 45:25
Videoconferencing 1:8
view 28:11 76:10 79:14
Virtual 2:17 125:12
visit 21:6, 9
Vogel 2:10, 12
volume 7:10 57:14

< W >
wanted 8:4 23:11, 15 32:10, 22 102:22, 25 113:5, 6 116:7, 17, 20 117:6 120:24
Wardle 2:9 31:19 53:13 94:16 100:5, 9 104:23 107:2, 12 109:4, 14
wealth 23:24
wear 55:18, 25 56:6
weather 59:6
webs 114:11
website 5:2
weekday 123:24 124:1
weekend 123:24, 25 124:6
weekly 47:20
weeks 123:17 124:17
whistles 122:12
winter 60:8, 19, 23 71:15, 20
wire 55:7, 8, 13, 14
witness 5:17, 20, 23 53:14 104:24 107:13 109:12 126:7, 9

wonder 29:18 31:19
wondering 88:11 107:8
won't 38:14 40:5
word 11:9 115:3
work 7:16 9:16 10:8, 19 11:15, 19 14:19, 21 17:8 22:25 47:4 48:2 50:19 54:2 57:25 63:2, 11 68:2, 4 70:18 86:9, 20, 22 94:1 97:9 102:18 114:15 115:3, 5 116:8, 9, 23 120:23 121:12 125:12
worked 21:2 30:10, 14, 18 34:5 35:25 41:11 49:5 51:18 57:8 58:5 93:24 95:13 98:20 123:22
workforce 12:1 26:9 73:12 117:4
working 11:16 13:17, 21, 23 14:15 21:16 24:8 28:24, 25 29:8 30:10, 19 52:16 56:20 57:2, 18 64:1 68:9 76:13, 15, 17 77:12 86:6 92:3 93:19 115:16 119:4
works 34:25
world 75:23
worth 68:10
writing 57:10
written 43:25
wrong 39:4 90:1

< Y >
yard 61:17 79:3

Yeah 9:10 13:1 15:14, 20 16:7 18:24 22:15 24:18 28:10 30:9 42:3 44:20 49:23 62:9 65:18 78:25 85:20 86:8 90:12 97:10 102:20 105:25 108:23 114:13 118:13 119:11
year 15:19 33:19 64:25 93:2
years 7:16 11:22 21:2 68:10 86:11, 18 89:2 121:20 123:12

< Z >
Zach 2:11
Zoom 1:8